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WHAT IS LOST WHEN TECHNOLOGY WINS? A STUDY ON THE BENEFITS AND DRAWBACKS OF A TECHNOLOGY-CENTERED APPROACH TO LEARNING

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Abstract

*The article is aimed at discussing the benefits and disadvantages brought to the learner by an approach to education which has become the norm nowadays – one revolving around technology and seeking the new in everything from teaching methods to content and delivery of the course. The all-encompassing, pervasive technological mindset we encounter in academic as well as business environments seems to have little doubt as to the validity of the pursuit of what we termed a **technology-centered approach to learning**. The current paper's goal is to present, as objectively as possible, the advantages and drawbacks of such an approach, as well as the possible consequences that might ensue for future generations of learners.*

Keywords: technology, technology-centered learning, mobile learning, early learning, brain development, CALL, TELL, digital competences

1. Introduction

The article's goal is to present the advantages and disadvantages to the learner of the mainstream approach to education nowadays – the one focusing on technology, which promotes newness in teaching methods as well as content and delivery of the subject taught. We think that the

technological mindset we meet in academic as well as business environments often lacks a solid conceptual and experimental foundation. Given the mind-blowing advance in technology in recent years, the fact that the science behind the claims of educators trying to promote new technologically-inclined methods of learning has yet to catch up with these swift and unexpected changes is not surprising.

The paper attempts the presentation of a picture of the current situation which is as objective as possible, introducing both information and opinions drawing attention to the dangers of the exaggerated use and exposure to technology, especially in the case of children and young learners, as well as an overview of the main benefits of the use of technology in learning environments, with a focus on mobile learning.

At the same time, the current work benefits of a double perspective – we wanted to show the opinions of both educators (fellow colleagues in the BUES, but also other opinions of teachers from abroad) and students, whom we asked to comment on the impact of technology on learning, during research conducted this semester (the 2016-2017 academic year) among first year students in Finance and Banking, as well as Master's students in Accounting, Control and Expertise in the BUES. A selection of their responses will be published here, along with our comments.

2. The drawbacks

To begin with, let us briefly present some of the main disadvantages brought about by technology in children's lives. A recent article¹ focusing on the negative sides of technology finds the following arguments.

Firstly, technology **changes the way children think**, in the sense that using technology can change a child's brain, as the use of technology can alter the actual wiring of the brain.

*There is, however, a growing body of research that technology can be both beneficial and harmful to different ways in which children think. Moreover, this influence isn't just affecting children on the surface of their thinking. Rather, because their brains are still developing and malleable, frequent exposure by so-called digital natives to technology is actually wiring the brain in ways very different than in previous generations. What is clear is that, as with advances throughout history, the technology that is available determines how our brains develop. For example, as the technology writer Nicholas Carr has observed, the emergence of reading encouraged our brains to be focused and imaginative. In contrast, the rise of the Internet is strengthening our ability to scan information rapidly and efficiently.*² (Taylor: 2012)

What follows from the quoted fragment from Psychology Today is the fact that we are actually dealing with a generation benefiting of – or suffering from, depending on our perspective – a whole new way of thinking, no longer focused on imagination and creativity. These were fueled and enhanced in older generations by reading, an activity the majority of children nowadays have replaced with other, more passive ways of engaging the brain – in the case of watching TV, or videos on various types of screens, from tablets to I-pads and the all-pervasive smartphones. Moreover, younger generations are deficient when it comes to focusing their attention on a specific subject, and have limited attention spans, as we shall see in the following. For now, let us see some worrying statistics.

More than a third of children under the age of two use mobile media. That number only increases as children age, with 95% of teens 12-17 spending time online. (DeLoatch: 2015)

¹ DeLoatch, Pamela, *The Four Negative Sides of Technology*, <http://www.edudemic.com/the-4-negative-side-effects-of-technology/>, May 2, 2015

² Taylor, Jim, *How Technology is Changing the Way Children Think and Focus*, <https://www.psychologytoday.com/blog/the-power-prime/201212/how-technology-is-changing-the-way-children-think-and-focus>, Dec 04, 2012

Why are the figures troublesome? As the next fragment shows, these habits have important negative effects on attention and memory.

In generations past, for example, children directed considerable amounts of their time to reading, an activity that offered few distractions and required intense and sustained attention, imagination, and memory. The advent of television altered that attention by offering children visual stimuli, fragmented attention, and little need for imagination. Then the Internet was invented and children were thrust into a vastly different environment in which, because distraction is the norm, consistent attention is impossible, imagination is unnecessary, and memory is inhibited. (Taylor: 2012)

Thus, the effects of new technologies are not restricted to consequences on children's imagination, but extend as well to memory and attention, by rendering memory useless, as information is widely available, and by inhibiting and fragmenting attention. Why is this so bad? Because the brain will only work efficiently if you use it, and will develop those qualities and skills which are used the most often. When attention is not focused, the consequences will be lower academic performance, poorer results, which in turn might lead to a vicious circle – students who are underperforming will gradually lose interest and motivation, and stray further and further from any academic pursuits, thus limiting their education, which will then diminish their chances of finding suitable (and higher paid) employment.

Moreover, technology can impact negatively children's emotional development.

Using technology can affect a child's ability to empathize. A study on two groups of sixth graders found that kids who had no access to electronic devices for five days were better at picking up on emotions and nonverbal cues of photos of faces than the group that used their devices during that time.

Overuse of technology can also affect a child's own mood. A report from the United Kingdom revealed that kids who use computer games and their home Internet for more than four hours do not have the same sense of wellbeing as those who used that technology for less than an hour. One expert explained that with less physical contact, children might have difficulty developing social skills and emotional reactions. (DeLoatch: 2015)

So, what are the consequences of exposure to technology for learning? Is technology the invaluable tool it is presented to be?

In fact, studies have shown that reading uninterrupted text results in faster completion and better understanding, recall, and learning than those who read text filled with hyperlinks and ads. Those who read a text-only version of a presentation, as compared to one that included video, found the presentation to be more engaging, informative, and entertaining, a finding contrary to conventional wisdom, to be sure. Additionally, contrary to conventional educational wisdom, students who were allowed Internet access during class didn't recall the lecture nor did they perform as well on a test of the material as those who weren't "wired" during class. Finally, reading develops reflection, critical thinking, problem solving, and vocabulary better than visual media. (Taylor: 2012)

3. Technology and language learning

When it comes to language learning in particular, experts seem to agree that this is the area where technology can be beneficial par excellence. With an English bias though, since English is after all the latest lingua franca of the world and its web.

From a sociological viewpoint inspired by Bourdieu (1984), technology is one element that shapes social events, practices and structures. Changes in technology trigger changes in 'habitus', the way we

are and act without necessarily being aware of it, therefore language learning methods and theories change over time keeping pace with technological developments, in a relationship of reciprocity.

Warschauer and Kern (2000) and later Bax (2003) draw parallels between different language learning perspectives and changes in educational technologies, highlighting three major historical approaches with regard to CALL (computer assisted language learning): structural or closed, communicative or open, and integrative or integrated (Warschauer vs. Bax terms). At the dawn of educational technology, in the 1960s, language was viewed as a formal system of structures and was generally taught mainly through drills and practice methods. This is reflected in the then emerging use of audio-lingual courses and CALL programmes which focused on phonological drills and grammar translation. In the 1990s, the linguistic perspective changed from syntagm to paradigm, favouring the individual learner and the internal construction of knowledge rather than an external system of rules. Consequently, communicative teaching methods became popular and open interaction became the norm even in CALL. After the turn of the new millennium, our lives have become inseparable from multimedia, the internet, digital devices, and social media. It is therefore inevitable that teaching methodology changes again and integrates the above mentioned results of the technological boom into its core, CALL included.

In favour of integration, Walker and White (2013) argue that

... technology needs to be seen within the context of the activity system that it mediates. Activity is carried out by people (subjects) working towards ends (objects) and mediated by tools within the context of culture, social rules, and sharing of workload. None of these elements exist in isolation and a change in any one element will have an impact on the others.

Therefore, as technology influences social and cultural changes, it also transforms the nature of language skills learners need to use, and it must eventually impact on teaching and learning practices.

However, CALL seems to be outdated already, and TELL (technology enhanced language learning) is suggested instead as a more adequate term for an era when technology is ubiquitous under so many different shapes and sizes. The fact of the matter is that technology no longer assists language learning but IS “part of the environment in which language exists and is used” (Walker and White, 2013), an increasingly significant part, we would add.

Nowadays, both information and communication rely heavily on digital competences. The advent of Web 2.0 has redefined the role of language users from mere recipients to creators, contributors, editors or sharers of information. Moreover, information is commonly imparted in a multimodal way, combining text with images, audio or video links, and therefore requiring the use of different skills. In short, this is the era of ‘digital natives’.

It is only natural then to adapt methodology to their learning needs and styles. Learners now thrive on visual stimuli, short-span activities, games, and immediate rewards; the technology is available. Actually, the very technology that generated such changes in learning patterns can become a tool for acquiring the necessary functional skills in a language learning environment. “Using technology in ways which genuinely support language learning enables learners to become more independent, collaborative, and engaged.” (Walker and White, 2013)

4. Mobile learning

Nowadays, technology is being created and updated at a hectic pace, and growing more ubiquitous and useful than ever. The use of mobile devices has grown to such an extent over recent years that it has revolutionized the education and learning paradigms. ‘Mobile learning’ is no longer a new concept and everyone agrees that it offer learners mobility, in the sense that they are able to engage in educational activities without the constraints of having to do so in a predefined physical location.

Furthermore, mobile learning is considered by scholars such as Kukulska-Hulme and Traxler (2005, 31) “personal learning, which could be remote and individual, or social and collaborative.”

According to Koole (Ally, 2009, 25) mobile learning is a process which results from the junction of three elements: mobile technologies, human learning capacities, and social interaction. The author developed the FRAME (The Framework for the Rational Analysis of Mobile Education) model.

Collectively and individually, learners consume and create information. The interaction with information is mediated through technology. It is through the complexities of this kind of interaction that information becomes meaningful and useful (Koole apud (Ally,2009,26)).

All three elements from Koole FRAME model are represented in the figure below:

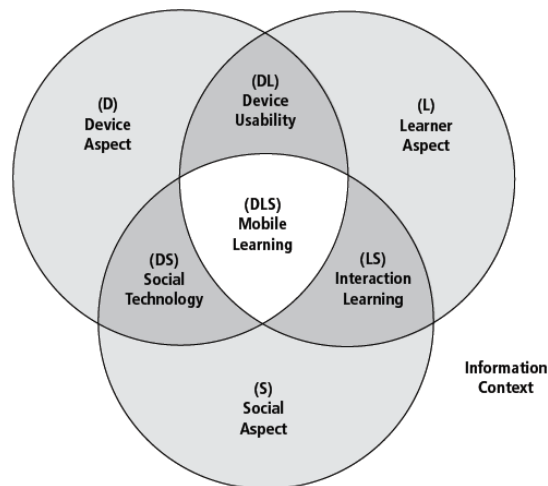


Figure 1 Koole FRAME model (reproduced from Ally, 2009)

The three outer circles represent the device (D), learner (L), and social (S) aspects, whereas the intersections where two circles overlap cover attributes that belong to both aspects.

The device aspect (D) refers to the physical, technical, and functional characteristics of a mobile device. (...) The learner aspect (L) takes into account an individual’s cognitive abilities, memory, prior knowledge, emotions, and possible motivations (...).The social aspect takes into account the processes of social interaction and cooperation. Individuals must follow the rules of cooperation to communicate – thereby enabling them to exchange information, acquire knowledge, and sustain cultural practices. Rules of cooperation are determined by a learner’s culture or the culture in which an interaction take place. In mobile learning, this culture may be physical or virtual. (Koole, apud Ally, 2009, 28-31)

The FRAME model help practitioners and researchers to leverage the mobile learning benefits and to better comprehend its complex nature in a more practical description. McQuiggan et al. (2015, 305) goes further by stating that “educational data, whether it comes from school systems, mobile applications, or other technology-based resources, has immense power to transform our education system for the better.” The outstanding benefits of educational data are many. Here are a few listed:

- *accessibility & immediacy*
- *easy access*
- *portability & increased mobility.* Learning is not restricted to fixed locations any more. There is no time or space restrains on mobile learning methods
- *fun, relaxed and (in)formal virtual learning environment.* Students nowadays prefer multimedia to stay engaged in a learning environment therefore most of them log in to platforms such as TED Talks, for example.

- *empowerment by digital technology*. Students appreciate more control over their learning sessions (i.e. being able to select the learning content and which modules to complete first).
- *self-learning and self-improvement*
- *availability and flexibility*. The mobile platforms available online provide flexibility for learners who are able to access courses on the device of their choice (e.g. smartphones, tablets, notebooks, notepads, etc.). It can reach any remote or far off areas of the country or world.
- *dynamic alternative mode of learning (interesting and motivating)*. Learners' engagement rate is higher when courses are delivered via a mobile format due to the animated graphics, videos, infographics, imaginative illustrations.
- *learners set their own learning pace*.
- *learners benefit of online collaborative learning via instant messaging*
- *the interactive elements that keep learners engaged*

As McQuiggan et al. (2015, 327) states “mobile learning is not about novelty or cool apps, but rather redefining pedagogy to capitalize on the affordances of mobile devices to empower students”. Consequently mobile learning environments enable “empowerment to take many forms: it lets students take control of their own learning, personalize their experience, pose an authentic problem, provide a meaningful purpose or audience, or connect with others”.

5. Students and educators' perspectives

5.1. What teachers think

As mentioned in the introduction, the present article benefits of a double perspective – we wanted to show the opinions of both educators and students, whom we asked to comment on the effects of technology on learning.

We shall start by introducing teachers' views on the matter, by reviewing the results of studies presented in a New York Times article.³ The first study was conducted by the Pew Internet Project, a division of the Pew Research Center that focuses on technology-related research. The other comes from Common Sense Media, a nonprofit organization in San Francisco that advises parents on media use by children.

“I’m an entertainer. I have to do a song and dance to capture their attention,” said Hope Molina-Porter, 37, an English teacher at Troy High School in Fullerton, Calif., who has taught for 14 years. She teaches accelerated students, but has noted a marked decline in the depth and analysis of their written work.

“They need skills that are different than ‘Spit, spit, there’s the answer,’ ” said Lisa Baldwin, 48, a high school teacher in Great Barrington, Mass., who said students’ ability to focus and fight through academic challenges was suffering an “exponential decline.” She said she saw the decline most sharply in students whose parents allowed unfettered access to television, phones, iPads and video games.

“I’m tap dancing all over the place,” Mr. Mendell said. “The more I stand in front of class, the easier it is to lose them.” (Richtelnov: 2012)

We think it is clear, from the answers quoted above, that teachers are extremely worried about the effects technology has on their students, and that the majority of their opinions highlight the negative

³ Richtelnov, Matt, *Technology Changing How Students Learn, Teachers Say*, <http://www.nytimes.com/2012/11/01/education/technology-is-changing-how-students-learn-teachers-say.html>, November 1, 2012

impact of technology on matters like ability to focus, attention and learning skills. The figures are quite telling:

... nearly 90 percent said that digital technologies were creating “an easily distracted generation with short attention spans.”

Similarly, of the 685 teachers surveyed in the Common Sense project, 71 percent said they thought technology was hurting attention span “somewhat” or “a lot.” About 60 percent said it hindered students’ ability to write and communicate face to face, and almost half said it hurt critical thinking and their ability to do homework.

The Pew research found that 76 percent of teachers believed students had been conditioned by the Internet to find quick answers. (Richtelnov: 2012)

Moreover, the quoted studies ascertain that there was little difference in how younger and older teachers perceived the impact of technology. In the interviews mentioned, teachers described what might be called a “Wikipedia problem,” that is, the fact that students “have grown so accustomed to getting quick answers with a few keystrokes that they are more likely to give up when an easy answer eludes them.” (Richtelnov: 2012)

To sum up, the views of educators on the matter of technology as a tool for learning, or as a hindrance to education – depending on the perspective – seem to tilt the balance strongly in favor of a more traditional view on learning, in which technology would play a role, as this cannot be avoided in this day and age, but would be limited to situations when the learner cannot be aided by the old-fashioned methods – like using live courses, teachers and books, and as much face-to-face contact as possible.

5.2. What students think

It would undoubtedly be extremely interesting to see the views held by the beneficiaries of the learning process, in most cases belonging to generations very different from those of their educators, generations on which technology has certainly had indelible effects.

As mentioned previously, the research on students’ views was conducted this semester (the 2016-2017 academic year) among first year students in Finance and Banking, from the English or Romanian sections, as well as Master’s students in Accounting, Control and Expertise in the BUES, and was done by asking them to answer in writing an open question: ‘*What is the impact of technology on learning?*’.

Not surprisingly, the results of our research have shown that, in the vast majority of cases, students hold opinions very different from those of their teachers. Their answers demonstrate overwhelmingly a positive view on technology, and focus on the concrete aspects pertaining to technology – more specifically, they give very concrete examples of tools they have used or could use for help in their learning process, from websites to search engines and smartphone applications.

We shall give in the following some excerpts from students’ essays proving the above point. We would like to mention the fact that we kept students’ answers as they were, without correcting language/grammar mistakes. These do not impede, however, the understanding of their views.

The positive impact such as the projectors or computers are very useful now for the teachers to help us learn concepts easily. Also for me the advantages are that I’m more excited to learn and it also helps me with my busy schedule. (Master’s student, 1st year, Accounting, Control and Expertise)

I think that the technology is useful because it helps us to find easier the information that we need in a short time. Also, we can share the courses on the internet and we can communicate with colleagues and teachers.

Technology has negative effects, too. Because in our days the technology exists everywhere, we depending on it and in some cases we don't communicate face to face only on the internet. A lot of us are spending a whole day on the internet and that thing makes us to reading less or not go to the theater. Is easier to see a movie in bed that go to the cinema. (Master's student, 1st year, Accounting, Control and Expertise)

...technology can affect the way that students are learning, or more well say, they are not actually learning anymore, instead of this just copy and paste things that they've should think about with their own minds. (Master's student, 1st year, Accounting, Control and Expertise)

...At the same time when you sit in front of the computer and start browsing you forget to stop. (Master's student, 1st year, Accounting, Control and Expertise)

I think technology is very important nowadays because it helps people to access information faster than a book, a magazine or other sources of information. Childrens are attract of technology because it's interactive, easy to use and funny...Technology is already a part from their lives and it helps them to develop capacity of thinking and improve their language or to learn other foreign languages. (Master's student, 1st year, Accounting, Control and Expertise)

Nowadays, technology acts more as a distraction from the real world, but for those willing to learn, it's an opportunity to develop.

First of all, the amount of data that can be found on the internet, using a laptop or a smartphone, is huge. With just 1 click away, everything you're looking for is there. Anyone can find out anything. By using technology, in the correct way, people can learn things by themselves. It's all about their will to look up useful things rather than spending 2 hours scrolling through their Facebook feed. (1st year Finance student, English section)

For the 'bad' argument, some people might say that technology made humans extremely lazy. The fact that anyone can find everything on the internet had somehow stopped people's need of informations, and they are not as curious and motivated as before to learn and search themselves different subjects. But this depends on each person's character, and it has always been like this. If one is motivated to learn, nothing can stop him. On the contrary, technology should be seen as a revelation for those who are thirsty for knowledge. (1st year Finance student, English section)

The technology facilitates the learning process so much that the youngs no longer make any effort to learn. (1st year Finance student, Romanian section)

...I am an artist, I enjoy to draw ..., and I couldn't reach to this level without a simple pencil and a sheet of paper, day by day, without proper courses or technology...Technology is very useful, many aspects of this life, in contemporary days, wouldn't be possible, and that is great, good. But, however, despite technology uncover some answers, shrouded some answers although. People tend to forget how to learn...(1st year Finance student, Romanian section)

6. Conclusions

We think that, despite their love for technology and the fact that they grew up with it, surrounded by screens of various sizes, and effortlessly navigating, in most cases, the troubled seas of a world pervaded by technology in all its aspects, the students' answers, regardless of the level of education or of the language level, are liable to give us hope. Though focusing in most cases on the positive aspects of technology, the opinions our students express show a high level of maturity and the ability to see matters objectively. Their answers – candid, mature and, we must admit it, funny at times – leave us with the impression that many of them did not fall in the trap set for them by the negative aspects of technology and did not – in one student's words – *forget how to learn*. As educators, we think this is good enough.

To paraphrase and ‘technologize’ Confucius, learning without technology is labour lost, while technology without learning is perilous.

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