The impact of digitalisation and especially social media on learning, teaching and working processes

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Abstract: This study examines the impact of social media on teaching and learning and on the world of work. By way of introduction, the authors will summarise the characteristics of digitalisation, the nature of the internet and social media in particular, and finally we will discuss the phenomena that have emerged in the information society and that are having an increasing impact on the world of learning and work. These include being always online, the visual turn, multitasking in two senses, a shortened attention span, the fear of missing out, the transformation of human memory use, the strengthening of creative processes, the experience of flow, rapid orientation, greater autonomy or even the ability to live with mistakes. These processes are leading to the emergence of the concept of creative disruption of technology, which is now being understood beyond the economy and into education.

Keywords: social media, world of work, education, ICT

1. Introduction

The changes brought about by digitalisation and the Internet since the 1990s are as follows: global online presence has spread, and social processes have moved to the Internet. Private, public, business, political, cultural, religious, and even leisure spaces have merged (Csepeli and Prazsák, 2013). According to Réka Racsko, the digital transition is the process of the completion of ICT literacy through the application of human performance support technology tools, through the diffusion and integration of information society technologies (ICT tools). (Racsko, 2017, p. 39). Digitalisation has brought computers and smart devices to the internet; interactive, multimedia and innovative content dominates consumption; and screens are permanently embedded in individuals' lives. The speed of information acquisition has accelerated and the need to be always online has become a necessity (Kővári, 2022). In this environment, the nature of knowledge has undergone radical changes: it has become practical,

instantly applicable, multimedia and transdisciplinary (Szűts, 2020). All these phenomena have had a major impact on the world of work. The authors want to present them in this paper.

2. The nature of social media

Since the late 2000s, social media has been the umbrella segment of social networking sites, image and video sharing platforms, blogs and vlogs, wikis and other free and easy-to-write interfaces that have come under the cloak of Web 2.0. According to Tibor Koltay (2010), Web 2.0 platforms are simple to use, driven by user communication and content creation; they support both the roles of consumer and producer, reader and writer at the same time.

Let us start with the group that has had the greatest impact on the world of education and work: social networking sites. In a simplified definition, social networking sites are networks and freely writable platforms for self-expression and the creation of virtual identities, where individuals can create connections and, from these, communities with previously known or unknown individuals. Communities created by strangers may be based on shared interests, work-related problems or cooperation, geographical exposure, etc. Social media avoids the content production mechanisms of traditional mass communication systems and bypasses gatekeepers and editors (Szűts, 2018). In this ecosystem, blogs, social media posts or even free encyclopaedias become the primary and rapid, but unmonitored source of information acquisition. This environment is increasingly controlled by algorithms whose task is to exercise economic or political control.

In the complex world of the 2020's, the phenomena of digitalisation, infocommunication networks, the information society and the fourth industrial revolution are now inseparable (Pajtókné 2007, 2010, 2011). Digital technology and the amplifying effect of continuous innovation that it has brought have transformed educational practices and the way individuals interact with each other in the world of work (Kővári, 2018) (Molnár, 2022). Looking at the evolution of the competences expected by the labour market, while in 2015 critical thinking was followed by collaborative skills as the most important competence, in 2020 critical thinking and creativity were the most important competences (Desjardins, 2018), and by 2025 analytical thinking and innovation were the most important for job seekers, and the ability to apply active learning and learning strategies if they are to succeed in the job market, the expectation to use and follow technology, and the competence to design and algorithmic thinking in program technology (Kővári, 2020) are among the top 10 competences (Whiting, 2020). Conscious use of technology that considers both the goals and the nature of the technology can lead to a

significant increase in the efficiency of both work and education, while the opposite can lead to a drastic decrease in efficiency.

As the price of IT tools has steadily fallen, connectivity has been liberalised and has become an option for everyone, with everyday users, individuals from all walks of life, easily able to connect to the internet, engage in activities according to their own interests and create their own content (Benedek-Molnár, 2019). They can then use the routines they have acquired both for learning and for work. Since the 1980s, when home computers and then personal computers became commonplace, the way in which individuals relate to machines has changed radically. Computers have moved from being servers to being people's collaborators and partners. Nowadays, the dramatic reduction in the cost of producing robots is causing a further change, complemented by the potential of artificial intelligence, opening up new horizons in the world of work and leading to the emergence of cyber-physical spaces, blurring the boundaries between hardware and software, with machines no longer just working with humans but also communicating with each other (Lengyelné, 2022).

3. The consequences of creative disruption

There have been tangible changes in the labour market. The digital nomads appeared, in the online space, who could work without being tied to a specific location. They could telework from anywhere in the world, at any time, using info-communication tools, while they could also train themselves and engage in non-formal learning (Szűts, 2022).

The term 'creative disruptive' is used to describe the increased information flows and data processing potential of ICT, digital and interactive content, networks and social media, and society's overwhelming reliance on digital technology (Tidd, 2019). Creative disruption is leading to the emergence of methods, solutions and practices that redefine previous traditions in the subsystems of economy, society, culture, work and education. Digital content storing, for example, has given rise to interactive media content, unrestricted photography and e-books, compression has led to online file sharing, radically transforming the traditional music market, and teleworking has evolved significantly, with text, image and video files available online anytime, anywhere. In two decades, disruptive technology has made Amazon's online store the world's largest bookseller, and the price of e-books has surpassed that of print books. For the mind socialised in the Gutenberg galaxy, a printed book has a greater value than an e-book, but this value is more sentimental than material. The higher price of e-books is dictated by the logic

of the information society. The knowledge contained in them can be instantly accessed, acquired and applied in the world of work through online purchases. The world's largest organised video collection is Netflix, which offers educational content as well as leisure, while music and audiobook listening is increasingly done in the cloud on iTunes or Spotify, with constant internet access. The podcasting system has brought a change in radio broadcasting, with professional, social or specifically work-related content available anywhere, anytime, on any platform, even on the infotainment system of a car. All the practices presented here are based on a reinterpretation of tradition (Szűts, 2022). What they have in common is the possibility of accelerated and instantaneous access, a wealth of content that is no longer transparent without algorithms replacing the modest offer, and a highly effective and extensive online system of recommendation based on community members (Szűts, 2020). The creatively disruptive nature of technology means that new ICT and digital media can have a profoundly positive or negative impact on learners' attention, cooperation or motivation (Molnár, 2019a).

In the subsystem of education, creative disruption has brought about the amplification of some earlier practices, while others have been muted and relegated to the background. Classroom interaction, group work and experiential learning were already present in education, but digital technology has provided tools, applications, platforms and content formats for the teaching and learning process. This transformation is described by the SAMR model, according to which technology expands or transforms the world of education. Expansion means replacement and extension, while transformation means modification and reinterpretation. In the case of replacement, the pages of the book are replaced by the screen, and the interface of the blackboard by the interactive whiteboard. Extension is the next step up, since on a screen, unlike a printed book, the explanation of a function can be viewed as a video, and on an interactive whiteboard, animations can be viewed. Conversion represents the stage where, in the case of modification, the screen in the hand - the smartphone - can act as a responsive system, a tool for collaboration, while in the case of reinterpretation, content production is now also possible using smart devices (Molnár, 2019b). The model is well suited to the world of work, where screen-based work replaces paper, augmentation supports processes using digital tools by providing different assistants, modification allows collaborators to work together in the cloud with different privileges, ensuring that all participants see the same document regardless of location, and finally, reinterpretation can also mean, where appropriate, the inclusion of the wisdom of crowds in the work process in the form of crowdsourcing (Szűts, 2022).

Creative disruption has also brought opposites to the surface. Such as the difference between pedagogical and social media communication practices in education. During leisure time on Facebook or Instagram, the time for feedback is reduced to minutes or even seconds. Reality dominates. School communication practices, despite the importance of timely feedback, are a galaxy slower. Communication in the world of work, together with its support for rapid information exchange, has also created a kind of pressure to work continuously, which means an increased stress load, which is why more and more companies are choosing to shut down their mail servers after working hours. Another consequence of the disruptive nature of technology is that children are interacting with digital, multimedia content and smart devices as independent users from the age of 2-3. Their exploratory curiosity leads them to discover more and more new technology, but they do not acquire systematic knowledge. During this period, they become so accustomed to the level of experience provided by smart devices and digital content that it becomes increasingly difficult to keep their attention in school using the tools and methods of the Gutenberg Galaxy. In contrast, however, the basics of traditional literacy, reading and writing, are not acquired in a systematic way until the age of 6, when they start school. The systematic acquisition of information literacy in school, starting at the age of 10, is still slow and takes place in the context of digital literacy. The digital environment is not just an opportunity to extend interactions, but interactivity is a natural practice, one-way communication is seen as a norm violation in the digital environment. And this logic also applies outside the world of media, which can easily lead to a conflict of socialization media. (Székely, 2017, p. 201).

4. The impact of digitalisation and social media on education and work

With the advent of web 2.0 in the late 2000s, the hunger for information began to grow. A vicious cycle has emerged, as the information overload in our world forces individuals to consume more and more information, as most of them do not have adequate defence mechanisms. The traditional structures for gathering, processing and transmitting information and knowledge have thus begun to break down. The hierarchy of the institutions that sustained high culture (schools, universities, research institutes, academies) has collapsed and we do not yet know exactly what structures will replace them, as the changes are only now beginning to take shape, but the impact of rapid but uncontrolled sources (free encyclopaedias, blogs, influencers) has increased. ICT can enable anyone to become a content creator, where appropriate, niche knowledge can appear more quickly than in the editorial world, in a

community-generated content environment. One example of a transition between these two paradigms - free editing and controlled content - is the open curriculum system, which is based on micro-content - the creation of complex learning units in open and online curricular structures through the publication of mathematics, images and text, a process characterised by the constructive participation of those actively involved in learning, supported by cloud-based, free-to-write platforms.

In the printed world, learning materials are published at the discretion of editors, whereas in the free-to-write online publishing environment, the issue of authenticity is a major challenge. There is a valid criticism that the big technology companies (Facebook, Amazon, Netflix, Google - FANG) firstly control the information that individuals have access to with their algorithms and secondly, they thematise this space. In practice, this means that the more individuals rely on the decisions of algorithms, the less they will have their own preferred sources of information to turn to and the more they will lose their curiosity to explore. Thus, it is the algorithms that determine which educational content is offered and which is not. Education systems therefore have a major responsibility to develop digitally literate, aware learners (users) who can develop their own knowledge acquisition and use their own skills and will be able to develop their strategy in the online space and understand how algorithms work (Szűts, 2020).

Let's now look at the main features of digital culture content. These are interactivity, hypertextuality, and hypermedia (the combination of text, image, sound and video in a new format). This new type of content expects interactivity from the individual, while offering personalised content with the support of algorithms. Online systems are not pleased with a passive user attitude. They require a new type of attention and psychological aspects are increasingly important in the reception of digital content. Attention will become the universal value used by users, companies and educational institutions in their interactions. Let us therefore highlight Yuval Noah Harari's claim that the US FANG and the Chinese BAT (Baidu, Alibaba, Tencent) are not only building digital content and infocommunication platforms, but that many of these giant companies have adopted the business model of the so-called 'attention wholesalers'. They use free information, services and entertainment to attract and capture our attention (Harari, 2018). This attention is being sold to advertisers in the present, but also to online education platform operators in the future, bringing attention trading into the learning process and the world of work.

The burden on individuals to be aware of the innumerable digital channels through which messages can be transmitted is considerable. For example, by expanding the classroom space, communication processes leave the built environment. The complexity of communication across channels and media, linked to teaching and learning processes, makes the flow of information more efficient when used consciously. Due to the nature of the information age, individuals seek to acquire knowledge on an ever broader horizon but are no longer able to navigate safely through the information presented online, following strategies learned in a print textbook environment.

The changes have brought visuality to the fore. Images, videos and memes are the first to capture the attention of individuals. Competition for attention has also started between users. In the world of algorithms, only what users like and share is successful and spreads, so content creation has shifted from authenticity to interest. The effect of the shortening of the attention focus is that brevity dominates social media. When individuals' attention spans are so narrow, content that is emotive and deals with a topic in an emotive way becomes popular.

Managing time is a constant stress for people in the information society. The consequence of being constantly online is real-time - simultaneity. Simultaneity in the learning process means that learners, while using computers and smartphones, are not only learning the material, but also paying attention to the non-study-related messages that are constantly coming in. Education must therefore become more experiential, encouraging greater engagement to capture the attention of learners.

In practice, learners today are so used to the stimuli from apps and social media on their smartphones that they find it difficult to concentrate in a traditional classroom with a different pace. Users are now being significantly impacted by algorithms that encourage fast scrolling and rapid scrolling. All of these factors can be at the expense of attention and the ability to absorb and retain knowledge, while at the same time reducing efficiency at work. Attention is not only valuable in itself, but also serves as a vehicle to deeper levels of learning, which allow a deeper understanding of the information received. However, without the ability to pay attention to a problem or phenomenon, it also becomes difficult to process information. As a consequence, individuals become less able to interpret, analyse, synthesise and critically approach information (Mancall-Bitel, 2019). Part of the problem is that individuals in the information society are simultaneously engaged in multiple activities and communication processes in their daily practice, and technology dictates the pace at which they live their lives. Their changed routines include avoiding linearity and preferring structures based on

associations, navigation through links, and continuous travel. According to generalised surveys, in 2014, individuals' total attention lasted only 8 seconds, compared to 12 seconds in 2000 (Bershidsky, 2020). In addition to shortening attention spans, thinking in pictures also plays an important role. Process becomes more important than content, while rapid information acquisition is coupled with superficial processing. The consequence of realism is that after each piece of information, the desire for new information is increased, leading to the relegation of past and future moments to the background. (Estefán, 2015). In the information society, under the influence of social media, individuals develop, acquire and fix in their memory a new logic of data acquisition and search strategies. The consequence is a change in which the role of short-term memory - or working memory - is coming to the fore and the role of long-term memory is being reduced (no longer need to memorise a lot of data), and memory as a cognitive ability becomes less relevant. When designing learning objectives, teachers need to be aware of these changes when integrating ICT tools and digital content into the teaching process.

Non-formal learning includes navigation, which takes place in a natural learning environment. In the information society, there is no longer any need to memorise maps, as social, online navigation systems offer drivers the fastest routes in real time based on pre-loaded maps and traffic. So when driving, the human mind has to remember far fewer details about locations, and when it comes to dangerous junctions and road sections that it can't remember, the mind warns itself. These locations are stored in long-term memory through repeated stimuli during driving, and are then returned to working memory when a location is recognised during navigation, so that the driver can react appropriately to an emergency. However, in most cases, the use of long-term memory is no longer necessary; the individual no longer needs to remember a map and can thus use attentional focus to focus more on driving itself (Szűts, 2022). However, what can be considered a useful change when using working memory during navigation is not always effective when learning or working. Indeed, as creativity increases, so does the acquisition and inculcation of knowledge, which the mind must combine. Without concrete knowledge (dates, names, laws, rules, procedures, etc.), successful ideas are doubtful. The result of work done without concrete data will often be poor.

Gergely Nádori - Tibor Prievara, authors of the Teacher Blog, which generates active digital pedagogical discourse, in their 2018 book, Pedagogy in the 21st Century, which takes a practical approach, draw on their own teaching experiences when they write that multitasking "is actually a lot of extremely rapid switching between tasks competing for our cognitive capacity." It is up to the individual to decide which task he or she will allow to draw on his or

her brain resources at any given moment (Katona, 2015). Practising teachers describe this as their impression by the five or six pages, chat window, school assignment, dictionary, etc. that students open on their computers, and the speed at which they seem to move between them with ease and efficiency. Their question is, however, whether this rapid switching between tasks is useful for the students, whether it makes the learning process more efficient and whether the quality of the completion of each task is not compromised (Nádori - Prievara, 2018).

The impact of digitalisation and social media means that individuals' attention is no longer focused on a single task - a discrete, well-defined problem - but fragmented. In this way, the focus of attention becomes shorter, but it is possible to absorb information on a broader scale. This favours work where attention to detail is not required, but rather to the whole picture. The acceleration of the information-gathering process also fosters a sense of impatience, rather than in-depth research into the facts, stories and principles behind phenomena.

5. The world of work and education

More and more methods are appearing in the educational processes with the above effects brought to life. Pedagogical methods such as project- and inquiry-based, adaptive learning, building a personal learning environment, and incorporating communication, creativity, perseverance and collaboration to the highest possible degree are coming to the fore in technology-enhanced educational environments (Racsko, 2016). And among the educational methods, we are increasingly seeing complex development methods that enhance creativity and are heavily based on the use of technology. One excellent example is digital storytelling, which is nowadays a widespread form of public education as well as non-formal education methods. An even more complex solution can be seen in the educational activities of makerspace labs, a movement that started at the turn of the millennium in Europe with hacker groups, whose original aim was the social dissemination of technology. In addition to creativity, makerspace labs develop cognitive and collaborative skills. In the US and Europe, you can find labs operating as stand-alone centres, but since 2010, following the creation of the Fayetteville Free Library in New York State, many libraries have set up digital makerspaces and are developing the skills of their residents by operating as makerspace centres. They are transforming technology into a tool for creation - while teaching how to use the tool, of course - such as:

- Virtual reality (VR)

- Augmented reality (AR)

- 3D printer

- Robots (e.g. Lego robots, Abacusan - ArTec robots),

- Smart home tools

- Laser cutting and engraving equipment

- Embroidery and sewing machines

- Micro: bit and Arduino microelectronics development kits

- Wearable electronics modules, bio-feedback sensors

- Sound and video lab

- Use of drones, etc.

The focus is not on the use of tools, but on the realisation of projects for sustainable environments, cities of the future, or even flying robots.

The operation of makerspace centres directly prepares members of society for the world of work, and more and more elements are seeping into the curricula and working methods of public education.

6. Summary

In our theoretical study, the authors set out to examine the impact of social media on teaching and learning and on the world of work. Our experience since the rise of social media has shown that being online, visuality, multitasking, and a declining attentional focus require adaptation from actors in the worlds of education and work. But this adaptation also implies a new way of looking at things, in which participants can no longer be afraid to make mistakes, but must strive to develop creative processes and to acquire a broader horizon of knowledge, as well as in-depth knowledge and the ability to make connections based on it. At the same time, they must be mindful of the fact that technology wants to dictate the pace of education and work processes, but the appropriate response to this may be for individuals to take control of technology, which can be achieved by always using it in a conscious way, according to its purpose.

Acknowledgments

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