I Learn, You Learn ... Which is the Impact of Digital Technologies on Learning?

Associate Professor Anca Popovici PhD
Faculty of Psychology and Educational Sciences, University of Bucharest
anca.popovici@fpse.unibuc.ro

Abstract

The article focuses on three key messages: (1) learning is a natural process; (2) authentic learning is a process that generates positive emotions, satisfaction, and self-esteem; (3) the use of digital technologies influences the dynamics of the learning process.

Why should we talk about learning?

"There live the dragons!" used to write the old cartographers while marking the terrifying lands, unknown to that moment. As the advancing knowledge grew, the dragon-dwelled territories diminished in turn. However, there are still enough dragon-lived areas on our mental maps, including those that aim to represent what learning means. Often in my classes with teachers or students who are preparing to become teachers, I ask them - *what does learning mean?* It becomes immediately apparent that beyond the spaces that still require in-depth, scientific research, our mental maps are fairly "patched" and sometimes even erroneous, which can become dangerous insofar as they lead directly or indirectly to unjustified anxieties ("I cannot learn!"), groundless attitudes ("I do not like to learn!") and bad practices ("I do not know how to learn!"). All teachers urge us to go home and learn until next time we have classes, but so few of them tell us what this learning implies and how it is recommended to do it. Most of us have tacit, implicit knowledge, based on personal experiences about what it means to learn and most often relate the learning issue to school as if learning doesn't happen outside its gates.

However, we live in a society that we label as a *knowledge-based society* that is increasingly committed to recommending all its members to engage in learning processes *anywhere, anytime, anyway*. We witness this as we can easily notice that the period of time assigned to compulsory

education is increasing in most countries, non-formal education (in places other than school) is in constant ascension (also reflected in economic terms), adult education is developing as a distinct professional field. It seems this is the best moment to talk about learning not necessarily before a forum of specialists, but especially in the *agora*, in front of the general public, although any action in this regard remains a challenge and I might be accused of reductionism and a certain superficiality in approach.

The purpose of this article is quite simple: to examine your attitude towards learning, to approach it as a natural process (similar to that of breathing) that allows us to become, to grow, to feel fulfilled and which today is influenced by the use of digital technologies.

Therefore, in the beginning, I suggest you a short mental exercise. In a few seconds, fill in the following three sentences with attributes that you consider relevant for yourself:

- I am ...,
- I am ...,
- I am ....

Although this exercise might be similar to a personality test, it is not my intention. It is important to identify three attributes that are representative for you without reflecting too much on them. Well, in most of the cases, these personal attributes that we tend to fill in are the results of a learning, developmental process, involving cognitive (knowledge), affective, motivational, volitional components, a single element of or the whole personality. Whether it is the focus on *roles* – e.g. mother, doctor, IT-student, student, etc., or on *values* – e.g. modest, tolerant, friendly, etc., or on *personal qualities* – e.g. intelligent, communicative, sociable, etc. or even *vulnerabilities* – e.g. disorganised, impulsive, impatient, etc., each of them represents a complex socio-cultural construct that involves mechanisms of learning the meaning, specific behaviours assumed and carried out, comparative analysis and evaluation mechanisms, etc.

Consequently, what is learning? As stated above, learning is a natural process, *it is a mechanism we are born with and which allows us to adapt to the environment*. J. Bruner said that our specialisation as species is learning. It is a response to an equally natural development need at all levels of personality. This is why authentic learning is accompanied by pleasure and generates positive emotions, satisfaction, and self-esteem. What exactly am I referring to? Remember how you learned to ride a bicycle, a sledge or climb a tree. Or, simply look at any child who learns to

talk or walk. The interactions that each of us had with a small child are just as many evidence that joy, perseverance, effort accompanies learning. I would like to draw attention to the fact that the existence of pleasure, the joy of learning does not imply the exclusion of negative emotions, frustration, or sometimes even physical pain. These are obstacles that a person undergoing a learning process is determined to overcome. He/she feels an intrinsic developmental need, the explicit or implicit goal being much more important than the obstacles met along the way. Do you know a single case in the history of humanity when a child said: *hmm, walking is not for me, I have already had enough scratches?* Probably not.

Thus, it becomes a paradox (or perhaps not) the obvious decline of students' engagement and motivation in the school learning process. How can we explain this shift from an enjoyable, almost "instinctive" activity to an activity that is often accompanied by stress, anxiety, and refusal? On one hand, it can be easily noticed that the school requires an overwhelming effort especially of cognitive type, and on the other hand, the learning activities are often characterised by poor authenticity, lack of connection with everyday life and lacking recognition and attention to emotional and social components. Mostly, today students perceive school as being very far from their own reality and, therefore, less relevant.

From that natural mood and trust-based desire, we come to a lack of self-confidence, anxiety and avoidance. Mistakes, punishments and assessments as an integral part of learning at school lead to the emergence of negative emotions that induce a short circuit of the cortical system and thus annihilate the superior processes of thinking. In the presence of anxiety, learning is suspended!

Learning requires an organic, integrated response of a person; it occurs when sets of cognitive, affective, motivational, volitional, and attitudinal mechanisms are put into action. Known and committed to, in close relation with each other, they can become prerequisites for the development of authentic learning contexts.

Intellectual technologies, digital technologies

The discussion on learning becomes all the more necessary in relation to the studies on new generations and the features they develop as a consequence of using digital technologies. Concern about how intellectual technologies influence the learning process and human development as a whole is not a recent one. Nicholas Carr said in his quite fascinating book *The*

Superficial. The Effects of the Internet on the Human Brain (Carr, 2012) that any technology is an expression of human will. Through our tools, we seek to expand our power and control over the circumstances in which we find ourselves.

Two technologies are relevant and revealing in the present case, given our familiarity with them: modelling thinking by representing and conceptualising space with the help of the *map* and respectively, time with the help of the *clock*. The historical progress of cartography has not only mirrored the development of the human mind but it has contributed to the propulsion and orientation of the intellectual progress it has documented. The map is a medium that not only stores and transmits information but also incorporates a certain way of viewing and thinking, clearly contributing to the evolution of abstract thinking. What the map did for space - to translate a natural phenomenon into an artificial and intellectual representation of that phenomenon - another technology, the mechanical clock, did it for time. The mechanical clock has changed the way we see ourselves. Since the clock has redefined time as a series of equal units, our mind has begun to emphasise the methodical mental activity of division and measurement. The methodical ticking of the clock contributed to the emergence of the *scientific spirit* and *scientific man*.

The impact of digital technologies seems to happen even faster, while psychology, cognitive sciences, neurosciences and educational sciences are all bringing their contribution to explaining the phenomenon of learning as it is today, modelled also by using these digital technologies. Clearly, the problem that arises is not related to *whether* digital technologies influence learning, but to *how* this phenomenon occurs. Furthermore, this is not just about the fact that technologies develop and strengthen new categories of skills but, moreover, they substantially "reconfigure" and put in a new light the skills we already own or socially value by adding them new dimensions and meanings. An eloquent example is presented by John Seely Brown, who in his revealing article *Growing Up Digital. How the Web Changes Work, Education, and the Ways People Learn* (Brown, 2000) referred to the literacy process. Thus, in the author's view, literacy today applies not only to the text itself but we can speak of image and screen literacy. The ability to "read" multimedia texts and to feel comfortable and competent in front of new and different categories of digital technologies is not at all trivial. We often overlook this ability; we tend to think that watching a movie, for example, does not require any specific skill. If, however, you

had lived out of society for 10 years and then returned and saw a movie, you would have considered this experience to be a confusing, jarring one. The format of the news, and even the first page of newspapers - are very different from those 10 years ago. However, web genres change over much shorter periods of time, up to several months. New literacy, beyond text and image, is one that involves the ability to navigate through the multitude of information.

Digital technologies and learning

Don't you sometimes have the impression that someone has "worked" a little on your brain? That memory, attention and even thinking are not what they used to be? No, it's not that your mind is deteriorating, but that it is undergoing a profound transformation. It is harder for us to concentrate on longer periods of time, allowing us to get immersed in the process of reading a book, we sometimes have difficulties in memorising information for longer periods of time or we become agitated and often lose the thread of thought. These phenomena are documented in many people who use digital technologies consistently.

Even more, the impact of digital technologies on new generations who are using them, sometimes even from their infancy, seems to be a profound one with major reverberations on how they learn, while some specialists advance the hypothesis that psychic processes are self-reconfiguring and unfolding in a way different from previous generations starting from their neurological basis.

Research data support, at least partially at this time, these premises. Research has shown that there is no doubt about the positive impact of digital technologies on cognitive development, decision-making skills, but also on fine motor skills, diminishing cognitive degenerative processes at the age of old, etc. There are also many documented studies whose results are known to the larger public demonstrating their negative impact, starting with the risks of exposure of small children to digital technologies which can lead to major attention deficits around the age of 7-8 years, and continue with the adverse effects of certain types of content conveyed by this medium with impact, for example, on aggression or the perverse effects of social media on personal identity and self-esteem, etc.

Nearly two decades after the first systematic concerns for the new generations that were born and grew alongside the emergence and evolution of digital technologies, we are faced with an

avalanche of labels that aim to be revealing about their features: *the net generation* (Tapscott, 1998), *digital natives* (Prensky, 2001), *IM generation* (Lenhart, Rainie and Lewis, 2001), *millennials* (Oblinger, 2003), *generation Y* (Jorgenson, 2003; Weiler, 2005; McCrindle, 2006), *gamer generation* (Carstens și Beck, 2005), *Homo Zappiens* (Veen and Vrakking, 2006), *born digital* (Palfrey and Gasser, 2008). Why do we bring them into discussion? Why is it important to know their features? Because these generations are those who question today the relevance, efficiency and quality of the educational systems at international level and push them to a major paradigm shift, from rethinking the learning outcomes to the development of new training methods, the reconfiguration of the training space and so on. Moreover, the signals from employers also seem to be quite serious. They admit that they are facing serious challenges regarding the recruitment and retention of young digital people because they do not know how to approach and communicate with them while being aware of the fact that they will have to make changes in their own business strategy as well as mode and job offer.

In synthesis based on specialty literature, the common features of the practices and dominants of learning the younger generations are: (a) have quick access to information by accessing the Internet; (b) have random (non-systematised) access to information, be able to manage this discontinuous flow of information over time and give meaning and significance; (c) be capable of carrying out parallel processes, have a predisposition to multitasking; (d) open to communication, collaboration and participation, leading to a profound transformation of the roles from passive viewers, event observers, listeners to creators, activists, participants; (e) become motivated by the interest (for/ of) the peer(s) - feedbacks are required, they follow very quickly, require taking positions, etc.; (f) exhibit predilection for images in the detriment of text - iconic imaging skills (e.g. emoticons, etc.) that tend to replace writing skills, displaying another language parallel to the written one; (g) show the need for instant gratification and immediate rewards after completing a task with negative impact on establishing long-term goals (Popovici, 2015).

These conclusions are valid, supported by pertinent evidence from the medical imaging area, as well as experimental research conducted by psychologists, neuroscientists, or education scientists. However, I do not believe that this research captures the subtlety of reality that can

provide the answer to the fundamental question *why the impact of digitised technologies is so profound? Why are we actually talking about an addiction?*

What am I referring to? Reflect for a moment on the independence enjoyed by children over 30 years ago to explore the close environment - the street, the hills and the meadows, the community, etc., to make decisions alongside those of the same age, to communicate and negotiate according to their own rules within the group. Think about the freedom that you had in childhood and which we can hardly imagine that we could offer our own child today, to all those learning contexts alongside the peers, running and playing outside without necessarily having an adult supervision. Every experience of this type responds to your profound needs - *connecting* with others, feeling *competent* in the sense that you could do things without ever hearing the "you cannot do that", "you do not know", "you are too small" and owning *control* of your actions, self-regulating your behaviour and being engaged in decision-making (Ryan & Deci, 2000). Every experience of this type was yet another brick in your true becoming.

This example seems to be at the other end of the spectrum over what digital technologies mean, and yet the personal experiences generated by the latter and by the "streets" respond similarly to the same needs. And to some extent, they respond in the same way, which may seem paradoxical. "The street" as a meeting and experimentation space seems to be closing to today's children, but they find the same freedom and opportunity of exploration in technology-driven virtual spaces. Children of all generations, no matter to which one they belong, come to the world burning with the desire to learn and are genetically programmed with extraordinary learning abilities.

Here lies the understanding of the impact of digital technologies, in that *it provides a space for the manifestation of fundamental needs acutely felt by any human being*.

In conclusion, I would state the idea that digital technologies are able *to recreate an ecology of learning, the well-needed conditions closer to the natural ones (which are much more difficult to access today for various reasons), which support the authentic learning experiences*. From this perspective, the relationship between digital technologies and learning becomes a philosophical one with ethical accents and major implications for the school space as an assumed medium of formal learning. How much does the school meet these needs mentioned above? How much does the child profoundly connect during classes with his/ her peers or the teachers? How much time

is allowed to demonstrate competence, how many opportunities to show that he/ she can? How about his/ her self-regulation and decision-making process?

The questions are rhetorical, but they have challenged me to formulate some premises that can argue the potential of technologies to recreate an authentic learning space:

1. Digital technologies succeed in creating a complex stimulus environment because they involve *multiple stimulation channels* - through sounds, colours, and movement and thus respond to different individual characteristics (learning styles, multiple intelligences, etc.).
2. Digital technologies create an environment that provides an opportunity to meet the natural *connection needs* (to be with others, to be informed, heard, respected, beloved, have a sense of belonging, etc.), *competence needs* (curiosity, to be willing to develop, grow, sense of capability) and *control needs* (self-determination, making decisions, to be the source of ones' own actions) (Ryan & Deci, 2000). It is obvious that there are many issues to be further discussed on the subject (if we would only consider the connection needs and sometimes its illusory satisfaction), but this is not the aim of this article.
3. Digital technologies facilitate *discovery-based learning* (discovery by constantly browsing the Internet in search for information, images, videos, etc., by creating a personalised bricolage / collage of ideas, documents, tools, etc. useful from the point of view of their own needs and goals) and *action-based learning* (without being mediated by too many user guides, while having the opportunity to watch how other people are doing things, then try doing them themselves) with an *in situ* learning experience, as learning becomes situated in action.

Create a *learning environment*, an ecology in which knowledge is socially built and shared. I think this is quite a useful example: we do not become doctors, mathematicians, pedagogues, etc. based only on our knowledge which is traditionally transmitted to us by authority but it is necessary to get immersed in the practice communities that contribute to the development of other professional components. The digital technologies allow this immersion; they support a type of enculturation that provides access to specific ways of seeing, interpreting, and acting.

Conclusions

What does authentic learning mean when using digital technologies? How much does it help us to access this authenticity? Is it real or illusory?

Marshal McLuhan said that we shape our tools and thereafter our tools shape us. It is difficult to achieve a clear demarcation between the mutual determinations developed within this co-dependence between learning and digital technologies, but it is necessary to become aware and reflect carefully on how digital technologies can really enhance our learning approach and make it deeper. The way technology works at the individual level of mental structures is better documented by sound research that provides clear data. Less documented seems to be the synergy of action and the relationship with the fundamental needs that could explain the profound impact they have on our level and implicitly how digital technologies can accommodate coherent learning spaces and even training, developed and sustained relationships between learners, an open, complex and adaptive environmental model according to objectives and needs.

References

Brown, J. (2000). Growing Up Digital. How the Web Changes Work, Education, and the Ways People Learn. *Change*, 10-20. Retrieved on 18 January, 2018, from http://www.johnseelybrown.com/Growing_up_digital.pdf.

Carr, N. (2012). *Superficialii. Efectele internetului asupra creierului uman.* București: Publica.

Popovici, A. (2015, octombrie 26-28). *Eu învăț, tu înveți ... Ce teorii ale învățării funcționează astăzi din perspectiva teoriilor învățării?* Conferința „Acces la literatura științifică: Actualizarea sistemului de învățământ și de cercetare din România. Modele de cercetare și publicare", ediția a IV-a, București, România.

Ryan, M., & Deci, E. (2000). Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. *American Psychologist*, 68-78. Retrieved on 8 January, 2018, from https://selfdeterminationtheory.org/SDT/documents/2000_RyanDeci_SDT.pdf.