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Teaching on the Run – Learning on the Go

In an attempt to prepare students to meet the demand of the future workforce, and also to address the dropout crisis, educators are looking for new ways to integrate virtual worlds into the curricula. Digital economy finds its way to the tech-savvy youth. The number of computers, smartboards, and all kinds of widgets serving digital education are on the rise. Still, on the most part, our academic institutions continue to follow a 19th-century path based on rote learning and high-stakes testing. The paper intends to summarize some of the dominating notions that define the prevailing narratives of these issues. It also aims to explore the discrepancy between the imagined and the real learning environment while shedding light on the 2015 PISA results that show that technology alone will neither improve pupils' achievement nor will it help prepare them for the 21st-century labor market needs.

Introduction

Children's digital footprints are now taking shape from a very young age. Parents and grandparents upload videos of children, write blogs, or post photos (sometimes even ultrasound scans) about babies who may not even be born. An introduction study commissioned by AVG finds that 92% of children have an online presence by the time they are two compared to 73% of children in the EU. 7% of babies and toddlers have an email address created for them by their parents and 5% have a social network profile[2]. Research by the NPD Group shows tha**t** 82 percent of children ages 2 to 5 play games on video-game consoles. 4% of the children aged 3-5 (and this data is true for Europe) can tie their shoes and 54% use a tablet fairly well[3]. In Hungary today the internet penetration in households is about 74%, the mobile penetration is relatively high 118%. Speak Up 2008" report concluded that today's secondary school students see their educational futures built almost entirely around technology. It also suggests that the

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[2] Study: 92% of U.S. 2-year-olds have online record [online] https://www.cnet.com/news/study-92-of-u-s-2-year-olds-have-online-record/ [10.01.2018]

[3] The top 25 baby names inspired by video game characters [online] https://www.gameskinny.com/s2x4c/the-top-25-baby-names-inspired-by-video-game-characters [12.03.2016]

elementary school kids are restless with the traditional forms of learning and schools are eager to incorporate into their educations the electronic tools that have become omnipresent in children's everyday lives: their smartphones, laptop, computers, iPods, or MP3 players (Daly, 2008, p.7). The vision of a 21st-century learner (back in 2008) has become reality. Classrooms are becoming digital with students using the computer to play mathematics-learning games and reading interactive e-textbooks. Educators might criticize but cannot afford to dismiss the overflow of computers and social media into students' daily lives. The study will cover two issues: it discusses the challenges of integrating virtual worlds into the curricular while shedding light on the latest PISA results and questioning the long-prevailing supposition based on the euphoria from the dot-com frenzy era that ”anything that digital would work”.

The demand for good education is on the rise

It is common knowledge that technology is moving so fast that we don't know what jobs will be available in the future. Consequently, university students sitting in brick and mortar classrooms are being prepared for jobs that might not even exist by the time they graduate. According to some predictions, our school system will completely change in 10-50 years[4]. More prognoses have rarely been related to other fields than to education, and in relation to the new digital world with robots. According to the *Insider* among the jobs that will disappear within 20 years from now will be the cashier, the fast food worker, the retail jeweller, the mail carrier, or the telemarketer (Ryerson, 2019). On the other hand, the *World Economic Forum* gives an account of the 10 top jobs that did not exist 10 years ago such as app developer, social media manager, uber driver, cloud computing specialist, or YouTube content creator (Hallett–Hutt, 2016). The most commonly cited statistics come from a 2013 Oxford study that says that 47% of US jobs are at high risk of automation in the next few decades (Frey and Osborne, 2013), while an OECD study points out that 9% of jobs in the organizations’ 21 member countries are automatable[5]. And the skills that will save us from full digitalization (automation) will be the ability of critical thinking, active listening, and emotional intelligence. The generation of the New Millennials, along with others of their generation, will expect to use digital resources, and to be trained in their use. And as technologies grow increasingly sophisticated, and we learn more about how students learn and what pedagogical methods work best, and in the end, all

[4] Online Learning. The New Classroom: Virtual Education Goes Mainstream. The Chronicle of Higher Education. November 5, 2012. B4. [online] http://library.cotr.bc.ca/Documents/NewClassroomChronicle2010.pdf [11.11.2018]
[5] Future of work and skills [online] https://www.oecd.org/els/emp/wcms_556984.pdf [10.01.2018]

institutions will use technologies to improve students' learning. Experts are stressing different opinions on reforms addressing traditional versus online teaching but most agree that the current education system designed in the 19th century will not help students thrive in the 21st. It means that education and educators are faced with serious challenges, a lot more serious than we have ever thought of.

The task is not less than to give adequate answers to the challenges of the digital economy while keeping up or improving the quality of education. The committee on defining deeper learning and 21st-century skills in their report on *Education for life and work* promote the importance of "deeper learning" that is the blending of both knowledge and skills called "21st-century competencies". The end product is "transferable knowledge"-- which often involves shared learning-- and that makes the students capable of taking what was learned in one situation and apply it to new ones ("Front Matter", 2012). Levy and Murnane (2004) argue that demand is growing for non-routine problem solving and complex communication competencies since it is predicted that jobs requiring low or moderate levels of competence will continue to decline in the future. Thus the authors recommend that schools teach complex communication and problem-solving competencies. When it comes to the importance of problem-solving, the University of Stanford is breaking with traditions by immersing faculty and students in interdisciplinary work and learn through problem-solving. They see their success in their robust "liberal-arts environment" and collaboration across schools and disciplines (McMurtrie, 2015).

We are expected to change. Old terms have been modified and renamed: "skills" become "competences", teachers are transformed into coaches, tutors or facilitators, who are to report back to "helicopter parents"[6], while the buzz-words are *LMS, web apps,* and *mobile computing* technologies. As a result of the ed-tech boom in the '90s, huge amounts of money have been injected into education projects labelled "digital". In Hungary, in 2016 Internet access at school is above the OECD average. 95.6% of the students have an access to computers at school, while the OECD average is 93.1%. 63.3% of students actually use computers and 69.5% use the Internet. Educators are trying hard to keep up with the rapid changes in technology and experiment with the new blessing (or curse) devices and applications. According to 2005/2006 statistics 494 teachers had been reported to use the Internet regularly in the classroom, and this number more than doubled by 2015/2016 (Hagymásy-Könyvesi (Eds.), 2017).

[6] Overprotective parent who discourages a child's independence by being too involved in the child's live. Based on: Helicopter parent [online] http://www.dictionary.com/browse/helicopter--parent [10.01.2018]

The advocates of digital education and dedicated users of digital material put the emphasis on its flexibility, and facilitatation of ”learning anytime, anywhere”, "learning on the go” option whilst meeting the demand of the tech-savvy generation. Besides, they say, it supports teamwork, informal peer learning, practical experimentation, and develops information literacy skills. Digital experts highlight the potential of problem-solving through a combination of contexts, activities and actions, and call attention to the ”fun” part, which is about transforming learning into an enjoyable experience.

Digital know-how

Several teaching resources with practical advice are available for educators who want to turn the use of the Internet to their own advantage and want to educate ”digitally literate” students. Any primary school teacher, even trainees know that digital literacy involves mastering many different skills, from analyzing how texts are organized to understanding the writer’s reasons for writing. Similarly, digital literacy should be understood as a range of separate sub-skills, or literacies. Literacy is more than just the ability to read and write. The number of literature on the 21st-century learning frameworks on digital literacies is endless[7].

Eventually, information-communication technology has revolutionized education, modified teachers’ roles and instruction methods. In Volume 66 of the *ELT Journal,* Nicky Hockly (2012) groups digital literacies under four main categories – language based, information based, connection and (re-)design based. She explains that information-based literacies cover ”search literacy”, which is about finding the right search terms digitally, and once we have found that information we have to judge its reliability. Hockly further defines “filtering literacy”, that is to know how to manage the much complained “information overload”– the problem of being faced with too much information. At the same time, many of the students are surfing the net and using their new apps in class rather than their course books. A teacher, therefore, may become less an oracle and more an organizer and guide, someone who adds perspective and context, finds the best articles and research, and sweeps away misconceptions and bad information. Software developers are exploring the potential of virtual worlds for educational purposes, but there are experts and scholars who are skeptical. There is not enough research available for educators to better understand and fully utilize those virtual spaces. The most common criticism towards new learning platforms is the lack of hard

[7] Partnership for 21st century learning. [online] HYPERLINK "http://www.p21.org/our-work/p21-framework" http://www.p21.org/our-work/p21-framework [10.01.2018]

evidence: e.g. small sample size, no control groups, no estimates of cost savings. While opinions differ regarding the T/L outcomes, there appears that technology alone will not save education. In a debate in the *Economist* about whether new technology and media can add to the quality of education, Sir John Daniel, president, and CEO of the Commonwealth of Learning noted,

"*[T]here is the quest for the magic medium, the ultimate technology that will revolutionize education. Yesterday it was the Internet; today it is Open Educational Resources. But there is no magic medium and never will be. Each technology has its strengths. The task is to use them to create a world where education of quality is abundantly available"* (Daniel, 2007).

More computers, more digital entertainment

The supporters of the ed-tech boom are happy to find that digital apps can provide students with a virtual arena that can support the acquisition of many of the necessary literary skills. There is also evidence that proficiency in skills acquired in virtual worlds may pay off in the physical world. Educators are looking for new ways to integrate virtual worlds, including games into the curriculum[8]. Meanwhile, Iowa State University released a study and found that children who played video games and watched TV faced "greater attention problems" while in school. Research claims that there is a correlation between high-volume gameplay and Attention Deficit Disorder. The findings reveal that exposure to screen media and video games was associated with greater attention problems in middle childhood or late adolescence (Swing et al., 2010). In the meantime the Hungarian Government has launched its "Digital Well-being Program 2017" according to which 170,000 teachers will be provided with 70,000 IT devices, 45,000 laptops, i-pads, smart TV-s, and projectors worth 24.5 billion HUF. Computer-assisted teaching is on the go, and appears to be ready to answer the challenges of 21st century global education. Unfortunately, this latter issue of meeting the global requirement of education did not live up to the expectations of either the public, or the governments in many countries when the PISA results were released in 2015. It seems that there is a paradox between computer and Internet access and the PISA results, which is not exclusively a Hungarian phenomenon.

[8] Mozaik: Education [online] http://www.mozaweb.com/hu [10.01.2018]

2015 PISA results

Although PISA cannot identify a clear cause and effect relationship between the use of digital material, computers and students' outcomes, it can give educators, education policymakers, and the taxpayers a picture about the position of their education system compared to other countries. Test results for 2015 indicate that the performance of students in many OECD countries shows a steady decline in core subjects. Asian countries topped the rankings across all subjects, and Singapore was the top performing country across all three core subjects *(Table 1).*

	Science		Reading	
	Mean score in PISA 2015	Average three-year trend	Mean score in PISA 2015	Average three-year trend
	Mean	Score dif.	Mean	Score dif.
OECD average	493	-1	493	-1
Singapore	556	**7**	535	**5**
Japan	538	3	516	-2
Estonia	534	2	519	**9**
Chinese Taipei	532	0	497	1
Finland	531	**-11**	526	**-5**
Macao (China)	529	**6**	509	**11**
Canada	528	-2	527	1
Viet Nam	525	-4	487	**-21**
Hong Kong (China)	523	**-5**	527	-3
B-S-J-G (China)	518	m	494	m
Korea	516	-2	517	**-11**
New Zealand	513	**-7**	509	**-6**
Slovenia	513	-2	505	**11**
Australia	510	**-6**	503	**-6**
United Kingdom	509	-1	498	2
Germany	509	-2	509	**6**
Netherlands	509	**-5**	503	-3
Switzerland	506	-2	492	-4
Ireland	503	0	521	**13**
Belgium	502	-3	499	-4
Denmark	502	2	500	3
Poland	501	3	506	3
Portugal	501	**8**	498	4
Norway	498	3	513	**5**
United States	496	2	497	-1
Austria	495	**-5**	485	-5
France	495	0	499	2
Sweden	493	**-4**	500	1
Czech Republic	493	**-5**	487	5
Spain	493	2	496	**7**
Latvia	490	1	488	2
Russia	487	3	495	**17**

Table 1. PISA 2015a results I
Source: PISA 2015 Results (Volume I)
[folytatás a következő oldalon]

Luxembourg	483	0	481	**5**
Italy	481	2	485	0
Hungary	477	**-9**	470	**-12**
Lithuania	475	-3	472	2
Croatia	475	**-5**	487	**5**
CABA (Argentina)	475	**51**	475	**46**
Iceland	473	**-7**	482	**-9**
Israel	467	**5**	479	2
Malta	465	2	447	3
Slovak Republic	461	**-10**	453	**-12**
Greece	455	**-6**	467	**-8**
Chile	447	2	459	5
Bulgaria	446	4	432	1
United Arab Emirates	437	**-12**	434	-8
Uruguay	435	1	437	**5**
Romania	435	**6**	434	4
Cyprus[1]	433	-5	443	-6
Moldova	428	**9**	416	**17**
Albania	427	**18**	405	**10**
Turkey	425	2	428	**-18**
Trinidad and Tobago	425	**7**	427	**5**
Thailand	421	2	409	**-6**
Costa Rica	420	-7	427	**-9**
Qatar	418	**21**	402	**15**
Colombia	416	**8**	425	6
Mexico	416	2	423	-1
Montenegro	411	1	427	**10**
Georgia	411	**23**	401	**16**
Jordan	409	**-5**	408	2
Indonesia	403	3	397	-2
Brazil	401	3	407	-2
Peru	397	**14**	398	**14**
Lebanon	386	m	347	m
Tunisia	386	0	361	**-21**
FYROM	384	m	352	m
Kosovo	378	m	347	m
Algeria	376	m	350	m
Dominican Republic	332	m	358	m

Table 1. PISA 2015a results I
Source: PISA 2015 Results (Volume I)

2015 PISA results show steady decline in scholastic performance of Hungarian students *(Table 2)*:

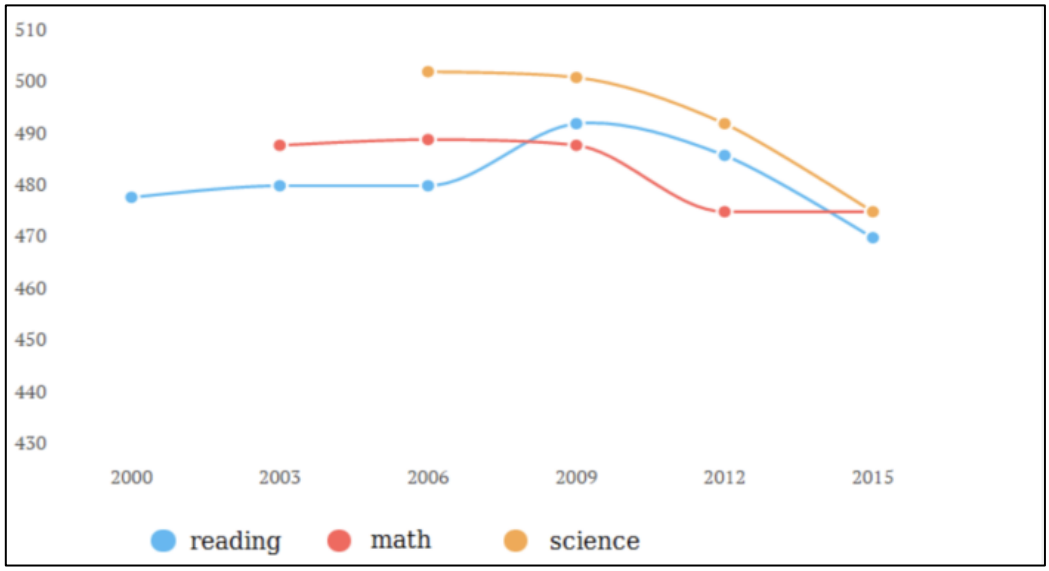

Table 2. PISA 2015 results II
Source: Budapest Beacon[9]

The results of the Hungarian students in core subjects 2015 are the following *(Table 3):*

Maths 477	OECD average 490
Reading 470	OECD average 493
Science 477	OECD average 493
Collaborative problem solving 477	OECD average 500

Table 3. PISA 2015b results III
Source: PISA 2015b Results (Volume I): Excellence and Equity in Education

In 2015 the OECD moved from paper-based evaluation to computer-based evaluation, which raised the issue of comparability based on country differences with computer use. Correlational analyses revealed that changes in the mode of delivery were not responsible for the weaker performance of students. Spending more on computers and classroom technology does not improve pupils' performance, says a global study from the OECD. OECD's report *Students, Computers and Learning: Making the Connection* (2015) examines the impact of school technology on international test results and concludes that education systems which have

[9] *Budapest Beacon. [online]* https://budapestbeacon.com/2015-pisa-results-shows-steady-decline-in-scholastic-performance-of-hungarian-students/ [10.01.2018]

invested heavily in information and communications technology have seen "*no noticeable improvement" in PISA test results for reading, mathematics or science.* Elena C. Papanastasiou examines the relationship between computer use and students' science achievement and highlights that it is not computer use itself that has a positive or negative effect on the science achievement of students, but the way in which computers are used (Papanastasiou et al., 2003). The PISA 2015 results do indicate that there is a connection between computer use in the classroom and students' achievement. Those students who use tablets and computers very often tend to do worse than those who use them moderately. The best-performing East Asian countries have been very cautious about using technology in their classrooms *(Table 4).*

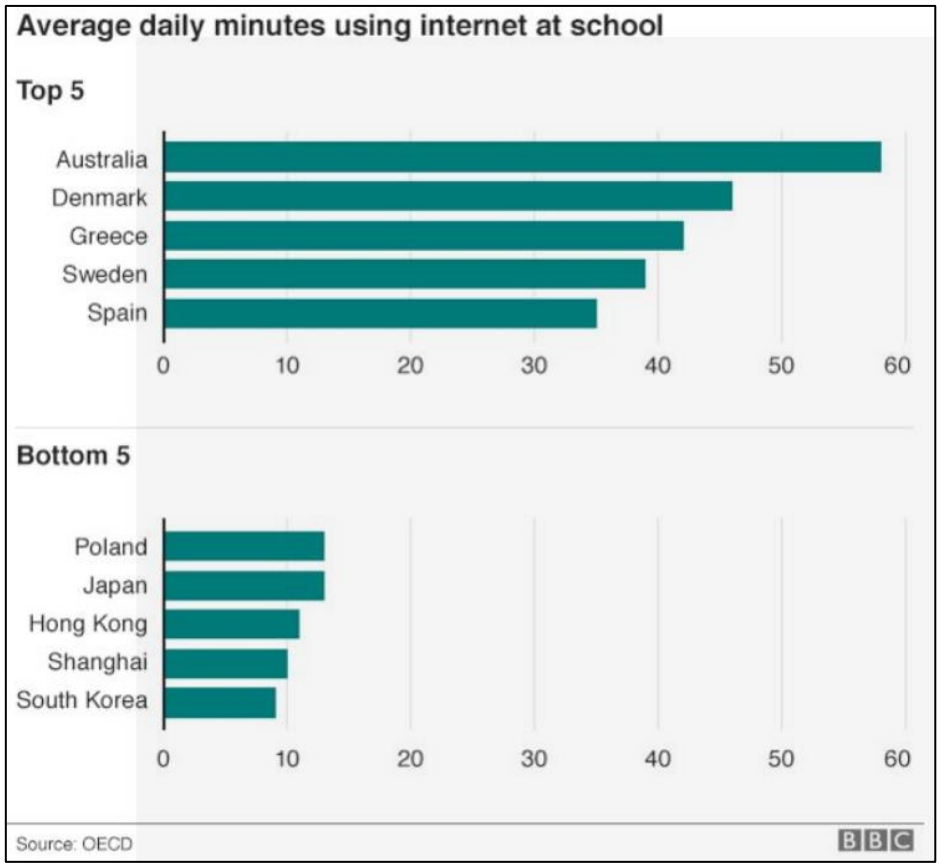

Table 4. How computers effect results
Source: Coughlan, S. (2015)

The 2015 test featured a computer-based reading section, which differed from the typical "paper-and-pencil" PISA reading exam in that it simulated situations students would come across in an online setting, including "navigat[ing] through and across texts by using such tools as hyperlinks, browser button or scrolling." As read in the OECD summary "*students with good reading skills, regardless of their background, scored better at the tests since they have a much easier time finding their way around the Internet"* (Coughlan, 2015). Apparently, it is more

difficult to build digital literacy if students do not have the foundational reading skills necessary to evaluate source quality or draw inferences from multiple web pages. It is worth noting that top performers in this section show proficiency in certain digital literacy skills, such as *"evaluat[ing] information from several sources, assessing the credibility and utility of what they read using criteria that they have generated themselves, ... [and] solv[ing] tasks that require the reader to locate information, related to an unfamiliar context, in the presence of ambiguity and without explicit directions"* (Song, 2016).

Conclusion

Undoubtedly, the labour market demand for a highly qualified workforce with transferable skills and competences has risen over the past two decades. There is some bare evidence that employers value and reward a rather diffused mix of cognitive, intrapersonal and interpersonal competences. The committee of the National Research Council in "Front Matter" (2012) mentioned earlier comes to the conclusion that 21st-century skills are "...dimensions of human competence that have been valuable for many centuries, rather than skills that are suddenly new, unique, and valuable today" (p. 20). They point out two differences between the past and the present competences: the one lies in high levels of mastery of special skills and knowledge, the other is attributed to the "pervasive spread of digital technologies to communicate and share information." It is stressed that although the underlying communication and information-processing competences have not changed much, they are spread at an increasing pace and used in different life context both in public and private spheres with special emphasis on social networks (p. 21). With reference to recent press reports the 16-21 year-olds spend 3.4 hours daily on the internet, and 93% of them have a Facebook account (Szabó, 2017). Pashi Sahlberg, a leading Finnish education-policy expert blamed the excessive use of the internet for Finland's slipping performance in the PISA tests. The experience of "reading for pleasure" that used to be exemplary for children has decreased while the number of smartphones among school-aged pupils has increased tremendously. According to Sahlberg, most teenagers in Finland spend more than 4 hours a day on the internet, and as a result there is an increased amount of "screen time" to the detriment of "study time" or "reading time". He added that a numerous amount of research investigating the effect of the internet on the brain outlines three principal consequences: shallower information processing, increased distractibility, and altered self-control mechanisms (Heim, 2016).

In 2015 BBC News quoted a global study from the OECD when the evaluation of PISA results came into highlight: “Investigating heavily in school computers and classroom technology does not improve pupils’ performance” and consulted OECD education director Andreas Schleider, who summed up his standing on the topic by saying that “Making sure all children have a good grasp of reading and maths is a more effective way to close the gap than an "access to hi-tech devices”.

It results from the above that we have done something wrong. We made a priority to IT devices, we have spent a lot on technology, installed multimedia in every space, and now we are facing the situation that we do not know, we cannot decide what went wrong when we prioritized the virtual world instead of the real one. Incidentally, media teaching skills are still not a mandatory part of teacher training in all parts of the country. It seems to be obvious that the information superhighway alone is not a remedy for poor education achievement on PISA tests. Not by itself. But it can be part of an answer. Marc Prensky, a writer well-known for his ideas about digital learning, says that when people talk about technology, they are often referring to the ‘nouns’ of technology: apps, devices, digital tools, email. In other words, the specific pieces of software and hardware we hear about, and which are constantly changing. He argues that it is more important that we focus on the ‘verbs’ of technology. These include *”thinking critically, presenting logically, communicating, making decisions, being rigorous, understanding content and context, and persuading”* (Prensky, 2016,) Although the nouns have changed, the verbs have remained the same. In the end, digital education may not completely replace educational activities that take place in real life, but educators with technology-based institutions may find that virtual worlds enable them to move away from 19th- century rote learning. Thus the question is not whether we are on the information superhighway, rather, to question whether it is the right direction.

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