Insights into the Digital Transformation of the Educational System in the Context of Covid-19 Crisis

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Abstract

The purpose of this article is to offer an insight into the new learning layout facilitated by digital transformation in schools in the context of the coronavirus crisis (Covid-19). The digital transformation of schools is a complex process that involves a significant number of stakeholders that will provide new, unexpected learning experiences to students over a period of time that may stretch for years and generations. The Covid-19 crisis had a huge impact on the education industry since it has fostered the development of digital competences of teachers and students, together with the institutions managers. However, there are raising concerns about how effectively the Covid-19 crisis has accelerated the digital transformation of schools and to what extent it has determined people to adopt technology as a trustworthy long term tool for both teaching and learning. Based on survey conducted in a secondary school, this paper presents some of the factors that may influence the development of technology in educational environments. Also, this article highlights the many ways in which schools can benefit from the digital transformation, as well as the risks and challenges that one may encounter in using technology for educational purposes. Another aspect that has been considered was the stakeholders readiness to learn, change and innovate as well as their access to state-of-the-art equipments, learning platforms, databases, augmented reality, new educational applications, and even the Internet of Things (IoT). Finally, planning and implementing a digital strategy is a burning issue that should be dealt with by a modern management that is willing to facilitate and implement innovative teaching, training and modern evaluation tools in an age where time is a key resource.

Keywords: Digital competences, digital transformation, educational system, coronavirus crisis, learning experience.

JEL classification: M15, I2.

1. Introduction

The crisis caused by the pandemic due to the Sars Cov-2 virus was a crucial moment for the evolution of the educational system that had to be reinvented and use all available digital tools to ensure the continuity of the act of teaching-learning online. Due to the health crisis almost half of the world's students are still affected by partial or full school closures and prioritizing education recovery in this situation is crucial (UNESCO, 2021). It is obvious that any crisis favors the appearance and manifestation of dysfunctions with major impact both for the organizations and for the entire social environment in which they operate. However, any crisis triggers a change that can become positive, as it forces people to step out of their comfort zone and rediscover, explore human resources and material at a different level, from a different perspective.

For ancient physicians, the Greek word "krisis" refers to the point where the disease undergoes a decisive change, for better or worse. Thus, the notion of crisis has various and sometimes contradictory definitions with a focus either on the severity of the crisis situation or on the its unpredictable, sudden and exceptional character that can generate positive,

revolutionary changes in the long run (Cunningham, 2020). The outbreak of Covid-19 brought on a severe crisis in all educational systems from preschool to higher education because of the emergency situation which required schools to shit to online and distance learning without any notice or preparation in advance. Kindergartens, schools, universities, campuses and other sites were closed on a very short notice in order to avoid the spread of the virus and its deadly effects. The idea of online learning was still new to some of the schools and many teachers and students were left with a deep feeling of disorientation and frustration for not being able to ensure learning as usual. Still this new situation revealed a wide array of technologies (apps, platforms, software) to improve and extend education and training. The COVID-19 crisis, which has heavily impacted education and training, has accelerated the change and provided a learning experience. In this new learning context, digital transformation of schools all over the world has become a priority that includes major changes at all levels: personal, social and economic. Driven by innovation and technological evolution, the digital transformation is reshaping society, the labor market and the future of work (European Commission, 2021).

Education is moving into the online world in a rapidly changing society. This increase has also been accelerated by Covid-19 pandemic and lockdown situation which forced worldwide institutions to go online for more than a year. This transformation was perceived as a natural or abrupt one depending on the digital background and experience of each school institution and was marked by either breakthroughs or digital exclusion in the field of education.

2. Literature Review

According to Oxford Advanced Learner's Dictionary *digitalization* represents the process of changing data into a digital form that can be easily read and processed by a computer which shall not be confused with *digitization*, a slightly different and simpler process (Oxford Dictionary, 2021). Bloomberg (2021) explained that digitalization refers to the ways in which social life revolves around digital communication and media infrastructure whereas digitization consists in the process of simply moving from analogue to digital form. He gives the example of converting handwritten or typed text into digital form or converting the music from a VHS tape to digital format.

According to Siebel (2019) the digital transformation arises from the intersection of cloud computing, big data, IoT and AI (artificial intelligence) and it is vital in all fields of activity, including education. There are two waves that contribute to the digital transformation of the society: digitalization and the Internet. By using digital technologies organizations and governments work more effectively and efficiently because they replace human hours with computing seconds and dramatically streamlined the user experience across many industries.

The benefits of digital transformation will be seen everywhere, improving the lifestyle of people worldwide by boosting economic growth, promoting inclusiveness, improving the environment and extend the length and quality of human life (Siebel 2019). The scale of change will be gigantic in all industries and only those who can come up with new ideas and create a new era after disruption will survive and thrive. The European Commission (2021) emphasizes how the digital transition may drastically improve life on our planet.

The digital transformation in education has shed light on the enormous potential of using technology for educational purposes by enhancing communication for collaborative and creative learning, and by the use of devices and learning platforms or applications. Including technology in educational systems had already started decades ago and answers the needs of the Z generation, of the digital students who have grown up in a digital world that allows them to better develop themselves. Mark Prensky (2001) identifies two types of **digital users**: the **digital natives** who are described as the *native speakers* of the digital language of computers,

video games and Internet. They spend thousands of hours in front of screens in order to read for school, play video games or socialize. Computer games, email, the Internet, cell phones and instant messaging are integral parts of their lives. On the other hand, **digital immigrants** have adopted, the new technology later on in their life and prefer looking up the information they need in a printed book first while turning to the Internet second. They are the kind of people who would print an email in order to better understand it or to make notes on the printed version instead of editing it on the screen. The single biggest problem facing education today is that the Digital Immigrant instructors, who speak an outdated language (that of the pre-digital age), are struggling to teach a population that speaks an entirely new language (Prensky 2001).

Grand Clement *et al*. (2017) highlight the extent to which digital technology has become increasingly intertwined with every aspect of our daily life: from education to social, political, financial and even health management. Corsham Institute in partnership with RAND Europe Design (Grand-Clement et al., 2017) have explored the challenges of the digital environment and have assessed how digital technology can best support the development of the individuals themselves in order to improve the world as Prensky (2001) would have said. They identified two types of skills: digital skills which correspond to one's technical skills like coding or programming and digital navigation skills which are more complex and include a wider set of skills such as finding information and assessing its quality and reliability. The digital navigation skills were referred as *eternal skills* due to the fact that they comprise past basic skills such as communication and writing, critical thinking, problem solving, teamwork or resilience.

The education learning systems are also part of the digital transformation and must harness its benefits at all levels. Educators themselves will move away from the traditional learning style where the teacher was the source of information and will assume a new role that of a learning mentor who will motivate, encourage and assess the performance of the students. There has also been a role reversal as Grand Clement *et. al.* (2017) point out in the conditions where the young generation is often more familiar with learning tools and devices such as interactive whiteboards, computers, digital video projectors, tablets etc.

The educator plays an important role in the process of the digital transformation and will have to improve their digital skills according to the advances in connectivity; the widespread use of devices and digital applications. The COVID-19 crisis, has heavily impacted education and training, has accelerated the change and provided a different learning experience. Savage and Barnett (2015) analyze the role the digital technologies play in assisting teachers, in the varied aspects of their role from communicating subject knowledge, assessment, feedback, administration and extending learning beyond the classroom and school day. The major challenges for educators who manage the digital change in schools are: developing digital skills, creating communities on online platforms, planning, organizing, creating a digital pedagogy, managing change: educational, technological, social.

The crisis caused by the pandemic due to the Sars Cov-2 virus represented a crucial moment for the evolution of the educational system that had to reinvent itself and ensure the continuity of the act of teaching-learning in an online system.

The Covid crisis was an X-ray of the world educational systems in the 21st century, assessing the quality and inclusive education levels. Unfortunately, many countries experienced shortcomings in the system mainly because of the lack of devices or because of the poor internet connection (Figure 1). Besides the obvious benefits of using technology in schools, some students and teachers found themselves helpless when the entire world switched to online learning because of the lack of digital skills and tools. A great number of learners faced many challenges when moving online like the lack of available devices, resources, skills, training or connectivity which deepened the digital education divide. These barriers to

educational inclusion of all participants led to what Grand Clement *et. al.* (2017) called *digital exclusion* which was reinforced by other types of disadvantages related to parental or family support, mentoring, being part of a community, as well as social and economic status.

Quality and inclusive education should become a priority for building the future society. For this, it is important to embed digital technologies into educational practices in a clear, responsible and effective way. This can be achieved by enabling factors for effective digital education and training: connectivity and suitable digital equipment for learners, an adapted pedagogy; leadership; collaboration and the sharing of good practice and innovative teaching methods. The minimum digital technological architecture required for educational-based units to ensure that digital education is fair, motivating, relevant, inclusive, does not marginalize children from disadvantaged backgrounds or those with disabilities (Romanian Ministry of Education and Research, 2020).
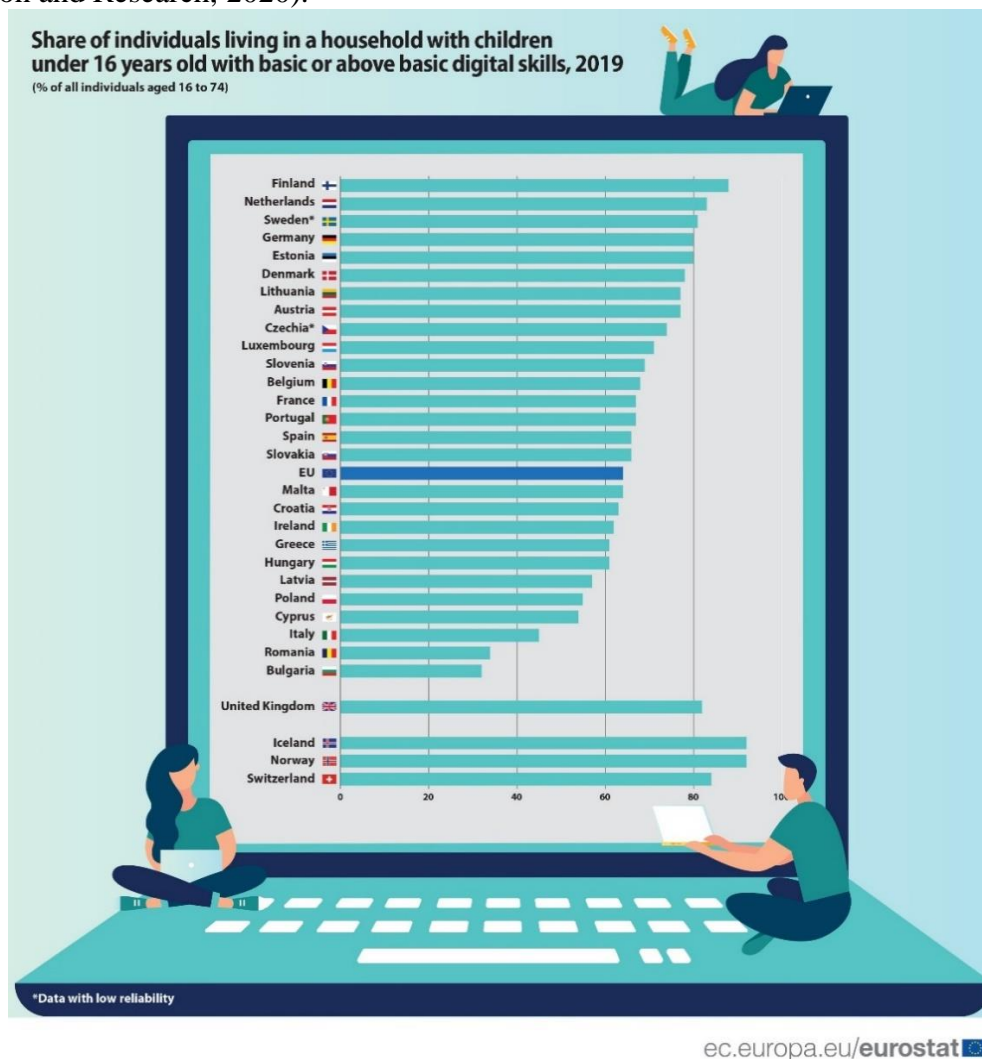
Figure 1. Digital skills of EU citizens living with children
Source (Eurostat, 2021)

The use of technology provides students with better learning opportunities because technology should not get in the way of technology, but on the contrary it should enhance it, keeping up with a rapidly changing society. This could also mean a total change of pedagogical and social paradigm which gives birth to a new type of citizen: the ***digital citizen***.

Ribble (2015) considers that technology has changed the dynamics of families, schools and communities, coming along with many opportunities for personal and educational growth, allowing for a creativity that was not known in the past. The classrooms of students learning and living in a digital age need to be aware of their rights and responsibilities and also understand the importance of character and integrity.

The project of digitalization process in school may be a long and complex one because it requires a significant number of technological changes, pedagogy changes and staff training under the guidance of a digitalization specialist who is not always available to undertake such a challenge. The crisis caused by the spread of the virus Covid-19 mobilized everyone to find a shortcut for this major step forward called Digitalization of Education. Unfortunately, not all the schools could benefit from the experience and proper guidance of digital specialists because of the lack of a national strategy for efficiently implementing the process of digital transformation in schools. In this context many teachers and students were not even aware of their rights and responsibilities, of the hidden risks of e-learning, not to mention that there were cases when the mere communication was not achievable because of the lack of devices or knowledge. The digital transformation in schools was already happening, but the pandemic accelerated it in 2020 bringing to light the potential benefits and risks of using technology in schools, and the lack of a common strategy for adopting the digital tools in the classroom, as can be seen in Figure 2 where the distribution of decision –making responsibilities were mainly attributed to teachers, the state or central institutions providing a higher support for deciding the closure-opening of schools or making available various resources for e-learning.

The state of school education: One year into the COVID pandemic

Figure 7.1 • Distribution of decision-making responsibilities
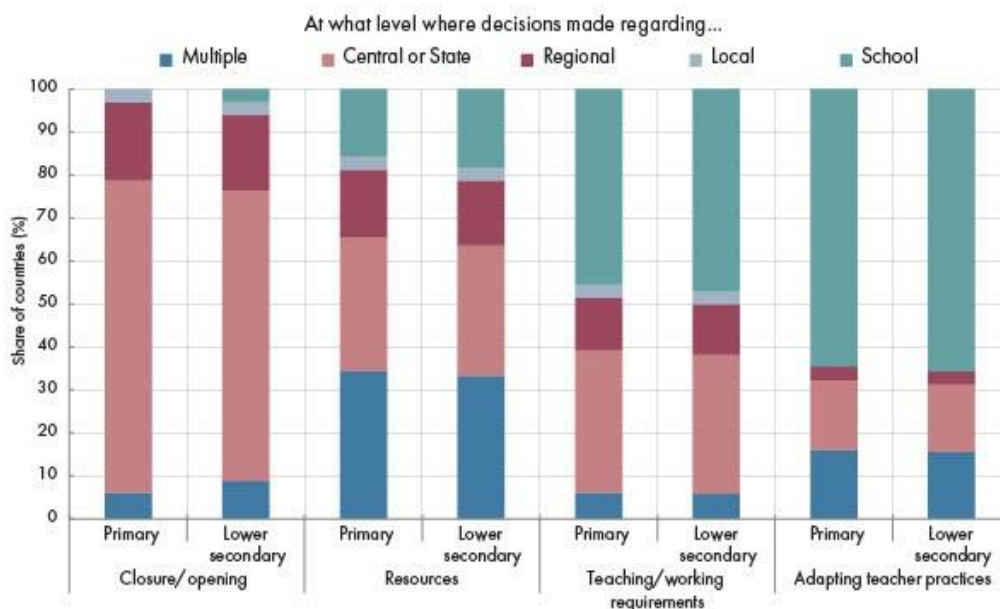
Figure 2 Distribution of decision-making responsibilities
Source: OECD, 2021

In the age of globalization, large communities are being created with the help of digital tools and that is why a sustainable project management strategy is required in every educational institution. The distinctive elements of ***project management*** in the educational system draw on

the project management from any business environment. Haugan (2010) gave the following definition: "project management can be defined as the application of knowledge management skills, skills, tools and techniques to design activities that meet or exceed the needs and expectations of stakeholders. Management functions are planning, organizing, staffing, directing and controlling (and, depending on the school, coordination)".

3. A new social paradigm, a new type of educational management. The case study of Prof. Ion Vișoiu Secondary School from Chitila, Romania

It is obvious that the use of technology in educational management is necessary because it creates improved learning opportunities, accessible, adapted to each learning style, but one must acknowledge how the phenomenon of digitalization generates a total change of pedagogical and social paradigm that will give rise to new type of citizen: the digital citizen.

Managing this transition to a digital age requires awareness of the new rights and responsibilities of the digital citizen, along with managing issues related to this change: GDPR policy, data protection and security, access to immoral content, malware, privacy, integrity and ethics or copyright. According to Ribble (2015), the digital world has changed the way people are and function as citizens of the "real" world because users live, work and interact in a digital, virtual world that transcends known notions of time and space.

Everard et al. (2004) raises the question of the factors that contribute to the success of educational change and highlights that no change has a "toolkit" to guarantee success, but rather, change management requires practical experience, reflection and critical thinking to a conceptualization and analysis of the change process.

The transformation of schools is a complex process that involves a significant number of stakeholders over a period of time that may stretch for years and generations. The Covid-19 crisis had a huge impact on the education industry since it has fostered the development of digital competences of teachers and students, together with the institutions managers. This crisis came along with a series of benefits and risks as well. Among the *benefits* it is worth mentioning the accessibility of time and place, affordability, improved communication and collaboration, detailed planning and feedback, improved teaching and learning experience through the use of technology. The *technical* failures (lack of full technical and administrative support), the financial restrictions (hardware and software purchases), online security (malware, threats, privacy, GDPR policies), integrity and copyright and rightful assessments are amongst the risks

Present paper shows the results of a survey conducted in the Ion Vișoiu Secondary School from Chitila, Romania, with both primary and secondary students (800), teachers and managers (82). Its main aim was to assess the digital strategy and the practice of using technology in school becoming a screenshot of the educational process in the context of Covid-19 crisis.

The report was designed by EDU Networks Romania and was entitled SELFIE (Self-reflection on Effective Learning by Fostering the use of Innovative Educational technologies) being financed by the European Commission who had designed this free tool to help schools embed digital technologies into teaching, learning and assessment. Also, SELFIE was developed in accordance with the European Commission framework on promoting digital-age learning in educational organizations.

Prof. Ion Vișoiu Secondary School demonstrated a moderate ability to adapt and adopt the digital tools for teaching, but teachers became aware of the enormous potential of the digital world and took on training programs. As for students they required more coding and programming classes. The school managers understood how technology can improve communication at all levels and decided to adopt more digital platforms for keeping registers, and giving reports.

The survey conducted among the digital teachers showed a *good level of integration of digital technologies for teaching and learning* and scored 3.6 points out of 5 and, with the following skills being evaluated: progress analysis, use of technology in pedagogy, partnerships and remote teaching and learning.

The survey conducted among the digital students focused on questions that assessed their level of digital literacy, which reached the rate of 3,6/5, including knowledge about: digital behavior and responsibility, trusted sources for information and copyright, creating digital content, learning coding or programming and also technical issues.

The survey conducted among the school managers showed a good level of integration of digital technologies for teaching and learning and scored 3.6 points out of 5, with the following skills being evaluated: the digital strategy, the relationship with the teachers, modern teaching methods, time spent for developing the digital teaching, copyright and licenses.

4. Conclusions

The transformation of schools is a complex process that involves a significant number of stakeholders over a period of time that may stretch for years and generations. The Covid-19 crisis had a huge impact on the education industry since it has fostered the development of digital competences of teachers and students, together with the institutions managers. Still, there is place for improvement and there is also a strong need for developing a pedagogy of digital education in order for teachers and students to find common ground and make proper use of the advances of technology for their own and others benefit.

The most important benefits that come with the digitalization of the educational process are communication and collaboration, easy access to a multitude of information available in digital format, the possibility of adapting teaching content and teaching techniques to the learning needs of digital natives. On one hand, all these advantages can contribute to the development of the educational process and the achievement of superior results compared to traditional education, but there are also certain risks, disadvantages that must be taken into account and carefully monitored. One of the disadvantages is the diminished physical interaction, lack of concentration and in-depth understanding as students become dependent on permanent stimuli, lack of autonomy. This happens because some students develop the habit of relying exclusively on the Internet to access information and solve problems. Moreover, schools and parents are confronted with the impossibility of monitoring and intervention in the case of the phenomenon of cyberbullying or restriction of access to immoral content that may affect the behavior, personality and development of students.

Overall, the crisis caused by Covid-19 meant a change of the paradigm in the educational field facilitating an improved communication and a fast access to information, but at the same time leaving room for problems aimed at the psycho-emotional development of the participants in the educational process. In this sense, there is a need for careful monitoring of changes and results generated by abrupt digitization, in a pandemic context, through careful data collection and collaboration with psycho-educational specialists who can identify optimal solutions for improving school performance and reducing related risks.

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