

NOTES ON POST-PANDEMIC EDUCATION

Nevena Ivanova

The COVID-19 pandemic has resulted in school shutdowns all across the world. Globally, over 1.2 billion children in 186 countries have been affected by school closures. As a result, education has changed dramatically, with the distinctive rise of e-learning, whereby teaching is undertaken remotely and on digital platforms. In late March, UNESCO and partners launched the Global Educational Coalition to develop solutions to make digital learning more inclusive and provide support to teachers around the world who were struggling to transfer the content of their teaching into distance forms of education. Most countries, including Bulgaria, recognize the need to implement digital and distance forms of education more systematically in order to be prepared for future necessities like the current pandemic.

However, the impact of digital technologies on education run way deeper than just as tools for distance learning in times of emergency. During the past decades, persistent evidence has been accumulating on the way in which human cognitive processes such as learning and communication have been influenced by the ubiquitous use of ICT. As a response, various stakeholders such as governments, IT companies, educational institutions and NGOs are beginning to collaborate their efforts into devising new systems of education. They are recognizing an urgent need for profound transformation of both the content and forms of education according to the demands of the twenty-first century's technological innovations. As it is becoming obvious now, current technology is unprecedented in its accelerated pace of development as well as in its degree of automation of human cognitive abilities. The most recent studies on the impact of ICT on education (Haddad 2007, Sharpe and Beetham 2007, Tyner 2009, Spector et al. 2010, Sharpe et al. 2010, Davidson and Goldberg 2010, Athreya and Mouza 2017, etc.) address the profound crisis of current education systems around the world and emphasize the necessity to consider their digitalization in the context of broader societal issues. However, digital technologies cannot be considered simply as a tool to be implemented into the existing education system and that is best demonstrated by the failures of most countries around the world to implement ad hock distance learning on a mass scale. Instead, its implementation must be guided by in-depth reflection on the concept of education itself. "No technology can fix a bad educational philosophy" (Haddad 2007). Our current education system, built on the Industrial Revolution model, focuses on memorization and standardization – skills that will be efficiently automated in the near future (in the form of artificial and augmented intelligence). Founded at a time when industries needed workers with a relatively fixed set of skills and knowledge, the existing education system is losing its relevance in an era of innovation, disruption and constant change, where adaptability and learning agility are most needed.

The twenty-first century invites us to restructure our thinking skills and learning practices. Novel tools have created new ways of learning, socializing, and communicating that are dramatically different from those of previous generations. Most human knowledge accumulated over several millennia is becoming accessible on the Internet at the click of a mouse. Even more information is amassing every day, produced by billions of users. With such an information overload the least a teacher needs to do is to provide more information to their students. There is a great need, instead, for young generations to learn how to organize and process the vast amount of available information, think critically, and turn information

into practical knowledge. There is also an urgent need to help young people consider the advantages, constraints, biases and risks of electronic media.

Researchers also emphasize the switch of roles between teachers and students in the context of digital media. The traditional top-down pedagogical practices have become obsolete and ineffective. Instead, teachers should encourage their students into critical thinking, imaginative creativity and collaborative skills through direct engagement with real-life problems. The teaching process must become driven by the students, individually tailored to their interests and talents, and structured around transdisciplinary collaborative projects with practical orientation. Researchers keep pointing out that effective teaching should shift “from direct teacher instruction to interactive exchange with and among students”, “from teaching facts and principles to investigative questions and problematizing”, and “from working with fixed or set curriculum to working on authentic real-life projects.” (Kivunja 2014, 41) The interactive examination process allowed by digital technologies invites for a reorientation from competitive individualistic learning to collaborative learning.

In terms of location and time there are profound shifts due to the specifics of digital technologies. The curriculum moves away from time-slotted schedules simultaneous for all students and switch to completion of tasks on demand individually or collaboratively in small teams. The teaching material is moved away from the classroom-tied contexts to location-flexible global learning networks and from textbook-based fixed data to dynamic web-based sources. The classroom becomes a dynamic place, which can be distributed among multiple physical locations, where learning is mobile, desynchronized and performed via virtual channels.

The emergent new learning paradigm recognises four sets of skills indispensable for the twenty-first century: critical thinking, communication, collaboration, and creativity – what is known as the four “Cs”(Kivunja 2014). This essay will elaborate a few thoughts related to critical thinking.

Historically, critical thinking pertains to a process of distinguishing valuable information from irrelevant information, the ability to identify misconceptions in our own reasoning and those of others, and the ability to discern arguments based on beliefs, emotions or prejudice from reason-based arguments. In philosophy the term critical thinking has been used to describe regulatory mechanisms for achieving mastery in logical reasoning. Simply put, “critical thinking is reasonable, reflective thinking that is focused on deciding what to believe or do” (Ennis 1987, p. 180).

In an epoch of “deep fakes” and “fake news”, where the virtual space is getting saturated with manipulated news reports and videos of existing faces speaking words they have never actually pronounced, the ability to evaluate critically the information one receives is the crucial skill to teach the young generation. The critical thinking process requires that what is said be challenged and evaluated for its integrity and authenticity based on what is already known or on available evidence. Teaching of critical thinking skills encourages students to recognize the underlying assumptions of the information and messages they are exposed to so that they can develop a fuller understanding of what is the meaning of these messages, what is their intended purpose and whom they serve to empower. Based on critical evaluation, students will be able to draw inferences and conclusions from the received information by themselves. Teaching should help them to reflect deeply about relationships such as cause and effect. Moreover, it should help them to develop metacognitive reflection, to explore their

own reasoning and to examine whether it is supportable with evidence or not, and whether it can be generally applied or is specific to a particular case. Such self-reflective metacognition teaches students not only how to analyse but also how to evaluate available evidence, arguments given and claims made. This way, they learn to look at the data from various perspectives and then make connections between and among the pieces observed. From the analysis emerges interpretation of the data enabling students to make well informed, data based conclusions.

In times of information overload, algorithmically manipulated data, and automatization of cognitive functions it is essential to explore the deeper impacts technology and media may have on the processes of learning and creating knowledge. In oral cultures all information has been shared directly and stored into the memory of the receiver. With the advent of writing, information became organized and stored outside of the human brain into different types of media. In *Phaedrus* Plato expresses his concerns of the potentially detrimental impact of this externalized form of information storage on human memory and critical reflection. He warns that reading from books might lead to shallow accumulation of information without thorough understanding of its meaning and, thus, to the mere pretence of erudition instead of real knowledge. In fact, the long-term impact of the written word has seemed to be the opposite – it frees the mind from focusing on memorization techniques towards focusing on new and more sophisticated ways of reasoning and organizing the growing amount and complexity of information.

With the invention of the printing press in 1445 by Johannes Gutenberg the proliferation of books became automated. This automation turned books from expensive and exclusive objects into widely accessible mass commodities. As a result, the demand for information and knowledge increased and reading and writing became widespread skills. Texts of various quality, authorship, addressees and content proliferated and it became difficult to control their circulation. Such democratization of knowledge raised new concerns about the value, authority and truth of the written word. However, soon after the invention of printing media the production of printed material became centralised and regulated by governing agencies. The distribution of information was unidirectional – from publishing agencies (newspapers, magazines, journals and book publishers) to the mass audiences.

ICT and the Internet in particular introduced decentralised forms of authorship where everyone can produce and distribute information or offer their interpretation of circulating ideas. This leads to some obvious concerns. The first is regarding the massive amounts of fragmented, highly dynamic and increasingly complex data which needs to be processed into meaningful information. That information, on its part, needs to be further structured into patterns and models, which would reveal underlying causal relations and systemic interdependencies of the various data flows. The second concern regards the reliability of the various sources of information. The old ways of judging do not always work anymore. The authority of centralised media or academic publishing are overshadowed by the sheer amount of other sources of (mis)information which urges us to find new ways to make distinction between truth and untruth, to learn how to find valuable information and how to avoid the irrelevant gibbering.

In addition to the above concerns, there are a number of speculative theories, which offer a different perspective on the impact of digital technologies on learning and knowledge. Some of the most thought-provoking among them are related to ideas of distributed knowledge. For example, researchers associated with the theory of connectivism has argued that knowledge in

the contemporary Internet era is a process emerging between individual “nodes” in a network, not a representation in the mind of individuals (Siemens 2005). The emphasis shifts from knowledge as an object to knowing as a process. Knowing facilitated by new technologies is dynamic and fluid as the nodes are constantly changing, joining and leaving the network, forming various connections. Knowledge is an emergent property of the system, existing beyond the individual. “Learning (defined as actionable knowledge) can reside outside of ourselves (within an organization or a database)” (Siemens 2005: 1). Connected knowing is not controlled by formal institutions, it is distributed across network of connections and these networks are themselves inter-connected with innumerable other networks (Downes 2006).

There are also researchers as diverse as Douglas Hofstadter, Pierre Lévy, Henry Jenkins, Francis Paul Heylighen, and Louis Rosenberg (to mention but a few) who support in some way the idea of collective intelligence. Philosopher Pierre Lévy defines collective intelligence as “a form of universally distributed intelligence, constantly enhanced, coordinated in real time, and resulting in the effective mobilization of skills.” (1999:14) The notion of collective intelligence emphasises a shift of knowledge and power from the individual to the collective. Forms of collective intelligence has been manifested in the working of Google, the creation of Wikipedia and other open source initiatives and participatory culture. Some authors, influenced by cybernetics, recognize the role of algorithmic systems in the formation of collective intelligence.

The tendencies observed above towards decentralisation and democratisation of knowledge makes it even more pressing that all individuals participating in different groups and networks are taught from an early age how to develop their critical thinking skills and metacognitive abilities for self-reflection.

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