ISSN: 1130-3743

EDUCATION, CORPOREALITY AND THE EVOLUTION TOWARDS DIGITAL LEARNING. A «STIEGLERIAN» PERSPECTIVE

Educación, corporalidad y la evolución hacia un aprendizaje digital. Una perspectiva «stiegleriana»

Éducation, corporéité et l'évolution vers l'apprentissage numérique. Une approche «stiegleriene»

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Fecha de recepción: marzo de 2011
Fecha de aceptación definitiva: julio de 2011
Biblid [(1130-3743) 23, 2-2011, 129-150]

RESUMEN

En este artículo se exploran algunas perspectivas filosóficas en referencia a la evolución actual de las prácticas educativas tradicionales, en el contexto de clase y de grupo, hacia actividades de aprendizaje en entornos digitales. En particular, dirigimos nuestra atención hacia la dimensión corporal en esta evolución. De manera general, los debates sobre el tema se desarrollan en términos de la ausencia o de lo obsoleto del cuerpo físico. Sin embargo, nosotros abogamos por un nuevo enfoque a este tema, tomando en cuenta los aportes del filósofo francés Bernard Stiegler. Él mismo ha desarrollado un enfoque que se centra totalmente en la tecnología, el cual nos permite analizar la construcción de la subjetividad en relación a un contingente histórico material y de prácticas corporales asociadas (las cuales funcionan como

un tipo de memoria externa, en un sentido original). Este enfoque en particular nos permite desarrollar un análisis específico en relación a la escuela entendida como un dispositivo material que forma la atención a través de prácticas concretas, tales como la escritura o la realización de tareas. A pesar de que Stiegler no se presenta totalmente consistente en el seguimiento de sus propias hipótesis «materialistas», de todas maneras, apelamos a una línea de investigación «stiegleriana» que nos permita dilucidar el significado de la realidad de la educación contemporánea, sea esta tradicional o virtual, omitiendo una perspectiva normativa (es decir, en la abstención de una pronunciación o aclamación directa de una [r]evolución digital).

Palabras clave: el cuerpo en el aprendizaje y la enseñanza, la digitalización, interacción en línea, Stiegler, subjetivación, historia de la tecnología, retenciones terciarias, escritura, el ejercicio, las prácticas escolares.

SUMMARY

In this article we explore some philosophical perspectives on the current shift from traditional forms of class and group teaching to learning activities in digital environments. Our interest goes more precisely to the corporeal dimensions of this evolution. Showing that as a rule the issue at hand is discussed about in terms of the absence or obsoleteness of the body, we argue for the introduction of a new approach, that draws from the insights of the French philosopher Bernard Stiegler. He has developed a fully technology-centred approach that analyzes subject-formation in relation to a contingent history of material tools and related embodied practices (which function as a kind of external memory support in an original sense). This particular approach allows for concrete analyses that show the school to be a material dispositive of attention related to concrete practices such as writing or exercising. Although Stiegler is in the end not entirely consistent in following his own «materialist» assumptions, we will argue for a «Stieglerian» line of research that allows to fathom the meaning of today's (traditional) and tomorrow's (digital) educational reality, omitting a normative perspective (i.e. refraining from directly denouncing or acclaiming the digital [r]evolution at hand).

Key words: the body in learning and teaching, digitalization, on line interaction, Stiegler, subjectivation, history of technology, tertiary retentions, writing, exercising, school practices.

SOMMAIRE

Dans cet article, nous explorons quelques perspectives philosophiques sur l'évolution actuelle des formes traditionnelles d'enseignement en classe et de groupe à des activités d'apprentissage dans les environnements numériques. Notre intérêt va plus précisément à la dimension corporelle de cette évolution. Nous montrons que, en règle générale, la question qui se pose est discuté en termes d'absence ou d'obsolescence du corps. Nous proposons, au contraire, de développer une nouvelle

approche, qui est basée sur les idées du philosophe français Bernard Stiegler. Il a développé une approche qui est totalement centrée sur la technologie et selon laquelle la construction de la subjectivité est dépendante sur une histoire contingente des outils matériels et des pratiques associées incarnées (qui fonctionnent comme une sorte de support de mémoire externe dans un sens original). Cette perspective particulière permet des analyses concrètes qui montrent que l'école est un dispositif matériel qui forme l'attention par des pratiques concrètes, telles que l'écriture ou l'exercice. Mais, parce que finalement Stiegler n'est pas conséquent dans le développement de ses hypothèses «matérialistes», nous allons plaider pour une ligne de recherche «stieglerienne» qui permet de comprendre mieux la réalité éducative contemporaine, qu'elle soit traditionnelle ou virtuelle, en omettant entièrement une perspective normative (ie en s'abstenant de dénoncer ou acclamant directement le [r]évolution digitale).

Mots clés: le corps dans l'apprentissage et l'enseignement, numérisation, interaction internaute, Stiegler, subjectivation, l'histoire de la technologie, rétentions tertiaires, écriture, l'exercice, les pratiques scolaires.

In this article we want to explore some philosophical perspectives on the evolution that is currently taking place from traditional forms of class and group teaching (in schools and universities) towards learning activities in digital environments. Whereas formal education has more or less always been a matter of face to face instruction, implying that pupils or students were gathered in especially equipped spaces in order to be taught by (authoritative) professionals, there is today a growing tendency to organize education «on line», i.e. in such a way that students stay at home and are as a rule working on an individual basis and are carrying out tasks that are prescribed and monitored by or via computer programs (which is of course not excluding the possibility of group-work, nor the frequent interaction with peers and teachers) (Hiltz & Turoff, 2005). Up till now, this evolution had mostly major implications for higher education, but it is expected that in the (near) future it will affect the sphere of education generally and that it therefore might have serious consequences for the way in which the raising of new generations is to be organized and living together is to be structured. This evolution towards digital learning is moreover in line with broader societal changes, which Manuel Castells (1997) analyzes as the coming-into-being of a «network-society», which profoundly changes our self-understanding, as well as what it means to live together – in view of the disappearance of direct corporally mediated (face to face) contact or spatio-temporal restrictions that used to determine the scale and depth of human interaction (cf. Wellman, 2001).

Although the digital (r)evolution might be explored from a great variety of perspectives, we will explicitly focus in this article upon *corporeal* dimensions of this process. Assuming that learning and teaching have always been strongly embodied practices, my interest goes to the question if and to what extent the digitalization of education affects the role that the human body plays in education.

It is tempting, as we will try to show in the first part of this article, to narrow down this question as being about *whether or not* the body has become redundant in cyberspace: this is to say that the shift towards e-learning is mostly dealt with in terms of the presence or absence of the body of the on-line student (and teacher), which is thereupon assessed in view of an idea of what education should essentially consist in. To such a line of thinking it is often the case either that digital forms of education are execrated, because it is believed that direct body to body interaction, which is obviously lacking, is in itself educationally relevant. Or the absence of the possibility of such interaction is precisely acclaimed for granting new and rich opportunities for realizing important educational goals. Furthermore, defenders of this latter position will often try to show that the body is never *really* absent on line: digital learning, so it is argued, still involves the body but in a different way than it used to.

In the following sections, we will try to show that this discussion might take a new turn by bringing into play some ideas of the French philosopher Bernard Stiegler. His technology-centered approach allows conceiving the relation between education, embodiment and digitalization in unforeseen ways: to Stiegler our particular existence as human beings is in a radical sense dependent upon the use of technologies (which comprise material objects as well as embodied practices related to them) and upon educational milieus that essentially consist in the formation of attention. We will try to show throughout this article that a Steiglerian approach allows a way to transcend the existing discussion whether or not the body has become obsolete, and to leave behind the tendency to judge technological evolutions from a standpoint that resides *outside* concrete techno-educational reality.

We will however, in the last part of this article, also argue that Stiegler's promising view on this issue should be criticized for not being entirely consequent: as we will try to substantiate, he also ambiguously embraces a traditionalist approach towards changes in the current educational sphere, which is in the end inconsistent with the materialist and technological turn he advocates. Therefore, the main objective of this article consists in exploring what it means to follow the Stieglerian path all the way down. In this way we hope to give a new impetus to the research regarding the relationship between education, corporeality and digitalization.

1. The «absence» of the body in digital learning

The shift from traditional body-to-body pedagogy to digital learning, which renders actual corporal presence between various actors redundant, might be acclaimed for many reasons. For instance, the anonymous nature of virtual environments might be praised, because on line interactions decrease the possibility that bodily characteristics which in traditional pedagogical situations hinder real participation or equal opportunities for self-development, such as physical disability

or skin colour, play a role (Land, 2004). Digitalized contexts might moreover allow for new forms of community and for a deepened ethical awareness, as members of on-line-communities are often confronted with the request to engage with people they often don't know anything about, leaving chances to develop an attitude of unconditional hospitality (Lander, 2005). And, elaborating the idea (in a perhaps extreme way) that the main concern of education should be the disinterested acquisition of knowledge, it might be defended that the presence of insistent features such as good looks or body odour, and dimensions such as facial expression or vocal timbre, which always go together with face-to-face interaction, divert us from what teachers and students should be concerned about. Digital learning on the other hand grants more possibility to keep one's mind fully concentrated on the subject matter. Corporeal presence is, especially in academic contexts, not only irrelevant, but counts as a nuisance: true education should constitute, so to speak, a practice that is as far as it is possible disembodied (Blake, 2000).

It might also be considered that for e-learners it is no longer necessary to get dressed every morning and to face cold weather, snow or an overcrowded bus service, in order to get to school. However, the benefits that this «absence of the body» grants might also be criticized, as the vanishing of the need to be constantly moving between home and school rules out at the same time important dimensions of (social) reality, which should also matter in *any* educational situation –in this case: learning to deal with all kinds of unpredictability and discomfort that are related to the fact that we are not living alone in the world. It becomes moreover possible that participants of an e-learning community never notice the passing away of some member and aren't any more confronted with this inevitable dimension of the real life-world, viz. the fact that people might suddenly die.

In his book *On the Internet*, Herbert Dreyfus (2001) pursues a similar line of criticism, but on a deeper level: he argues that digital learning not only implies the loss or exclusion of certain educational relevant experiences, but that it concerns an activity that can never be *educational itself*. For Dreyfus «digital learning» and «education» are mutually exclusive realities, and – so he claims – the massive implementation of new media (at the expense of traditional class or college instruction), will destroy what is at stake in *genuine* education. Dreyfus's harsh criticism is based on his interpretation of Merleau-Ponty's (1996) conception of the body as constitutive for all meaningful activity. Going against a long standing tradition in western philosophy which privileged the life of mind as the dominant source of meaning over and against the «merely corporeal», Merleau-Ponty shows that our embodied relation with the world and with others preconditions the meaning of everything we do, even if it concerns the deployment of intellectual capacities: abstract concepts such as density, elasticity and viscosity are only possible to conceive because we first had very concrete bodily experiences (e.g. kneading bread dough) and not the other way around. What we actually (might) do and experience as the bodies that we are (rather than have) is constitutive vis-à-vis any meaningful phenomenon. We count up to ten (and not to sixteen which

happens in the hexadecimal numeral system and which, on purely mathematical grounds, is far more efficient than the decimal system we are inclined to use), because we have *ten* fingers: this «abstract» activity finds its roots in the practical embodied practice of counting on one's fingers – and more generally it might be said that the sense of what mathematicians do is preconditioned by a more original corporeal intentionality (cf. Sheets-Johnstone, 1990).

Analogously, the meaning of the very activity «learning» is firmly rooted in what we experience at a corporeal level. Elaborating this Merleau-Pontian perspective, Dreyfus argues that the being together of students, teachers and subject matter in a strong physical sense, i.e. at the same place, constitutes a necessary condition for education to take place. This is because we can only learn to master a subject, Dreyfus argues, when this subject matter is *sensed* as having a reality of its own, i.e. when we (as bodies) are confronted with something external that poses a challenge to us and that doesn't automatically yield to our will and intention. Learning requires a subject that is *only* mastered *after* a long, demanding and at times frustrating period of study. Therefore it should be literally *present*. For Dreyfus the indirect and hyper-mediated relation to reality within virtual spaces, as well as the ready-made and algorithmic character of e-learning-programs prevents this confrontation with a recalcitrant reality. These programs are developed as it were to immunize pupils/students against this kind of unsettling experience. In the same line Dreyfus argues that pupils or students are in need of the presence of a master who can ask at any time the learner (which is in this view seen as an apprentice) to answer difficult questions or to demonstrate her knowledge and skill, with the risk of experiencing not as yet to be in possession of the knowledge or skill that is being required – a precondition of education that is lacking when the world and others are merely *telepresent* (instead of being physically present). In sum, for Dreyfus, e-learning should be criticized because it substitutes a false feeling of being engaged with a world and others for the possibility of a world and others to be *truly* present. And so a direct and unmediated encounter with reality that is constitutive for education to happen is ruled out: disembodied minds that are solely an extension of the internet cannot be properly «educated» any longer[1].

Dreyfus's extensive analysis might be countered by taking into consideration that there exist phenomena typical for the use of digital media, which are also

1. Dreyfus' analysis could be linked to a broader criticism regarding the neglect and suppression which the body suffers in western culture. It could be claimed that the praise of the implementation of digital technologies is just the newest form of Cartesian dualism (LE BRETON, 2002) or even «biotechnological theology» (MURI, 2003): the interest in virtual reality bears witness, according to these authors, to a deep hatred for the uncontrollable and limiting dimensions of existence that are connected to human embodiment. In that sense the evolution towards e-learning is on a par with the (perhaps realizable) dream of the so called *extropian* movement to detach ourselves one day from our corporeal and transient bodies and to reach a dematerialized and immortal life as mere computational realities.

experiences of the recalcitrance of reality, e.g.: getting lost in an abundance of information or being confronted with slowly loading web-pages (Rosenberger, 2007). What interests us here, however, is the role human embodiment *as such* plays when discussing education in the context of the process of digitalization. Therefore we turn to some thoughts of Nick Burbules (2004), which might be read as a comment on the kind of arguments Dreyfus develops and which expose them as uncritically presupposing that the body is not present or directly involved when one is learning in a digital way.

Even if the whole opposition between *true presence* of reality (and others) on the one hand and *telepresence* on the other might intuitively sound correct, Burbules argues that is in fact erroneous: this is because mankind has *always* lived some kind of «virtual» existence – in the sense that (wo)man has always been dependent upon devices and that all meaning is technologically *mediated* and constructed in some way or another. This implies that the implementation of new technologies can never be judged as inherently good or bad. Therefore we should, so Burbules argues, find a relevant criterion to assess the technologies used, such as the possibility of *immersion* into reality which they offer. Introducing this criterion, Burbules points out that whether one is attending a traditional university course, physically gathered as students in the so called real environment of the college room, face to face confronted with a lecturer who is made of flesh and bone, or whether one studies the same contents on line, what happens should be only assessed from the viewpoint of what opportunities it creates for discovering new things of interest, for becoming involved with the matter at hand, for stimulating talents and imagination, etc. When a student is «immersed», this means that he/she becomes attentive for something that really matters, that makes one see things that were hidden from attention before, that stimulates to explore unforeseen paths, etc. Immersion is thus a quality of an experience that exists independently from the way in which this experience is generated, i.e. whether the object of interest is *present* or *telepresent*. Considered from that point of view, e-learning can sometimes be a more immersive medium than schooling as we have known it for the past two (or three) centuries is. Furthermore, the experience of immersion *always* presupposes embodiment: it requires a physically sensed attention for the thing of interest. We must feel, Burbules argues, *as bodies* to be focused upon the subject matter, to be passionately excited by and carried away with it and, sometimes, to have forgotten ourselves to so such an extent, that we happen to find ourselves completely worn out in the end. Therefore, the evolution from body-to-body teaching towards virtual learning does not necessarily constitute a qualitative breach: digital forms of education *still* might involve the body as a source of meaning in relevant ways. The evolution at hand should be seen as merely a variation of educational environment and should therefore be assessed in view of the very standards that always have been conceived as characteristics of valuable ways of learning and teaching, viz. the opportunities for immersion that are being granted. Digital learning and education are not necessarily mutually exclusive realities. Consequentially there is no reason whatsoever to agree with the criticisms Dreyfus brought forward.

2. TECHNIQUE, EXTERIORIZATION AND INDIVIDUATION: A STIEGLERIAN PERSPECTIVE

Up till now we have dealt with the way in which the issue of the digitalization of education is commonly being discussed about, in view of the idea that this evolution might have an impact on the role the body plays in teaching and learning: whereas some argue that the body and body-related experiences become absent or redundant in digital learning contexts, jeopardizing what is at stake in education, others will precisely reply that the body is always, though perhaps in an alternative way, implied when education takes place on line and that the corporeal dimensions that were relevant for traditional teaching and learning still matter. In this section we turn to the work of Bernard Stiegler, because we think that he introduces an original point of view in this debate. Stiegler takes it for granted that *all* meaningful human activity is *fundamentally* intertwined with and only made possible due to the use of technique (i.e. relying on prosthetic or artificial extensions of the body). Inspired by Simondon (1958), Foucault (1977) and Gille (1977), Stiegler defends the idea that there is no such thing as a foundational subjectivity behind the various historical appearances of (wo)mankind, but that there exist only contingent forms of subjectivation (or «individuation») and that these (to a smaller or larger degree) resulted from the development and common implementation of (continually changing) techniques[2]. This perspective, which consists in trying to understand the human condition as an entirely technological condition, has the benefit of leaving behind any technophobia whatsoever. It also means that Stiegler concurs with the Merleau-Pontian claim that we *are* our body, without however following Dreyfus' line of techno-criticism. Moreover, instead of starting from a normative idea about education (and the role the body should play in it) in view of which technological evolutions should be assessed – which is essentially Burbules' standpoint –, Stiegler's project consists in analyzing education from the perspective of the contingencies of subject-formation: he takes

2. Perhaps our reading of Stiegler is atypical, because his most recent oeuvre is often understood as a critique on Foucault's view of modern societal regime (cf. LEMMENS, 2009). To Foucault modern power technologies envisage the individual body – managing society on the basis of corporeal (self-) discipline, guaranteeing in this way the availability of bodily energy for efficient use: life is made *productive*. Stiegler however defends in his recent work the view that the specificity of the current situation can only be understood when analyzing societal regimes no longer in terms of foucaultian «biopower» (controlling embodied life), but in terms of «psychopower» (controlling the mind). This concerns a regime that seizes individual consciousness and desire in order to turn people into mindless and uncritical *consumers* (rather than into productive labour-power). So, subjectivation seems to take place today on a level that transcends the physical. Therefore it might be believed that Stiegler moves away from the materialist view of (wo)mankind he pursued in his earlier work. We believe however that it still is possible to interpret his more recent oeuvre and his analysis regarding «psychopower» as a further elaboration of his earlier arguments: this is to say that the way in which «psychopower» works is to be understood using the views Stiegler developed in his earlier work, where he unambiguously endorsed a fully materialist perspective.

educational reality *itself* to form part of a materially constituted and technologically mediated history, and does not deal with it as an isolated concept to be used for judging this history (of tools and bodies). This implies that to Stiegler immersion or attention cannot be seen as independent from concrete techniques – contrary to what Burbules presupposes.

Therefore it is worthwhile first to have a closer look at Stiegler's broader theoretical framework. To him, subjectivity is not something that is always already there, but something that is continuously produced in relation with what he calls «accidental» circumstances. This is to say that if we had met with other technological conditions in the past, we would have been different creatures today. So, going against the idea, one may encounter in many manuals of history, that (wo)man, when (s)he finally achieved the technical tools and skills to domesticate plants and animals somewhere around 10.000 BC, realized a step forward in the ongoing and gradual development of mankind, the story could be told the other way around (cf. Deleuze & Guattari, 2004): perhaps it is more adequate to say that plants and animals domesticated (wo)mankind. This is because from this moment on (wo) man had to reside permanently at one and the same location, to live together with a larger group on a small surface, to spend all his/her time and energy in solving agricultural problems dealing with optimization of harvest, etc. These changes implied new ways to relate to ourselves, viz.: we became members of a community in which we had to behave in a civilized way, as well as individuals that had to be concerned not only with the present, but that were above all focused on the outcomes of our actions in a distant future.

Otherwise stated: perhaps it shouldn't be contended that (wo)mankind invented domestication, but that this particular technique invented a particular form of (wo)mankind. Now, Stiegler makes an even stronger claim, going all the way back to the origin of the human species, arguing that the contingent invention of «lithotechnique» (i.e. the use of stone tools, which first took place in the era in which the species *Australopithecus* evolved into the so called *Homo neanderthalensis*) marked the threshold between animal and (wo)man. *Humans were invented by tools*. To understand the idea that technical extensions of the body determine *what we are* as human beings, it might be useful to consider Stiegler's related thesis concerning the *original exteriorization of life* (Stiegler, 2006, 46-47) – which we will elaborate here in three steps.

First, developing some ideas of the paleoanthropologist Leroi-Gourhan, Stiegler claims that human being is the only species the evolution of which is not to be explained by *interior*, i.e. biological factors (Stiegler, 1994, 135). This is because there exist as good as no differences between the first humans and us today as far as physical and genetic features are concerned: we share for instance exactly the same neurological hardware (i.e. the same amount of brain tissue and especially the same number of [prefrontal] cortical neurons). At birth we are the same, so to speak. Therefore, the space of all further evolution is to be found in the *exterior* milieu, and more precisely in the development of new and more complex prostheses (wo)man continually relies on.

Second, going against the usual meaning of this word, Stiegler asks his readers to conceive a kind of exteriorization that is not presupposing an already existing interiority. This exteriorization began, not because it was steered by or craved for by an internal milieu, but as a result of contingent conditions (the upright posture, the emancipation of the hand for new uses, the increase in brain tissue, etc.) which made the very use of instruments possible. So, interiority arose *only* as the counterpart of the coming into being of a register of behavior that was projected towards the outside, and the self-conscious and intentional life of mind came into existence as a corollary to a new mode of «being in the world», that in contradistinction to other, non-human forms of life relied on the use of technical prostheses[3].

Third, the thesis that human existence is exteriorized implies on the one hand that *the sort of* techniques which gave shape to human existence is a matter of coincidence: as we indicated, (wo)mankind could have been a completely different creature if the «lithotechnical» revolution would never have occurred. The idea that all *anthropogenesis* is fundamentally *technogenesis* (Lemmens, 2008, 474) implies that (wo)man has no definite essence. But, on the other hand, this also implies that human kind possesses nevertheless one essential feature: what it means to be human is *always* preconditioned by the use of technical prostheses. Although *the nature of* the particular techniques that give shape to existence is a contingent matter, *the fact that* we always use them (or else would cease to be human) is a fundamental (and the *sole* fundamental) dimension of what it means to be human (*op. cit.*, 398).

Now, in one way or another, the techniques that play this constitutive role in the process of subjectivation or «individuation» (as Stiegler calls it himself, referring to Simondon) always function as a kind of *external or artificial memory*. This is to say that knowledge and skill that belonged to former generations are preserved, accumulated and further developed in concrete material objects, to which Stiegler also refers as «hypomnemata» (a terminology coined by Plato). A stone tool, but for the same matter a chair, a pair of compasses, a fountain pen or a cell phone, constitute a materially based memory support («support de mémoire») that precedes

3. Another source of inspiration to the eclectic Stieglerian philosophy is phenomenology and especially Heidegger's analysis of human existence (stating that the particular *human* way of being, *Dasein*, resides in an openness to the world, an openness which is more original than the opposition between subjectivity and objectivity, and which calls these two poles into being in the first place). Obviously, Stiegler does *not* share Heidegger's *one-sided* execration of technology: whereas Heidegger sees technology as an immunization strategy against the burden of freedom (or lack of essence) which *Dasein* essentially is (human's essence being the lack of all possible essence), Stiegler argues that technology, as it is foundational vis-à-vis what we are as *human* beings, grants this freedom in the first place (STIEGLER, 2004, 45). Moreover, Stiegler, being a direct disciple of Derrida, defines his own project as an attempt to think *beyond* the typical western («metaphysical») prejudice to ignore the constitutive role of technologies, such as writing (a practice which we will explore further on in this article).

and gives rise to the existence of individuated subjects. So our singular existence is dependent upon a technical milieu that *transcends* us and that works as a larger cultural memory[4]. Stiegler argues (following once more Simondon on this point) furthermore that all individuation at a personal level (to which Simondon refers a bit unfortunately as the «psychological» level), is *at the same time* a collective form of individuation. So, this last terminology should not be reserved for the individual reality alone. Because the coming into being of the singular existence of any *human* being is by definition mediated by a technical heritage the existence of which is only guaranteed at a trans-individual level, it follows that the process of individuation always implies a reference to a social dimension: more precisely, we become but who we are against the background of the *succession of generations*. Individuation is simultaneously a personal *and* a collective matter. Or: technogenesis is simultaneously anthropo- *and* sociogenesis.

In order to elaborate this idea further, Stiegler has recourse to Husserl's notion of «tertiary retentions». Retention, as Husserl (1928) defines it, is not the same as mere recollection of past experiences, but refers to a structural dimension of *all* states of consciousness: the meaning of actual experience refers *necessarily* to past experience. There is never a «pure» experience of the «now», as any state of consciousness in the present is *always* partly constituted by former states of consciousness that transcend this «now». The first time we spend a whole hour in a waiting room attending a visit to a physician, we might find this an extremely boring experience that seems never to come to an end. However, after frequently going through the same experience, we get accustomed to this nuisance. Therefore the nature of our experience is changed by former experiences: time passes by, even if it concerns scientifically considered exactly the same period of time. We still wait for an hour or so, but it doesn't feel the same. Paradoxically as it might seem, *the past is present*, as it colors our experience of what currently happens.

Now, Husserl, focusing on primary and secondary retentions, examined mostly the way in which past experience determines present experience *at an individual level*. Whereas *primary* retentions concern actually sensed experience (e.g.: when reading a word on this page, one always takes into consideration the words just read as a kind of horizon that gives the word in question its particular meaning), *secondary* retentions concern past experiences that are not directly accessible (e.g.: when reading this text, one necessarily takes into consideration texts one has read before, e.g. articles dealing with the same subject). Stiegler wants to extend this perspective and especially elaborates further a dimension Husserl only discussed superficially (Stiegler, 2006, 84): that the very meaning of conscious phenomena is *also* dependent upon material and prosthetic conditions,

4. Stiegler calls this milieu also «exophylogenetic», indicating that it concerns here a kind of heritage that exceeds our internal (or «endophylogentic»), i.e. genetic memory.

that lie *before* and *beyond* individual consciousness, and which should be termed *tertiary* retentions[5].

What this means might be illustrated again by a reflection on the phenomenon of reading. The contingent invention (in the second half of the 12th Century) of a text format with page numbers, titles, paragraphs, spacing, punctuation marks, etc. granted a kind of reading that was impossible to imagine before[6]. Formerly, manuscripts consisted in unbroken sequences of words: there was no page lay-out whatsoever and the only marks that existed were meant to indicate how to recite the text. Up till then texts were almost exclusively meant to be read aloud: texts were above all *heard*, rather than being *read* in the sense that we today understand this expression: it could be said that the book *as an optical object* did not exist *before* these particular inventions. Thus, the invention of a new text editing technique made for the first time possible «the art of reading» properly (in silence, at a slow pace, with the possibility of retaking a passage, scrolling through the text, making cross references, critically reflecting upon it, etc.). So, a concrete material medium, viz. a readable text-format, is responsible for the shaping of a specific kind of consciousness. Or phrased in another way: a mode of *attentiveness* that we perhaps find evident today is the corollary of particular prostheses that were invented and implemented at a given time. To make an even stronger claim, the creation of a new technique produced a specific kind of subjectivity. Making use of this particular and contingent «retentional dispositive» (wo)man becomes «individuated» in a way different than in, say, Roman Antiquity[7].

Now, even if this kind of «external», i.e. material and prosthetic, support concerns an artificial reality that is neither biological, nor psychological, it is nevertheless as indispensible and original as genetic determinants or the structuring principles of consciousness (i.e. primary and secondary retentions) are (Lemmens, 2008, 402). This «tertiary», artificial memory is in fact even more important (as it grants the very possibility of primary and secondary retentions in the first place).

5. The reason why Stiegler is interested into tertiary retentions, i.e. into something that lies outside the consciousness and that is in a sense absent or *unconscious*, has also to do with another source of inspiration of his thought, viz.: psychoanalysis. We have however no space here to go deeper into this connection.

6. The example we use is taken from ILLICH (1993). STIEGLER (2008, 232) elaborates a similar example, discussing the invention of book print in the late 15th Century. However, Stiegler does not give an analysis that is as detailed as Illich's. Nevertheless, we believe the kind of analysis Illich presents is much in the Stieglerian spirit. Moreover, taking seriously the idea that techniques are the steering factor behind subjectivation, the invention of lay-out, punctuation marks, etc. is ultimately of a greater importance than printing.

7. ILLICH *(op. cit.)* makes the same claim when speaking in this context about the rise of the *homo textualis*, which has a completely new form of self-understanding (implying from now on e.g. that one can «read» and «study» one's mind as one does with a book or that one values the self for being original, in the way that authors of books are praised for).

To grasp this idea to the full, a common way of thinking about technology, which is related to the traditional view of the subject as the ultimate source of meaning, should be left behind. If reality is to be understood from the standpoint of such a subject, it is perhaps difficult to see why a stone axe or a typewriter should be called a memory of its own kind: the most charitable interpretation of Stiegler's philosophy would then consist in accepting that we only call these tools a kind of memory in a metaphorical sense. However, what Stiegler asks his readers to imagine is to see it the other way around: trying to understand reality from the standpoint of technique, these tools should be called memory *in an original sense*. This would imply that what is generally understood under the notion memory (a *mental* act, a *conscious* relation to the past) is only secondary to the *prosthetic* milieu that is *itself* a memory[8].

Stiegler developed this provocative idea whilst engaging in critical dialogue with Plato, who himself execrated all «hypomnemata» as distracting (wo)man from real knowledge – which is for Plato to be found in the intuition and remembrance of things («anamnesis») that relied hidden somewhere deep in us, but that we had forgotten to possess. However, the very example Plato uses as an argument in favor of his theory ironically supports Stiegler's own view: the famous slave who is being questioned by the philosopher regarding a mathematical problem, «remembers» the right answer and gets enlightened *only* when he is asked to draw a square in the sand before him and subdivide it by physically drawing perpendicular and diagonal lines (forming a rhomb that is exactly half the surface of the original figure). He gains geometrical insight, only by way of «exteriorization». This underlines the importance of an original, external memory: that what makes geometrical knowledge possible is in fact *a priori* given (as Plato claims), but not as something internal to the mind (inborn ideas), though precisely as an external memory support (*pace* Plato).

Perhaps it is important to make a last remark about Stiegler's philosophical position. The stress he puts on the importance of pre-existing, trans-individual and collective memory supports that we owe to previous generations might give the false impression that he defends a kind of sterile communitarian conservatism. However, Stiegler also emphasizes that the (prosthetically mediated) coming into being of singular individuals (or for that matter singular social entities that are implied simultaneously) refers to a process that never comes to an end. Consequentially he never speaks about individuals, but only about «processes of individuation». So, what is stake is above all the possibility of the coming into being of the new, i.e.: offering opportunity to the new generation to transform the world (against the background of a preserved old one). This means that the «adoption» of

8. «Support de mémoire» should therefore be understood, not as a support to memory (as usually conceived), though as a memory support (a memory itself that is supportive to the ongoing process of individuation).

a heritage and a «programmation» on the basis of what is already existing constitutes the very precondition of real freedom and transformation –which should also be called «deprogrammation» (Stiegler, 2008, 177). Of course, Stiegler's concerns on this point, which – as the title of one of his latest books *(op. cit.)* indicates – consist in «taking care of the generations» (2008), are close to those of Hannah Arendt (1958).

3. The school as a tertiary dispositive and the dangers of digitalization

It is possible now to return to the central concern of this article: the relation between the body, digitalization and education. To Stiegler, the institutionalized form of education that takes place in schools, is of the greatest importance. First, schools function as places where «retentional programs» are «incorporated». This «embodiment» takes place through concrete *techniques of attention*. But from the very beginning, i.e. the time of Plato and the Sophists, the school has constantly been «at war» with rival apparatuses that try to capture (rather than form) attention. These inimical powers are, as Stiegler puts it, soaking up «available brain-time» («du temps de cerveau disponible», See: Stiegler, 2010) in order to gain control over the way in which tertiary retentions shape subjectivity. Stiegler also speaks about «psychopower», when referring to those regimes that take advantage of the prosthetic basis on which *all* processes of individuation are engrafted. The danger here is that real individuation becomes impossible: psychotechnologies generate mindless herds that are totally deprived of any critical sense. The sophists of our days, however, are no longer malignant rhetoricians that make a lucrative commerce out of the art of the spoken word, but concern the so called «cultural industries»: these exert (psycho)power by monopolizing attentiveness through the use of «psycho-technologies», such as television, videogames and the internet (at least when this medium is used in a conformist and consumerist way). The school is therefore always involved in a «battle for available brain-time» and is always a factor of political relevance (Stiegler *et al.*, 2009, 77). Second, the institution *school* is a very specific invention which is, so Stiegler claims, typical for western culture and is thus to be distinguished from other institutions that initiate young people into society (such as the family or non-scholarly socialization apparatuses).

> It might seem pointless to recall to memory this fact, which nevertheless deserves to be recalled and thought over again: there is no school before the practice of writing and reading. Mere processes of transition or initiation are not in themselves schoolish. This is to say that the school ceases to exist when writing and reading loose their position, when writing and reading have become just one set of retentional technologies next to many others […] Writing and reading, as far as it regards techniques that I embody, are before anything else a gestural mechanics, and the school is before anything else a bodily discipline in this respect. The schooling of bodies is not only concerned with learning to sit still for one or two hours, it is

> also concerned with learning to sit still in order to draw (*graphein*, which is the origin of *gramma*): to leave behind traces, as well as generating them. It is also concerned with learning to sit still when listening attentively: the school is a school of attention. Societies without schools don't allow for obtaining this particular kind of attention (they, quite the reverse, generate other types of attention) (Stiegler, 2007, 174-175, translation by the authors).

This means that for Siegler the school is *more* than a place of initiation alone. And this is because it is *essentially* connected to very specific practices and techniques – especially sitting still, writing, memorizing and exercising (Stiegler, 2008, 94-95). The school forms a *unique* tertiary dispositive that guarantees the ongoing process of individuation.

Endorsing Kant's remark concerning the first task of the education of the youngest, Stiegler argues that the specific material context of the classroom, with rows of desks in front of a blackboard, demands pupils for a long and interrupted period *to remain seated:* this reduces possibilities of locomotion and forces the whole body in such a position that attention is allowed to be maximally focused (Stiegler, 2008, 122-123). *Writing* – which is above all a typical school activity – serves the same objective: it brings forward an embodied form of concentration. Surely, the training of this technique in its incipient form consists in the copying of prototypes (starting with mere orthographic exercise, in order to pass to the written reproduction of fragments of texts, to making one's *own* notes when attending classes, and in the end writing one's own opinions down in an essay). But, when the individuation of pupils *as* subjects capable of writing has – after long and harsh training – succeeded, this also offers opportunities to the new generation for renewing the world. Now, in a sense every educational «program» consists in a kind of writing. Referring to the world in which the school originated, Greek Antiquity, and in which the interrelatedness between writing and education was obvious, Stiegler reminds his readers that «program» literally means the drawing (*graphein*, grafting) of a line, the scribbling down of characters (*gramma*, that what is grafted) (Stiegler, 2006, 180). Education is always a *grammatikè technè*, a «writing skill», consisting so to speak, in grafting again (and again) lines set out by generations that precede us. And, as mentioned before, pro-gramma-tion forms the very condition for transformation or de-programmation (Stiegler, 2008, 177).

More generally all kind of *exercise*, a practice that forms the heart of the material school dispositive, has to do with the careful and meticulous repeating and re-enacting what former generations have bequeathed us as tertiary retentions (*op. cit.*, 123). When studying geometry for instance, pupils are asked to reiterate the various steps that lead from the simplest Euclidian axioms to more and more complex theorems: every generation has to start all over again, beginning with the very basics in order to construct step-by step a whole system of mathematical knowledge. The point is that this demanding and strenuous exercise is not so much a necessary evil we have to go through (and which we hope to make redundant when educational psychologists find easier and quicker methods to instruct pupils),

but an *essential* path to follow in order to become individuated as subjects that capture the richness of a geometrical approach to the world (*op. cit.*, 176 & Stiegler, 2010). So, the practice of math education illustrates, according to Stiegler, very well what it means to be dependent upon a «memory support» that precedes and transcends the individual level, but has to be re-activated in order to continue the process of individuation in the first place.

In sum, it could be argued, according to Stiegler, that these important practices of sitting still, copying, writing, rehearsing, memorizing and exercising have been made a matter of educational concern in the school, ever since the time of its invention in the Greek *polis*. A general characteristic of these «schoolish» activities is that they allow (more than other techniques) the possibility to develop a large concentration span or «deep attention» (a term Stiegler borrows from Katherine Hayles, 2005). And this is, once more, a necessary condition for the process of individuation to take place. Therefore, *to take care for the coming generations is to take care for the school* (Stiegler, 2010).

Now, so Stiegler continues, this institution is in great danger today, because of the particular way in which cultural industries «soak away» attention: introducing on a massive scale psycho-technologies, which might all in one way or another be defined by the use of *screens*, these industries absorb all «available brain time» and generate a large scale de-individuation, envisaging maximal control. This is because the particular prosthesis that the screen is demands a completely different and antithetical concentration span, viz.: «dispersed attention» (i.e. what Hayles [2005] calls «hyper-attention»), being a form a constant alertness and vigilance. Relying here on neurophysiologic insights (Zimmerman & Christakis, 2007), Stiegler argues that the continuous exposure to images on screens has detrimental effects regarding the «architecture» of our brain. At birth cortical neuron are massively and chaotically interconnected (which accounts for the brain's plasticity): neurologically spoken, the process of individuation is based upon a process of «pruning», i.e. cutting away this abundance of connections, so that particular synaptic patterns are generated («synaptogenesis»). Now, when focusing upon screens (watching television), especially at a young age, the shaping of neuronal pathways is prevented, leaving the jungle of multiple neuronal interconnections intact. This might, according to Stiegler, well explain the rise of dysfunctions such as ADD, which are, in his view, clearly no biologically or genetically (internally) determined neurologic pathology, though a «technopathology» that has (external) societal causes (Stiegler *et al.*, 2009, 69-70). This clearly demonstrates that for Stiegler the *sort of technology* is not independent from the *sort of attention* (or immersion) that is allowed for – which could be read as a critique to Burbules' position.

More generally, Stiegler claims that the substitution of «dispersed attention» for «deep attention» threatens the possibility of the new and the singular to come into existence. This is because the process of individuation in an age of digital media and digital learning environments becomes «regressive»: it turns into a process of «disindividuation», in which all «available brain-time» gets «hypersynchronized»,

producing an aggregation or flock of consciousness in which all are adjusted to one another (quite analogous, Stiegler claims, to the life inside ant hills). This is because users of screens become adjusted to the «real time» of industry, demanding a never ending cycle of mindless consumption. If the most catastrophic scenario were to become real, the process of individuation would come entirely to an end and so, for the next generation, all possibility of differentiation, transformation and freedom will disappear irrevocably. However, this is no reason to be opposed to *all* kind of digital technology. This would be a strange attitude for a philosopher who argues that human existence is fundamentally supported by artificial memories and constituted by technical prostheses. On the contrary, Stiegler is the pace-maker of a movement called «Ars Industrialis», which is precisely concerned with alternative applications of the existing digital technologies that might grant «deep attention», as well as the possibility to create «deterritorialized networks»[9]. These are not susceptible to central control, and therefore they might be utilized to further individuation and to defeat the cultural industries, so to speak[10].

4. A MORE CONSISTENT APPROACH: BEYOND THE SYMBOLIC AND THE PRESCRIPTIVE

Throughout the sections that preceded, we hope to have substantiated that Stiegler introduces a quite original approach regarding the central issue we are concerned with in this article, viz. the impact of digitalization on education, viewed from the perspective of corporeity. His philosophical project consists in trying to understand «the human» on the basis of the use of material prostheses and embodied activities that shape subjectivity. And so, defending without any reservation that these artifacts and practices form a memory in a strong and original sense, *education is entirely considered as part of this process*. More concretely, Stiegler shows that (school) education has consisted for a long time (and still consists) in techniques that were concerned with the formation of attention. This perspective is opposed to a more common view, for instance endorsed by Dreyfus and Burbules, that

9. See: http://arsindustrialis.org/manifesto-2010.

10. More precisely, Stiegler regards all technologies as «pharmaka». Referring once more to Plato (and Derrida), the expression «pharmakon» means at the same time a poison as well as a remedy. That what makes a technology potentially beneficent might turn it into a threat (and vice versa). (STIEGLER *et al.*, 2009, 78). This is a most original thesis, as it departs from the mainstream critical views on «cultural industries» (Adorno, Habermas), which analyze the present solely as a «colonization» (a seizure by external forces) of the sphere of life that is entirely meaningful and desirable as it is by a logic that belongs that a sphere that lies completely outside (economical-instrumental rationality). Stiegler, on the contrary, argues that technology is a condition we *never* can do without and that every technique has *inherent* positive *and* negative possibilities *simultaneously*. Books, although they contributed to a general movement of emancipation, can at the same time function as a «poison», in the sense that for some people, books precisely release them from the imperative to think by and for themselves (STIEGLER, 2008, 37-69).

starts from a normative idea of education to assess, *from the outside* so to speak, particular historical and technological evolutions as opportune or not.

However, having a closer look at Stiegler's line of argumentation, a far from innocent inconsistency comes to the fore. The analyses of concrete and contingent (school) practices he pursues are in the end *only* intelligible if a constitutive *a-technological* dimension is brought into play, which furthermore presupposes a clear and a-historical idea about what education *should be*. So, in this last paragraph we will argue that Stiegler in the end contradicts his own point of departure, and will hold a plea for a more consistent «Stieglerian» way of approaching the issue at hand.

Take for example the practice of writing, we discussed in great detail above. On the one hand, Stiegler treats it fully as *an embodied technique*, analyzing it as a register of corporal behavior which is related to very concrete prostheses, and which produces forms of deep attention and shapes particular forms of subjectivity. This evidently presupposes the existence of a tradition of writing techniques, as well as former generations that are willing to take care for the handing down of tertiary retentions. But, on the other hand, Stiegler is also interested in this continuity across generations for reasons that have nothing to do with his initial interest in a technique-based understanding of subjectivation: this is because he suggests that what precedes any concrete individuation comprises more than «technical» retentions alone, but also – and predominantly – something entirely symbolic or cultural. The most important thing seems to be that for many generations before people have not only been *writing*, but above all have been writing *texts* and so have contributed to a *canon* that should be preserved for generations still to come. This is to say that Stiegler is no longer conceiving education as an original prosthetic-graphic activity, but that «grammein» functions in the end *solely as a metaphor*. Departing from his techno-centered framework, the practice of writing appears in the end to be conceived in terms of an idea of education that consists in the task to continue a cultural-historic «line» («gramme»), i.e. a tradition. Educators, representing the older generation, have therefore to make present above all a cultural and intellectual heritage (to which Stiegler also refers as a referential system of identification, see: Stiegler, 2009, to the younger one). As we stressed above, Stiegler is not defending a nostalgic conservatism, but is concerned with the possibility for the generations to come to renew the world. But, with this, the school is also viewed as something far more than a material-prosthetic dispositive, because it gets normatively defined as aimed at the continuation of a representational framework and cultural heritage, which is indispensable when a society wants to protect the young generation against inimical forces that might lead them astray (i.e. cultural industries that envisage massive disindividuation). In sum, tertiary retentions seem to have moved from a corporeal and technological level to that of the symbolic. And, contrary to what he himself claims, Stiegler in the end defines education, quite prescriptively, as being about protection and initiation.

Consider another set of examples to illustrate the same point: in his critical exposition with Plato, Stiegler – consistent with his point of departure – shows that the geometrical insight the ignorant slave boy obtains is the result of physically drawing squares and rhombs in the sand. The subjectivation that takes place here is dependent upon a constitutive exterior memory – of an artificial nature. The other example regarding the study of geometry – viz.: that in order to gain knowledge of advanced geometry, one *always* has to retake all over again a whole system of axioms and derived theorems – *seems at first sight* to substantiate the same point: abstract mathematical knowledge is fundamentally dependent upon tertiary, prosthetic retentions. We however believe that Stiegler puts forward this last case for completely different reasons. This example is close to something philosophy teachers know well, viz. that it is most difficult to start a basic course with explaining the ideas of Derrida of Foucault, but that it is more advisable to reiterate a whole history of thought, from Plato, over Descartes, to Hegel, in order to capture what these contemporary critical thinkers stand for. Analogously, the student of geometry has to go back to the very roots of this discipline and has to reconstruct the system step by step. Even if this analysis might be quite pertinent, Stiegler surreptitiously moves in the direction of a very common discourse on education that defines schooling in view of the initiation of new generations into a symbolic order. The reason why pupils have to return to the basic Euclidian axioms, definitions and theorems seems ultimately to be legitimized by a concern for the safeguarding of an existing cultural heritage (given that school is at war with societal forces that try to turn us into mindless and consumptive herds).

To be clear on this point, we are in this article *not* concerned with discussing the importance of bringing into presence a cultural and symbolic heritage at school, neither is it our ambition to start here a whole discussion about the legitimacy of defining education as an institutionalized form of initiation or as the adversary of cultural industries. We simply want to bring under attention that by introducing this cultural and normative perspective, Stiegler's techno-centered approach is in danger of losing its originality and effectiveness. What we suggest is to take his basic assumptions more seriously and to develop them more consequentially than he himself seems to do. This would imply a way of exploring the issue of education, corporeity and digitalization that focuses entirely on material and technological dimensions, and that restrains from taking a judgmental perspective. This is to say that prescriptive conceptions are no longer guiding this kind of research. More positively formulated, this line of research would consist in the *description* of educational reality – i.e.: of the existing situation as well as of (r) evolutions such as digitalization that are bound to influence it – starting from the idea that processes of subjectivation are dependent upon tertiary retentions, in the original sense of material prostheses and milieus, and embodied practices related to them. This research approach focuses on the way in which artifacts and material dispositives *actually work* – and therefore it contrasts sharply with the habit of considering and assessing technological milieus from a standpoint that lies *outside*

concrete history and practice of education itself. This approach implies furthermore taking seriously Stiegler's hypothesis that the essence of the school-dispositive as we have traditionally known it is the institutionalization of certain techniques and embodied practices of *attention* such as *sitting still, writing and exercising*.

What we suggest is a line of future research that should be elaborated further of course. For the moment we can only give some indications what it would consist in. It might for instance be investigated what it means to get educated without taking notes in a class or college room, but instead looking at registered conferences and studying text material that is made available on screens. Or, to take a far more «basic» example, it might be worked out what it means to learn to count «on line», i.e. without, as it used to happen in primary education, repeating over and over again – usually in group and commanded by a teacher – the tables of multiplication.

First, this kind of research might bring to the fore that e-learners (perhaps) are subjectivated in completely new and unforeseen ways – making possible different forms of attention and being present to a tradition, to a world and to others. The «self that takes notes in class» might be a completely different being than, the «video-conference instructed self». Students who get trained to multiply without the traditional kind of drill might be mastering numbers in completely new and unforeseen ways. Second, this approach might also throw a new light on the educational present itself, which is still to a larger degree organized in traditional «schoolish» ways. For instance, instead of automatically criticizing as a dull and superseded practice the exercising in group and on command to multiply numbers until one knows by heart that «six times eight is forty-eight», the same activity might be disclosed as formative for a specific kind of subjectivization we (still) know today. Complementing the Merleau-Pontian view we discussed in the beginning of this article, it might turn out that the reiteration of this practice might be of a greater importance vis-à-vis mathematical subjectivation than the fact of having ten fingers at one's disposal. This would mean that the current shift towards digital learning might offer opportunities to better understand the meaning of «traditional» practices (without judging these immediately as superseded ones).

To conclude, a consistent elaboration of the Stieglerian perspective, more than he himself ultimately seems to do, might offer a new way to think and speak about the issue of education, corporeity and digitalization. It leaves behind a one-sided condemnation of e-learning as disembodied (as Dreyfus claims), or an analysis of the phenomenon which translates existing criteria (which are established as important independently of concrete educational technologies) into embodied ones (as Burbules argues for). This kind of research is furthermore not envisaged as a critical instrument for judging educational reality on the ground of a normative conception, only to argue *either* that we are risking to give up what education essentially consists in (Dreyfus) *or* that we possibly have found better didactical methods to reach existing objectives in a far more efficient, motivating and child-friendly way (Burbules). It is rather conceived as a descriptive perspective that allows to analyze the meaning of prosthetically mediated and embodied educational practices, such

as writing, exercising and sitting still, in relation to the formation of specific forms of subjectivity, and that furthermore grants the possibility to investigate what might happen in the (near) future, when new technologies are expected to structure processes of subjectivation. This concerns a perspective that fully accepts and explores the interconnections between education and corporeality, and between subjectivity and contingent technological dispositives.

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