Education, digitization and literacy training

A historical and cross-cultural perspective

Joris Vlieghe

University of Edinburgh

Joris.vlieghe@ed.ac.uk

In this article, I deal with the transition from traditional 'school' forms of instruction to educational processes that are fully mediated by digital technologies. Against the background of the idea the very institution 'school' is closely linked to the invention of the alphabetic writing system and to the need of initiating new generations into a literate culture, I focus on the issue of literacy training. I argue that with the digitization of education, a fundamental transition takes place regarding what it means to be literate, but also what it means to educate and to be educated. I do so by developing a 'techno-somatic' approach, which means that I look at the use of concrete instructional technologies, and the bodily disciplines that are involved. I set out a double comparison in which I contrast existing, 'traditional' ways of learning how to read/write with the way in which literacy training looked like before the nineteenth century, on the one hand, and with the initiation into literacy in the Chinese/Japanese language, on the other hand. I argue that these comparisons shed light on the differences between traditional and digital literacy. More precisely, I show that in each case, a different relation toward what it means to produce script is involved. As such, both forms of literacy go together with different spaces of experience and senses of being-able, and therefore with altogether different ideas of what education is all about.

Introduction

In this article I deal with a societal and cultural evolution which might have pervasive implications for the way in which we currently conceive of education, viz. the transition from traditional 'school' forms of instruction to educational processes that are fully mediated by digital technologies. Although this development could be approached from many different angles, e.g. by looking at the substitution of face-to-face classroom teaching with home-based, individual forms of learning, or by going deeper into shifting modes of attention that go together with the use of different instructional media, I focus on the issue of literacy (the ability to read and to write) and literacy training. I argue that with the introduction and the becoming dominant of digital media in the world of education a fundamental shift takes place regarding what it means to be literate. I take this approach, because, historically speaking, the very institution 'school' is closely linked to the invention of the alphabetic writing system, and to the need of initiating new generations into a literate culture: the school was first and foremost created as an institute for instilling the most basic skills of reading (and writing) (Marrou 1982, Masschelein 2011). Of course, basic literacy training is only the precondition for dealing with more advanced learning contents in higher degrees. Nonetheless, it could be argued that this particular kind of training has set an *archetypical model*: its focus on form, rather than on the application of contents in real-life world, its particular disciplinary regime of exercises, repetition and attention-formation, its preference of representing the world by the use of texts and books, instead of raising children immediately by real-life experiences and confrontations, etc. still define the activities we identify today as traditional 'school' activities (Stiegler 2010, Masschelein & Simons 2013).

The approach that informs my analyses here could be called 'technosomatic' (cf. Richardson 2010), and draws a lot from the work of the French philosopher Bernard Stiegler (2010). With Stiegler I argue that the *technologies* used in education aren't merely means that we might work with (or not) and that don't essentially affect our ideas about what education is or should be; rather, the technologies that become prevalent at a certain moment and a certain place decide to a great extent what education is all about (i.e. they decide on what are its basic aims, possibilities and limitations). Moreover, as Stiegler has argued, technologies are not merely the kind of

tools we have progressively been relying on since the invention of non-human sources of energy (steam-power, electricity, etc.). Rather, *hominization*, i.e. the coming into being of creatures called human, is precisely defined by the very use of technologies (Stiegler 1998). Here, the word *technology* not only refers to instruments we use, but also to *embodied* practices (the whole of bodily routines and the gestures related to particular instruments). Hence: a techno-*somatic* perspective. This entails that a stone-axe is as much a technology as a cell-phone is; and cutting an ornament, as well as composing a text-message with one's thumb on a keypad are both equally technological activities. Stiegler's main hypothesis is that the way in which we get hold of these various and very divergent technologies, and the way in which we come to appropriate these by developing a specific set of bodily disciplines, lay the foundations of the kind of human beings we are. In this article I consider in detail various *technologies of reading and writing*, and more specifically I concentrate on the way in which we have come to learn and master these different technologies, i.e. learn and master specific tools and the corresponding bodily gestures. These shifts in reading and writing technologies go together with different conceptions regarding what it means to become a literate person, and so I show how the rise and becoming predominant of digital technologies implies a significant transition regarding what becoming an educated person is fundamentally about.

Therefore, I first go back in time, in order to explore the conception of literacy and the practices of literacy training *before* the appearance of what I have called *traditional* school practices. I show, first, that these 'school' practices are not that traditional after all but that they are actually a more or less recent invention, related to the creation and application of particular writing implements, material supports and schoolbooks. I argue that this historical analysis offers a frame to get a better hold on the shift towards digital literacy[1] – and, with this, on a shift towards an altogether different conception of education. To be clear, it is not my intention to deplore or to denounce the digitization of education. My objective is to map different spaces of experience and new possibilities

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[1] With the concept of *digital literacy*, which I use throughout this article, I do not refer to new social practices related to the use of digital devices, which is for instance the case in New Literacy Studies (e.g. Kress 2004, Gee 2007). Although the views I defend here might have implications for these alternative views on literacy, the scope of this article is limited to literacy in a very basic sense (the ability to read and write). Digital literacy refers then merely to the practice of writing and reading with the use of keyboards, screens and touchscreens, rather than with paper and conventional implements.

for education in a digital age. More precisely, I want to analyse this new sense of what it means to be literate, and to be educated, by making a further cross-cultural comparison with literacy initiation practices in China and Japan. I show how an exploration of these practices might reveal a profound insight about what it means to be able to create text, exclusively using digital means.

A brief history of western literacy practices: a story of connections and disconnections

Although the Western world has known an alphabetic form of literacy since Greek Antiquity, the way in which most of us have learned the alphabet is the result of evolutions in the pedagogy of reading and writing that date back to a not so long bygone history[2]. This is to say that the idea that literacy initiation comprises learning *both* to read *and* to write, as well as the idea that it aims at acquiring a *general* disposition (the ability to read, in principle, *every* possible text) - two things usually taken for granted due the initiation into literacy most readers of this article most probably have - , are actually of a rather recent date, and are bound up with distinct technological inventions.

A brief look at the literacy training practices as they took place in the cathedral schools in Late-Medieval times illustrates this point. Here, the sole aim was to learn and read a very limited sort of texts, such as prayers, songs and Bible passages (Chervel 2006, Chartier 2008). The starting point of this training was always a text one already knew by heart, e.g. the *Pater Noster*, and the instruction consisted essentially in asking the students to break down the various words and spell the various syllables: 'pa-ter nos-ter', 'sanc-ti-fi-ce-tur', etc. In this way one learned to master, step-by-step, the knowledge of syllables, and this allowed in turn for reading similar (religious) texts. However, seen from a contemporary perspective, it would be more adequate to say that this kind of 'reading' is closer to 'saying' than to 'understanding'. Reading and praying were almost synonymous words (Ibid., p. 12). As such, this kind of literacy instruction did not allow for developing a general reading disposition. Moreover, it was solely

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[2] A complete historical account of literacy training should also discuss the relationship between learning how to speak a language and learning how to read/write. Although I will come back to the relation between written and oral language later on when I discuss the differences between alphabetic and non-alphabetic scripts, the focus of this paper is solely on literacy training.

focused on learning how to read (learning how to write was an even more seldom privilege reserved to copyists of manuscripts).

This Pre-modern form of literacy training has thrived long after the end of the Middle Ages and has become known as the 'universal method', i.e. a technique that could be applied by anyone: children only needed the help of a grown-up to direct their attention to a printed text of a prayer they already knew in order to learn to read (Rancière 1991). This could easily take place outside of school. Things only changed slowly, and a milestone in the evolution towards the system we know today was the creation of so called *syllabaries*, i.e. specially designed handbooks that consisted of rows and columns containing all possible syllables used in a specific language (e.g. a column composed of ab-ac-ad-af and a row consisting in ab-eb-ib-ob)[3]. This meant an enormous step forward, because this particular technological invention allowed students to become able to read *any* text (rather than to recite religious texts). Moreover, this also implied that the activity of *learning how to read* became something entirely different and separate from the activity of *reading* itself: whereas the old form of literacy-training implied exactly the same kind of 'reading' one was supposed to get to master as an adult person, learning to read syllables consisted in training meaningless strings of letters. Only later on, this skill would be applied while reading real (meaningful) texts. It concerned thus a very specific, and purely *formal* practice that is only to be encountered *in schools* and not in daily (adult) life (Cf. Mollenhauer, 2013, p. 31)[4].

Nonetheless, just like in Late Medieval Days, learning to read and learning to write remained two separate pursuits. The practice of *simultaneously* learning to read *and* write only arose in the 19th Century (Chartier, 2008, p. 22). This resulted from particular societal[5] and above all technological evolutions, viz. the invention and spread of resistant metallic quills and cheap cellulose paper, as well as the large-scale distribution of graphic alphabet books[6]. For the first time in history it became possible

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[3]   A   famous   example   is   the   so   called   *New   England   Primer*   (1690).   See: http://public.gettysburg.edu/~tshannon/his341../nep07pg4_5.htm (accessed 28/11/2014)

[4] There are no meaningful occasions to do readings like ab-ac-ad-af, eb-ec-ed-ef, etc. in everyday life.

[5] In languages like English or French, where the relation between spelling and pronunciation of words is very complex and ambiguous, this also meant that it was necessary to decree officially one and only one uniform system of spelling, which only happened as early as the 19th Century (cf. Chervel 2006).

[6] See for example the famous 'Méthode Cuissart', which was also essential to the movement of mass schooling in   France,   instigated   by   Jules   Féry,   and   in   vogue   until   the   1950's.   See: http://manuelsanciens.blogspot.be/2012/04/methode-cuissart.html (accessed 28/11/2014)

to 'squander' tons of paper solely with the purpose of *writing* meaningless strings of letters like aaaaaaaa, bbbbbbbb, cccccccc, over and over again. Also, manuals were developed that contained letters printed in a *cursive* mode, which is to say that they resembled the rounded and flowing character of longhand writing. And so, due to these developments the signs one mastered to read became simultaneously the object of rigorous calligraphic practice. Literacy training also became an initiation into writing. With smaller changes, this is still the method which is common practice in large parts of the Western world.

This short historical overview shows that the common, traditional conception of what literacy initiation is supposed to look like is actually a very recent phenomenon, and moreover that it is related to sometimes unforeseen evolutions in the field of (instructional) technologies, such as the development of writing implements and the creation of a characteristic sort of handbooks[7]. It is these technological inventions, together with the kind of practices they involve (mere reciting; reading as a generally applicable skill but without a close connection to the capacity to write; reading and writing simultaneously as the result of doing repetitive exercises), that decide on what it means to *educate* someone to become *literate*. This is also to say that there is a specific way of teaching and learning, which we call *schooling*, but which is itself a historically situated and contingent, non-perennial reality, that is dependent upon the use of a precise sort of technologies (Cf. Masschelein 2011). Furthermore, all this implies that the 'the school' might become utterly redundant one day and even disappear in the (near) future.

More positively spoken, this small genealogical account also helps to come and understand what is typical about a 'traditional', i.e. a 'school' way of learning to read and write. It could be argued that this particular kind of literacy initiation fundamentally comprises a twofold, simultaneous process of connecting and disconnecting. On the one hand this form of literacy training is based on generating a strong and systematic

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[7] My approach is close to the genealogical explorations we find in Klaus Mollenhauer's book *Forgotten Connections* (2013), but also in the work of Norm Friesen (who recently translated this book), e.g, in his article on the history of the textbook (2013). Both show how formal education as we know it today is conditioned by very specific historical evolutions and look at the development of pedagogical tools, and textbooks in particular. My approach differs from theirs because I stress more the material and technological side of these tools, whereas Mollenhauer and Friesen are first and foremost concerned with the content these tools give access to.

connection between a subject matter (reading texts) and the way in which this subject matter comes into being (writing texts): if one is only able to read without having mastered the skill to produce text oneself, one cannot (or can no longer) be called a literate person. What is at stake in becoming literate seems to be that students simultaneously come and experience, at a very direct and bodily level, what it means to generate the very things they learn to read. They literally have 'firsthand' knowledge of what creating script is about. Becoming literate is not just a matter of consuming letters and words (like being able to drive a car without having any knowledge of its mechanics), but at the same time requires that one has a strong and inside experience of creating letters and words oneself (similar to the experience the car mechanic has while driving) (Cf. Stiegler & Rogoff 2010)[8]. Now, this sharp awareness of what it means to produce script is dependent upon the particular characteristics of the literacy training as it traditionally takes place in schools. In order to be in touch with one's productive powers, a particular focusing of one's attention on letters *as letters* is required. And, this requires a form of instruction in which a *disconnection* takes place between the formal characteristics of reading and writing technologies on the one hand, and the contents and the uses that these technologies facilitate. It seems vital to the school-like acquirement of literacy skills that students repeat over and over again strings of meaningless symbols (learning by heart the abc; jotting down strings of aaaaaaa, bbbbbbb, cccccc in order to be able to produce characters more or less resemble the standard form a, b and c have) *before* they start applying this embodied skill to deal with meaningful texts. In order to master script, literacy training is, at least temporary, an aim in itself: it consists of purely *formal* exercises that are disinvested with any precise content or use, and that are disconnected from the 'real' world so to speak. Again, learning to read and write is qualitatively different from reading and writing themselves.

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[8] The ideas I defend here are based on Stiegler's analysis of what the training of longhand writing involves. As such, my comments here fail to take into account the depth and complexity of the whole of Stiegler's work on education. Whereas I am interested in the impact of literacy practice at an experiential level, Stiegler is mainly concerned with the larger social and cultural implications of educational technologies. More precisely, these technologies might either work against or assist so called 'long-circuits' which support intergenerational ties. A more detailed account of Stiegler's views on this, as well as how the issue of intergenerational transaction is related to the (mis)uses of particular literacy technologies, can be found in a forthcoming article on this issue (Vlieghe 2015).

Disconnecting writing from reading and reconnecting literacy practice to meaningful content

In what follows I contrast this account of traditional literacy training to what can be expected to happen when digital devices (keyboards and screens, but also interactive touchscreens that combine both at once) become the sole or prevailing technology for reading and writing. On a closer look, such a shift involves a radical *inversion* of the double process of connecting and disconnecting I just analysed. On the one hand, the tight connection between consuming text and producing text seems to disappear: learning to read and learning to write are *disconnected* again. Of course, I am not claiming here that digital natives no longer learn how to compose texts on their keyboards and touchscreens – and I am certainly not suggesting that digitization implies a return to Premodern ages in which most 'literate' people were factually unable to write[9]. However, it can be argued that the concrete ways in which one learns to produce text on a keyboard are qualitatively different from learning to do the same with pencil and paper.

In the last case it is vital that one trains the body in such a way to form letters that accurately resemble a stereotypical model. Longhand writing is fundamentally a 'graphomotoric' enterprise (Mangen & Velay 2010), meaning that writing an 'a' and 'b' consist of *producing* different things. Over and against this, touching an 'a' or a 'b' on a screen, or hitting the appropriate keys on a keyboard consists of a 'pointing' gesture (Ibid., p. 396), and as such generating an 'a' or a 'b' is essentially the same act: while typing, 'the letters are "readymades" and the task of the writer is to spatially locate the specific letters on the keyboard.' (Ibid., p. 386)[10] Although keyboarding still demands a

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[9] As Baron (2009, p. 229) suggests, although the impact of digitization on the amount of reading we do is still the object of discussion, it is clear that with the introduction and proliferation of digital media more people write more, that people have increasingly come to write in new genres and that they more and more feel to have control over the things they write.

[10] A similar argument has been made before by Heidegger in his *Parmenides*-lectures. Here he criticizes the invention of the typewriter, because it brings along a mechanization of our writing abilities and therefore an alienation from a more original and direct way of expressing one's thoughts and feelings: 'Mechanical writing deprives the hand of its rank in the realm of the written word and degrades the word to a means of communication. In addition […] [t]he typewriter makes everyone look the same' (Heidegger 1992, p. 81). Typewriting, according to Heidegger, is an *improper* use of our literacy capacities, which stands in the way of true self-actualization and which gives cause to a cultural homogenization. Nevertheless, the ideas which I develop here are not so much geared at drawing the kind of fatalistic conclusions as Heidegger does. Instead, I want to map at a phenomenological level the differences in experience that go along with the use of various writing implements.

sometimes painstaking period of training in order to acquire the necessary bodily routines for typing blindly with ten fingers, the relation between the generative gesture and seeing the letters emerging before one's eyes is completely cut through. No longer is there an intimate knowledge of what it means to produce letters when one points to a key and thereupon sees appearing the corresponding sign on the screen. It is in that precise sense that I claim that a disconnection between consumption and production takes place[11].

At the same time, digital literacy training implies that there takes place a *reconnection* at another level. Consider again that it makes sense, during traditional literacy practice to write over and over again the same letter – and that this involves a disconnection between purely formal operations on the one hand, and the uses and contents to which these operations give access on the other. It's obvious that this practice has no sense whatsoever when learning to type on a keyboard or touchscreen[12]. Rather than repeating the same letter, it is vital that one immediately learns to type words and texts: the endeavour at stake is not to learn and type an 'a', but to acquire an embodied knowledge of which keys to hit in order to make the words one intend to write to appear on the screen. So, for a beginning student, it might be a worthwhile pursuit to type again and again one's own name on the keyboard. This implies, however, that the things one produces already possess meaning. Here, learning to write is no longer an activity stripped of all meaning: *learning to write is at the same time writing*. The same argument could be made in relation to reading. Learning to read and write with keyboard and screen immediately involves reading *something*: they are no longer end in itself. Mastering literacy in a digital way is from the very beginning oriented towards meaningful words and texts and no longer deals with the production of meaningless letters.

These differences between traditional and digital literacy training are not superficial, and I would claim that the comparison I have just pursued offers valuable clues to come and understand what is at stake in traditional literacy. Because there is a strong connection taking place between the consumption and the production of text, one has a

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[11] Cf. Stiegler's (2010) analysis in this regard, who calls this shift a contemporary form of *proletarianization* (the severing of consumption and productive capacities).

[12] This might however have been a relevant practice in the days of mechanic typewriters, when one had to develop the muscular strength to push some keys with one's little finger.

heightened awareness and highly embodied sense of what it means to write, i.e. what it means to *generate* very material letters that are the potential bearers of meaning. However, this sense of being-able is related to a practice in which this generative activity is disconnected from any practical application and pursued as a goal in itself. As such it allows for an immediate experience of what it means to be able to bring script into being. A school-like literacy training thus generates *a profound sense of ability* which is firmly embodied in first-hand routines and disciplines[13]. What is at stake here is thus not a superficial awareness of one's abilities to do this or to do that (e.g. to be able to write one's own name), but – as Giorgio Agamben (1999) suggests when coining the term 'potentiality' – a strong experience of ability *itself* (a direct experience of oneself as a creature of possibility rather than of necessity). The stress is than not on the fact that one can do *this* and can do *that*, but entirely on the fact that one *can* do this and that[14].

This profound sense of ability wanes, at the moment that reading and writing fully become digitally mediated technologies. However, I want to specify my line of argument right away, by clarifying the two following points. First, I'm not implying that reading and writing with a keyboard (or with a touchscreen) is less of an embodied enterprise than traditional practices are: both require bodily interactions with instruments and both demand the acquisition of bodily routines and gestures. My point is that differences at this techno-somatic level go together with differences in spaces of experience, meaning that at a phenomenological level reading and writing might come to mean something altogether different due to the digitization of education. Second, I'm also not suggesting that digital literacy doesn't go together with a sense of ability[15]. On the contrary, reading and writing on screen might entail *a new and formerly*

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[13] I would claim that the work of the American artist Cy Twombly, who devoted his life to large-scale canvasses that contain calligraphic experiments, puts on display *what it means be able to write* by persistently repeating strings of letters (Cf. Agamben 2003).

[14] In that sense my view is counter to Andrew Davis' recent criticism (2013) of the synthetic phonics method. One of the basic ideas he defends is that this method prevents pupils to *really* understand the meaning of the words they compose on the basis of their knowledge of individual letters. People who learn to read only manage to do this in spite of synthetic phonics practice, which in itself is a pure waste of time, according to Davis. A detailed discussion of his arguments can be found in Vlieghe 2015.

[15] In that sense my view is close to the basic inspiration of Stiegler's work. According to him (Stiegler 1998) all technologies have a *pharmakon*-character, meaning that they are both poison and cure. Defying a techno-deterministic view (which comes down to saying that (digital) technologies necessarily bring about devastating effects, or for that matter that they automatically lead to a prosperous future), Stiegler shows that every technology allows for beneficial uses *and* contains the possibility of uses that are detrimental.

inconceivable sense of ability. The challenge is then to map and to analyse these different spaces of experience and these different forms and conceptions of ability.

I'm well aware that, so far, I haven't dealt with digital literacy in positive terms. By highlighting divergences, first between what happened in Late-Medieval Cathedral schools and in 19th Century schools, and second, between the by now accustomed ways of training literacy and an entirely digital way of literacy-initiation, I have only tried to flesh out what is typical and valuable about 'school' forms of learning to read and write. However, in the remaining parts of this article, I shift my focus and try to deal with digitally reading and writing as a proper and distinct form of literacy. Therefore I have to make yet another digression, and turn my attention at the initiation into non-alphabetic forms of writing, and more specifically into systems that are composed of signs that are (at least originally) pictographic. Therefore, I analyse, in the next part of this article, writing techniques that are based on hanzi or kanji characters, typical for the Chinese and Japanese language respectively. I do this because in these languages a similar disconnection is to be found between text production and consumption on the one hand, as well as a strong connection between learning to write and producing signs that immediately and intrinsically convey meaning.

A cross-cultural perspective on learning how to write

The disconnection here refers to the particular relation between spoken and written language which departs radically from the alphabetic system. The alphabetic system can be seen as a writing-technology that obeys an *acoustic* logic (Flusser 2011): every letter is a materialization of a discrete sound. Letters (graphemes) represent sound-units (phonemes). Just like *any* melody can be analyzed into combinations of twelve discrete musical notes (do, re, mi, ... and the five semi-tones), *any* meaningful expression in spoken language can be built up from a fixed set of about twenty to thirty graphemes (a,b,c,d, ...)[16]. This means that one can easily read words the meaning of which one doesn't know (or that one is able to read inexistent words for that matter). Writing systems that use characters based on pictographs (ideograms and logograms), and thus

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[16] Of course in languages such as French and English, in which the relation between script and speech is relatively complex, one and the same letter (or combinations of letters) might represent more than one sound (phoneme).

on a *visual* logic, don't know such a close reciprocity between script and speech[17]. Such a script can't be immediately read: in order to do so, an interpretation is required, so that the meaning of the written can be expressed into oral language in the first place (Ibid.).

This difference between an acoustic and a visual account of script is reflected in the respective forms of literacy initiation. In order to become a competent writer in the alphabetic system, one or two years in primary education normally suffice. After all, one merely need to master 26 or so signs. Learning to write the characters that build op the Chinese and the traditional Japanese language[18], on the other hand demands that one is able to recognize and to reproduce a very large number of characters. For instance, during the six years of primary education in Japan pupils have to learn and master 926 characters, whilst the remaining 939 symbols still have to be learned during secondary and higher education. (Griolet 2001, p. 141). More importantly, the reciprocity between learning to read and learning to write, so characteristic for alphabetic literacy practices, at least in the last hundred and fifty years, is absent. Learning to read and learning to write Chinese/Japanese are two altogether different things.

Moreover, in the educational system the visual character of the hanzi/kanji is being used as a didactical principle. In order to learn to write the most essential characters pupils in the first year of elementary education in Japan start with *copying* images of the things kanji refer to. To this aim, simple pictures are used, for instance a depiction of a landscape containing some human being lighting a small fire and a cloud from which raindrops are falling. Pupils are then asked to literally copy human being, fire and rain, be it in an increasingly nonconcrete, simplified and standardized manner, so that a certain moment their drawings of these things become abstract signs for the things in question. On the basis of *depicting* concrete stuff, they gradually become able to *write* 人, 火 and 雨 (the kanji representing (wo)man, fire and rain). This didactics clearly departs

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[17] This is not to say that in the Chinese language, for instance, characters don't play roles similar to phonograms in the alphabet. However, as Tze-wan Kwan argues, although "the sound aspect of the Chinese script does contribute to meaning [...] we find in the Chinese script a whole wealth of semantic information expressed through visual-graphic rather than audio-phonetic means. We witness often the situation where, starting with a few simple and sensible components, and with the help of some imagination, extremely subtle and even idealistic [i.e. abstract] meaning structures can be constituted." (Kwan 2011, p. 412)

[18] The Japanese language also has a 'Katakana' and a 'Hiragana' syllabary, where a limited set of ideograms is actually used as a phonetic notation system. This is for instance indispensable for writing down loan words. Chinese also has phonetic notation system for the spoken language, viz. 'Pinyin'.

from the kind of calligraphic exercises that lay the groundwork for alphabetic literacy: not only is a greater amount of time required, exercising script fundamentally amounts to *sketching*.

With the more complex symbols which are to be learned during higher stages of school, this iconic relation with reality is less clear[19], but nevertheless images are still employed to give an indication of the sophisticated architecture behind the kanji. Pictures are then used to draw attention to the fact that two constituent lines of one sign don't exactly have the same length or are not entirely parallel, but also to point out the fact that parallel lines should be well balanced or show a particular symmetry. And, like in the case of building a house on the basis of a blueprint, students have to master the capacity to construct kanji line by line and step by step (i.e. in a fixed order) (Renonciat & Simon-Oikawa 2009).

Therefore, learning to write kanji consists of acquiring a set of bodily routines that are totally different from what learning how to write letters and words in an alphabetic system implies. Whereas the sense of writing down alphabetic characters draws from the fact that script captures sound, the sense of writing kanji draws first and foremost from a reference to the visual world. Moreover, what is at stake is not to mechanically reproduce a very limited set of meaningless signs (abcd…), so much as to manage *a highly sophisticated system of drawing* – not only in the sense of creating signs that (initially) maintain a profound connection to the reality they refer to, but also in the sense of constructing complex graphic compositions. In sum, literacy initiation in Chinese and (traditional) Japanese first testifies to a *disconnection* between reading and writing. Learning how to write is an activity distinct from reading (which in these languages amounts to conversing script into the spoken language, without there being direct acoustic clues present in the written text). Moreover, this distinctive activity is based on mastering Daedalean graphic competences, which consist of *connecting* to a meaningful visible reality.

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[19] This is because the more complex signs aren't mere ideograms. For instance, out of 人 (human) and 木 (tree) one may compose a new character, viz. 休 ('man leaning against tree', i.e.to rest). Also, signs need to be invented to deal with problems caused by homonyms, and for many other linguistic functions (See Renonciat & Simon-Oikawa 2009)

Literacies as various ways of experiencing the ability to produce script

Now, in my view, a closer look at these writing systems, and more specifically at the concrete practices of learning how to master them, might shed light on the transition from traditional to digital literacy. However, the point I want to make is not that in a digital age the use of images might become more important than the use of text, or that images even might come to replace text entirely (cf. Kress 2004, Flusser 2011). The above analysis of a pictograph-based writing system, was meant to show that we might take different relationships towards script, and that it makes sense to speak about 'textual figures' (Gervais 2013). This analysis shows that it is possible to deal with text-production in ways similar to how artists relate to drawing, or architects to construction plans. In view of the correspondences between the initiation into a pictograph-based writing system and acquiring literacy by digital means (as a particular process of disconnecting and reconnecting), it becomes possible to flesh out in greater detail what this new mode of relating to text might consist of. More precisely the opposition between traditional and digital literacy can be analyzed in terms of different senses of being-able, in the Agambenian sense of potentiality fleshed out earlier in this text.

As I have tried to make clear, an initiation into literacy by repeatedly practicing senseless letters and by acquiring graphomotoric control might offer a sense of ability that comprises a sharp, firsthand and embodied awareness of creating meaningful things out of letters. This is to say that, by slowly grinding in our hands and fingers the competence of forming alphabetic characters, one understands *from the inside out* what generating meaningful script (i.e. text) is all about. Over and against this, an introduction into literacy with the use of keyboards and (touch)screens only, letters no longer appear *as such* (i.e. they no longer appear in their full materiality). This is because the capacity to read characters is severed from the way in which they are materially produced, and because the production of these signs is immediately connected to the production of meaningful text. Learning to read/write, as I said, is *itself* reading/writing. As such, the *first-hand* sense of potentiality which was at stake in traditional or school-like forms of literacy initiation disappears.

This might sound as if I'm claiming here, first, that this transition should be criticized or regretted, and second, that the use of digital devices and the initiation into literacy with these devices renders bodily interaction redundant or absent. However, the opposite is the case. I must repeat that my approach is more descriptive than it is normative: my aim is to explore and to understand what happens when mastering literacy becomes a digital affair. This is not to say that something of great value is lost forever, so much as to argue that with digital literacy a new and different way to relate to script is being granted, and more precisely *a new sense of ability*. Moreover, throughout this article I have made an argument for a technosomatic view on reading and writing. This is to say that *both traditional and digital literacies* require the use of very material tools and the training of bodily routines. My whole point is then to say that these differences in the concrete, material and corporeal ways in which we acquire reading and writing skills, go together with different conceptions of *what it means to be a literate person*. It is precisely for this reason that I finally turned to an analysis of literacy initiation into a pictograph-based writing system[20]. This analysis might contribute to a deeper understanding of the proper form of ability that goes together with an initiation into digital literacy.

Becoming literate by exclusively using digital means, we take a *completely different* relationship towards the script which we produce[21]. Analogous to what is at stake in getting hold of hanzi/kanji, we experience first and foremost that we are able to build something, and moreover that the words that appear on our screens are in and of themselves meaningful. Therefore, the experience here is no longer one of inside out, as it is the case in school-like literacy training, where we get a very strong sense of generating meaning out of nothing. Instead, we are instantly being confronted with meaningful bits and pieces that are experienced as building blocks we can do something

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[20] I want to stress and repeat here that I am fully aware that Japanese and Chinese languages aren't merely pictographic writing systems.

[21] This is also to say that digital literacy should be termed a literacy *in its own right* – and not just a metaphorical form of literacy to be understood and assessed by referring to so-called 'true' literacy (i.e. what I have been calling traditional literacy). A conclusion to draw from this is that a school curriculum which takes this transition from the pre-digital to the digital seriously, should include a basic subject matter which might be called a *spelling and grammar of the digital*. This consists of a training of digital writing and reading skills that begins at the most elementary level. Comparable to what happens during spelling and grammar exercises in traditional literacy instruction, this subject focuses on the formal dimensions that lie behind the things we produce, and aims at a deeply embodied and firsthand sense for the possibilities (and threats) inherent to digital writing/reading technology. For a more detailed account I refer to my forthcoming article (Vlieghe 2015).

with. Therefore, our experience with learning how to write digitally should be termed *outside in*. We approach script from the outside, i.e. as something that is already full of meaning. Whereas traditional literacy consists of the ability to *create* script on the basis of a strong awareness of *letters* that aren't yet meaningful text, digital literacy refers to the ability to *construct* written language - and more precisely to produce *text* out of text. Literacy is no longer a capacity of letter-making, but of text-making. And, literacy training is no longer a matter of getting calligraphic control over *letters*, but of manipulating *text* on screens. Blending here a most unusual metaphor, learning to write with keyboard and screen amounts to a form of 'sketching text' (in the sense that practicing kanji could be said to consist of sketching exercises).

In sum, there is a fundamental difference between traditional and digital literacy, or more precisely between *what it means to be a literate person* in digital and pre-digital times. Moreover, this difference relates to the opposed ways in which one learns to manage particular technologies of reading and writing – materially, technologically and bodily considered. With the rise of new technologies a new sense of ability sees the day of light, and with this, perhaps, a whole new conception of *what it means to be an educated person* altogether. After all, as I indicated at the beginning of this article, literacy-initiation has been for a long time the very model for how education looks like - i.e. school-like. This is more than just making the (perhaps obvious) observation that as a result of digitization schools might disappear in favor of on-line learning platforms or that, at least, the outlook of existing schools might completely transmogrify. Instead, I point at a possibly far more profound transition, viz. at the level of how education *as such* should be conceived.

This is to say that under pre-digital conditions education related not merely to processes of socialization, qualification and transferring to the next generation a body of knowledge and know-how, but moreover to the possibility for every member of this new generation to experience herself as being a newcomer in the strong sense of that word (Cf. Arendt 1968): the educated person is the *one who literally can begin anew* (with the body of knowledge and know-how offered to her by the older generation). As such, the educational refers first and foremost to a strong experience of not-being prisoner of an existing order of things. And, this based on a sense of ability, prototypically encountered in the traditional literacy training as I have analyzed it.

What is finally at stake in this school practice is an awareness of one's productive capacities, which comes down to bringing into existence something that is new and unforeseen. When digital media become the prevailing and perhaps exclusive medium of instruction and learning, a fundamental shift might take place regarding this sense of potentiality. What is at stake here is *an altogether different awareness of what newness and creation are all about*. As I have suggested, this regards an awareness of one's productive powers in terms of constructing with that what *already* exists, or with that what *already* has a meaning. Instead of generating new meaning from within, the digitally educated person is the one who comes into a world of meaning 'outside in', and who regards the creation of the new in a much more immanent way.

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