

Ruzin, Aleksandra Nakeva

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KEY FACTORS FOR EFFECTIVE DIGITAL EDUCATION AND POST-PANDEMIC BLENDED LEARNING

Aleksandra Nakeva Ruzin

Univeristy American College Skopje, R.N. Macedonia

aleksandra.n.ruzin@uacs.edu.mk

ABSTRACT: Education systems are part of the global digital transformation, not only because schools have a significant role to play in developing students' digital competencies and in preparing them for the world driven by technology, but also because technology can influence the way we teach and learn. The prolonged perception of the limited potential for using digital technologies in education was abruptly changed during the COVID-19 pandemic, which put the traditional schooling to a halt. In difficult circumstances, continuity of the educational process was enabled by an unprecedented use of digital technologies, although with significant variations in the effectiveness of practices which impacted the quality and inclusiveness in education. Based on best practices and lessons learned in the process of implementing online and distant learning in the primary and secondary schools in the EU and in North Macedonia from the beginning of the outbreak, this paper elaborates on the key factors for effective digital education. Taking into account the positive effects and benefits of using digital technologies in education, it offers a discussion on the modalities for applying blended learning from the next school year.

KEYWORDS: *Digital education, remote teaching, distance and online learning, blended learning, digital transformation of schools*

INTRODUCTION

The rapid digitalization over the past decade – the so-called Fourth industrial revolution – has transformed many aspects of our social life and labor markets, including the education systems. Schools are part of this digital transformation, not only because they have a significant role to play in developing students' digital competencies and preparing them for the world driven by technology, but also because technology can influence the way teachers teach and students learn.

Hence, the term “digital education” encompasses two different, but complementary perspectives: development of digital competences of students, and pedagogical use of digital technologies for facilitating, advancing and transforming the teaching and learning processes.

Primarily, digital education can play an essential role in enhancing the digital competences of students,¹ bringing along manifold benefits that span across various dimensions. From a labor market perspective, digital education is key to bridging the gap between the supply and demand for a digitally competent workforce (European Commission, 2020b).² Digital technologies and skills are also considered essential for the implementation of the European Green Deal and for achieving climate neutrality of the EU by 2050 (European Commission, 2020a).³ From a social point of view, education

can contribute to reducing digital skills divide that generates social differences between population and leads to economic and social exclusion.

The second dimension of digital education, namely the use of digital technologies in the processes of teaching and learning, has increasingly gained momentum over the past decade. Although empirical evidence on the effects of digital technologies on improving the learning outcomes is still scarce, some potential benefits are more than obvious. Digital technology, when applied skillfully and effectively by teachers, can fully support the agenda for high quality and inclusive education for all students (European Commission, 2020b) and, conditioned on teachers' adequate access to digital devices and tools, proper training and freedom in implementing the curriculum, it can serve as a useful and functional tool in effectively integrating curricula and student assessment (Microsoft, 2018). According to the European Commission (2020a), the use of digital technology can also provide innovative and stimulating learning environments, facilitate individualized and flexible learning, and increase student motivation. It can be a powerful and engaging tool for collaboration and creative learning, and can help students and teachers access, create and share digital content.

Hence the essential role education systems should play in embracing digital technologies in the processes of teaching and learning, while avoiding the risks that may arise from digital exclusion or inappropriate use of technology (European Commission, 2020a).

1 With the Council Recommendation on Key Competences for Lifelong learning (2018/C 189/01), digital competences are recognized as key competences for lifelong learning. Being digitally competent involves the confident, critical and responsible use of, and engagement with digital technologies for learning, working, and participation in society.

2 According to the European Commission, 90% of the jobs in the future will require a certain level of digital skills, however, 35% of Europe's workers lack these skills today (European Commission, 2020b).

3 Commission's Communication on the European Green Deal (COM/2019/640 final) and the new Skills Agenda (COM(2020)441 final/2) recognize the links

between the green and digital transitions and the need to exploit synergies between them.

Digital technologies are seen as basis for the green economic transition, including to a circular economy and de-carbonization of the energy sector, transportation, construction, agriculture and other sectors and industries.

To this end, the first framework for digital education in the EU was introduced in 2018 with the adoption of the Digital Education Action Plan for 2018-2020⁴, and a number of other initiatives have also been undertaken in this domain at a global level. However, they have often been viewed as limited in scope and with a marginal systemic impact, which has been partly a result of the perceived limited potential of the use of digital technologies in education (European Commission, 2020b).

Such a perception was abruptly changed with the COVID-19 outbreak, which has put the traditional schooling to a halt and has profoundly affected the education systems world wide. In difficult circumstances, continuity of the educational process was enabled by an unprecedented use of digital technologies, thereby accelerating the already commenced process of digital transformation in education.

However, there has been a significant variation in the effectiveness of digital education practices, which has impacted the quality and inclusiveness of the overall process. The remote teaching in North Macedonia and in the EU during the pandemic times has uncovered the systemic challenges as well as the key factors that influence the effectiveness of digital education, that governments would need to strongly focus on, not least in applying the blended learning concept in the aftermath of the current health crisis.

DIGITAL EDUCATION IN COVID-19 TIMES

The unforeseen health crises and abrupt closure of schools in March 2020 - as a

measure of containing the spread of the COVID-19 virus - created a sense of urgency in using digital technologies for continuing the educational process.

According to the public consultations conducted in the EU during 2020, this has resulted with the digital learning practices being implemented rapidly, often in an unplanned and unstructured manner (European Commission, 2020a).

Similar experiences were also present in North Macedonia, where the school closure at the beginning of March caught the system completely unprepared, in terms of lacking both policies and practices for remote teaching and learning.

This “premature” implementation of the digital education, both in the EU and at home, resulted in swift learning and adapting to the new circumstances by all stakeholders in the education system, opening up a space for innovations and creativity within the sector. However, it also created a room for suboptimal practices, which resulted from systemic shortcomings that hinder successful integration of digital technologies into education - primarily lack of teachers’ skills in this domain and insufficient digital capacity of institutions at all levels of the education systems.

In terms of teachers’ readiness, despite the EU’s Digital Education Action Plan 2018-2020 - whose aim was to adapt the education systems in the Member States to the digital age - the public consultations, conducted for the purpose of renewing the Action Plan for the period of 2021-2027, show that, before the crisis, almost 60% of the respondents (teachers, students, parents and institutions) had no experience in remote teaching and learning (European Commission, 2020a).

In North Macedonia, the initial findings from a Survey on the experiences of principals, teachers and parents with the

⁴ Even though the first Digital Education Action Plan was well received by Member States and has contributed to initiating policy dialogue in this domain, its short duration (2018-2020) and limited budget, have prevented it from realizing its full potential and having the necessary impact (European Commission, 2020a).

online and distance learning in the second half of 2019/2020 (REACTOR, 2020), indicate heavy inefficiencies in the teaching process.

This prompted the education authorities in the country i.e. Ministry of Education and Science, to swiftly approach designing, developing and implementing a National Platform for Online Learning (National Platform)⁵, which became operational at the beginning of the 2020/2021⁶ school year.

However, it should be noted that the National Platform and the overall remote education process in the country was conceptualized, designed, developed and implemented as a response to, and at a time of the COVID-19 pandemic, which is several years ahead of the time planned for it with the Strategic Plan of the Ministry of Education and Science for 2019-2021.⁷

Such an abrupt and untimely-planned integration of digital technologies into the education system in North Macedonia has revealed many of its structural challenges - not least insufficient or obsolete digital infrastructure; teachers and students lacking digital devices and Internet access, particularly pronounced in disadvantaged families; deficient digital capacity⁸ of schools and teaching staff, etc.

KEY FACTORS INFLUENCING THE EFFECTIVENESS OF DIGITAL EDUCATION

The COVID-19 crisis has clearly demonstrated a number of key factors that influence the effectiveness of digital education, measured by improved learning outcomes and enhanced student experience. Both in the EU and at home, the most recent experiences show that high performing digital education ecosystem depends on effective strategic planning, adequate access to digital infrastructure (including digital devices), digitally skilled teachers, high quality digital content and functional and secure digital platforms.

Effective strategic planning

According to Microsoft (2018), the most successful initiatives for digital transformation in education globally share an identical approach to the realization of this transformation journey, i.e. planning and implementation of effective policy, leadership, and transformation of pedagogy in a holistic, methodical and systematic way.

In the EU, the long-term vision for digital education in the Member States is set with the renewed Digital Education Action Plan 2021-2027⁹ The Action Plan defines priorities and actions for addressing the challenges and opportunities for digital education in the formal, non-formal and informal learning environments, and in lifelong learning. It aims to “contribute to a European society powered by digital solutions... and respond to the lifelong needs of people and organizations”¹⁰, and is also viewed as a tool for

5 More details about the goals of the National Platform, its overall design and plan for implementation can be found in the presentation of the author at the Fourth Internet Government Forum (held virtually, on 15 Dec. 2020). A recording is available at: <https://youtu.be/hnenqh4d2k8?t=2213>.

6 The school year 2020/2021 started with a preplanned delay of 1 month, at October 1, 2020.

7 The Use of ICT in learning processes and Establishment of a unified electronic platform for teaching, learning and methodological resources - as measures set with the Strategic Plan under Priority III. Ensuring widespread use of ICT in education and training and digital literacy - were scheduled for gradual implementation by 2025.

8 Digital capacity refers to the ability to integrate, optimize and transform digital technologies in teaching, learning and assessment.

9 The renewal of the Digital Education Action Plan - as a key initiative to “help unlock the potential of digital technologies for education and to address the widening digital skills gap” - was announced in the European Commission President von der Leyen’s Political Guidelines for the current European Commission 2019-2024 (Von der Leyen, U., 2019).

10 Communication from the Commission to the European Parliament, the Council, the European Economic

achieving the goals of the European Skills Agenda, according to which, 70% of the population aged 16 to 74 should have at least basic digital skills by 2025.¹¹

The Digital Education Action Plan serves as a guidance for the Member States in developing and executing policies in the area of digital education. In most European countries, digital education is regulated with separate strategies, while in some of the countries this topic is addressed with more general strategies that incorporate the aspect of digital education.¹²

In North Macedonia, although some elements of the digital education concept are integrated in the planned National Strategy for ICT 2021–2025¹³, the education authorities have still not enacted a digital education strategy, which, as a comprehensive top-level policy document, would offer a holistic vision for systematic and coherent implementation of digital education in the country.

Although with certain differences that result from national specifics, strategies for digital education, in general, address several key issues such as: acquiring students with digital skills; training the teachers; supporting schools in the application of digital technologies; and equipping them with digital devices and infrastructure.

In addition to enacting digital education strategies, of equal importance is their

regular monitoring and evaluation with an aim to align them with the dynamic technological development and the job market needs for digital skills. Nevertheless, regular digital capacity planning and development is less common in the EU Member States, which is also noted as a weakness by the European Commission (2020a).

Infrastructure, connectivity and digital devices

Although investments in digital infrastructure do not by themselves guarantee progress in digital education or in enhancing students' digital competences, infrastructure is to some extent a prerequisite for applying digital technologies in education. Moreover, the COVID-19 crisis has clearly shown that digital infrastructure is essential for ensuring inclusiveness in education.

Most EU Member States have a strategic commitment to invest in digital infrastructure of schools, and in many of them, these investments are set as one of the goals,¹⁴ or even as the main focus of their digital education strategies (Eurydice Report, 2019).

The 2nd Survey of Schools: ICT in Education assesses progress made in mainstreaming ICT in education and aims to define a model for a highly equipped and connected classroom. There are different approaches to this end, namely some Member States have adopted so called “bring your own digital device” policy -

and Social Committee and the Committee of the Regions on Shaping Europe's digital future. COM(2020) 67 final.

11 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the European Skills Agenda, COM (2020) 441 final/2.

12 In 2019, only six countries in Europe, including North Macedonia, have not had digital education strategies as a separate policy document (Eurydice Report, 2019).

13 The National Strategy for ICT for the period 2021–2025 is planned to be adopted by the Government and enacted by the end of 2021.

14 In Germany, for example, with the Digital School Pact (DigitalPakt Schule) from 2019, the Federation is committed to providing € 5 billion for digital infrastructure in schools (WiFi, new laptops and smart boards, and Internet platforms for collaborative learning), with schools contributing with at least 10% of this amount over a five-year period. Schools are responsible for the provision of learning software and maintenance of the digital infrastructure.

In Ireland, the Digital Schools Strategy sets aside € 210 million for the period 2015–2020 to support school infrastructure investments, of which € 60 million is allocated through school grants.

although with significant variations in its application across the Member States – and several states apply this policy in parallel to public investments in this segment (European Commission, 2019a).¹⁵

With the Digital Education Action Plan 2021–2027, the European Commission also commits to supporting the Member States in provisioning of gigabit internet connection to (and in) schools, and encourages them to utilize utmost of this measure by procuring digital equipment and e-learning platforms (European Commission, 2020b).

In North Macedonia, although there is no separate policy document that would specifically govern investments in digital infrastructure in schools, this segment is regulated with the Strategy for Education 2018–2025 and the Action Plan. Namely, *Priority 3.1. Use of ICT in the learning process* (Pillar 7 of the Action Plan), stipulates that at least 50% of the public schools in the country will be provisioned with necessary ICT equipment within the period 2020–2025. The implementation of this priority to a large extent has been accelerated for the purposes of implementing the National Platform for Online Learning.

Digital competences of teachers

Digital competences of teachers and their ability to use digital technologies in a confident, critical and responsible way is essential not only for their personal and professional development and integration into the digital society, but also for utilizing the potentials of digital technologies for teaching and learning. This is backed by the findings from the 2018 International Computer and Information Literacy Study (European Commission, 2019b), which show that improvements

in digital infrastructure do not systematically lead to integration and pedagogical use of digital technology in schools across the EU. The OECD publication on the opportunities posed by the digital transformation and its risks to human well-being (OECD, 2019a) goes even further in emphasizing the importance of this component, noting that the use of digital resources by teachers who do not possess appropriate digital skills can have a negative impact on students and on the learning outcomes.

Hence, the development of teachers' digital competences is considered a key factor for maximizing investments in digital technologies and aligning schools with the needs of the 21st century.¹⁶

Teachers' specific digital competences refer to all areas of their work, including teaching, assessment, communication and collaboration with students, colleagues and parents, and the creation and sharing of digital content and resources. These competences and teachers' positive attitudes towards digital education are key to the effective pedagogical application of digital technologies, which is essential for facilitating the learning process. They are also called “digital pedagogies” or “digitally-supported teaching methods”, while the technologies used in this context are the means to achieve the defined learning outcomes.

At the EU level, teachers' digital competencies are governed by the European Digital Educators Competence Framework (DigCompEdu), which is a scientifically grounded general reference framework that defines what it means for

15 In Estonia, the strategic measure “Access to Modern Digital Learning Infrastructure” aims to develop digital resources and learning technology that allows all students and teachers to use their own digital devices at schools, along with the school digital infrastructure.

16 In line with this conclusion is a statement by the Federal Ministry of Education and Research of Germany, which, despite the Digital School Pact for providing better technology equipment in German schools, has stated that “No technology makes a good education. It is up to the teachers, who need to be qualified to use digital technologies and teach digital competencies.”. <https://www.bmbf.de/de/wissenswertes-zum-digitalpakt-schule-6496.html>.

teachers to be digitally competent.¹⁷ The purpose of DigCompEdu is also to support development of specific digital competences of teachers, by facilitating assessment of digital competences through self-evaluation tools and identification of the needs for further training.

There is a variety of methods that education authorities can use to ensure that teachers are digitally prepared to enter the profession, as well as to be able to continuously develop and enhance digital competencies throughout their careers.

Development of digital competencies of teachers before entering the profession

One of the ways for teachers to acquire digital competences is by integrating basic digital knowledge and skills in the study programs for initial teachers' training (ITT), through teachers' competences framework and through mandatory assessment of their digital competences during ITT or before entering the profession.

In most of the EU Member States, teachers' competency frameworks include digital competencies as essential for all teachers. Most of these frameworks are based on the European DigComp and DigCompEdu, or the UNESCO ICT Competence for Teachers. Although the definition of what constitutes a teacher's digital competence varies, all frameworks stipulate that teachers need to know how to integrate digital technologies into teaching and learning and be able to use them effectively (Eurydice Report, 2019).

¹⁷ The DigCompEdu framework, published by the European Commission in 2017, defines 22 competences organized in six areas, with a focus not on technical skills but on the ways in which digital technologies can be used to improve quality and innovation in education and training. The framework applies to teachers at all levels of education, from early childhood to higher education, and adult education, including high school and vocational education, education for children with disabilities and non-formal learning. <https://ec.europa.eu/jrc/en/digcompedu>

Regarding the application of the frameworks for digital competencies of teachers, in some Member States it is not mandatory, in others it must be taken into account when developing ITT study programs, while in some Member States the framework also defines the use of digital technologies for assessing students' progress at school (Eurydice Report, 2019). In North Macedonia, digital competencies for teachers are included in the general framework for teacher competencies. Although it is used to define the needs for continuous professional development, it is not applicable in ITT.

In most education systems in the EU, assessment of teachers' digital competencies is conducted during the ITT, while a limited number of states have adopted top-level regulations for assessing these competences prior to teachers' entry into profession.

Continuous development of teachers' digital competencies

Teachers' digital competencies need to be constantly upgraded to keep up with the rapid development of technology and changes in society. This is provided through programs for continuous professional development (CPD), self-evaluation and identification of individual development needs, as well as through new forms of cooperation and exchange of experiences, such as professional learning communities and networks.

CPD in the field of digital education is supported at the highest level in almost all education systems in the EU, in a variety of ways. One of the most common ways is through training provided by national or regional training institutions, which offer a wide range of courses for the development of teachers' digital competences, including for pedagogical application of digital technology (from basic ICT skills to specialized training in the use of digital technologies in teaching

different subjects). Trainings are organized in the form of traditional face-to-face training or online courses, including through increasingly popular Mass Open Online Courses (MOOCs)¹⁸.

One of the key factors for adequate setting of CPD priorities is proper assessment of teachers' training needs. For this purpose, most education systems in the EU promote the use of self-assessment tools, namely the European Self-Assessment Tool (TET-SAT)¹⁹, or national models (Eurydice Report, 2019). It is worth noting that, in a pilot phase in the EU is a new online self-assessment tool based on DigCompEdu (provisionally called DigCompEdu CheckIn).²⁰ It aims to assist teachers in evaluating their digital competences by identifying strengths and areas for improvement, while providing them with a detailed feedback on the needs for further development of these competencies. Furthermore, with the revised Digital Education Action Plan, the EU is committed to supporting teachers in strengthening their digital pedagogy and skills for using digital tools in teaching through Teacher Academies (Erasmus), as well as through a new online teacher self-assessment tool - SELFIE for teachers (Self-reflection of effective learning by facilitating the use of innovative educational technologies) (European Commission, 2020b).

In addition to formal training courses,

18 Mass open online courses (MOOCs) for teachers on the pedagogical application of technology are also organized by the European Schoolnet Academy. They are free to attend, open to all teachers and with no limitation on the number of participants.

19 The online tool for self-assessment of digital competencies of teachers TET-SAT, was developed within the policy experimentation project MENTEP (Mentoring Technology - Improved Pedagogy) supported by the EU through Erasmus +. <http://mentep.eun.org/tet-sat>.

20 The tool is pre-tested by the European Commission Joint Research Center with small groups of teachers in different EU Member States, while during the testing phase the tool is open to all teachers worldwide. <https://ec.europa.eu/jrc/en/digcompedu/self-assessment>.

teachers can develop digital competencies through participation in professional communities and networks. Teacher networks can enhance collaboration and facilitate exchange of good practices, experiences and methods, as well as teaching materials and didactic resources. Digital teacher communities generally operate online and are part of broader platforms or portals that provide access to a variety of support such as digital learning resources, including open source resources for education and informal, online professional development opportunities.²¹ Despite the fact that participation in professional networks is not mandatory, this informal way of learning is very popular with teachers across the EU. The 2nd School Survey by the European Commission (2019a), shows that 29% of high school students and 41% of primary school students are taught by teachers who participate in an online ICT-related professional development community.

Digital teaching Resources

Both in the EU Member States and in North Macedonia, teachers' surveys point out to the availability of digital teaching content as one of the key prerequisites for effective remote teaching and learning (European Commission, 2020a; REACTOR, 2020). Hence, over the past years, the EU Member States are intensively adopting policies to accelerate the development, availability and quality of digital learning resources in primary and secondary education, while from the beginning of the pandemic, these activities are positioned high on the political agenda of the respective education authorities, including in North Macedonia.

There are various practices for stimulat-

21 In almost two thirds of European countries education authorities facilitate creation of teacher networks, and in some places there are specialized networks in digital education. In some countries, networks are set up by external institutions (e.g. universities, teachers' associations, etc.) with financial support from the education authorities. (Eurydice Report, 2019).

ing development and sharing of digital resources for teaching and learning.

In the EU, some Member States promote the use of digital resources by funding web portals that serve as repositories allowing teachers to share their own resources, or offer e-learning opportunities and/or other digital education-related services. In some countries, such portals also provide tools for assisting teachers in developing digital resources on their own, while in others, separate agencies or projects for development of digital resources have been established, or both approaches coexist. Digital learning resource policies can also support publication of e-textbooks and related materials, as well as development of digital resources not directly serving the education sector, but which can bring value to schools. In many education systems, policies include measures for ensuring the quality of digital learning resources – in some countries; digital resource creators are liable for the quality of their publications, while in others, specific quality standards or requirements are stipulated with the respective policies. (Eurydice Report, 2019).

In North Macedonia, since the COVID-19 outbreak, the education authorities are heavily engaged in motivating, assisting and organizing individual teachers to create digital content for different class subjects. Numerous video recordings are available to other teachers and the students through a separate digital portal called EDUINO, while several dozens of digital education materials are also published on the public portal of the National Platform for Online Learning.

With the Digital Education Action Plan 2021–2027, the European Commission commits to developing a European framework for digital education content, as well as to conducting a feasibility study for a possible European platform for certified online resources and linking

it to the existing education platforms in the Member States (European Commission, 2020b).

Effective planning and development of digital capacities of schools

School-level digital leadership is essential for a digital transformation of schools as well as for successful implementation of digital education policies (Microsoft, 2018; European Commission, 2020a). School principals and other managing staff are instrumental for effective planning and development of their schools' digital capacities through adoption of school digital plans, motivation of teaching staff, coordination of all activities in this area and creating a climate conducive to change and advancement.

Recognizing their key role in promoting digital education,²² national digital education strategies of some of the EU Member States stipulate training programs for school leaders (e.g. in Croatia and Slovenia), while some countries include the pedagogical use of digital technologies as required competencies of schools principals. In parallel to this practice, most EU Member States have policies for appointing school digital coordinators, with a pedagogical and technical role in implementing digital education at school level.²³ This role is usually assigned to ICT

22 2nd Survey of Schools (European Commission, 2019a) shows that positive attitudes towards the application of ICT for teaching and learning are significantly more prevalent among school principals than among teachers.

23 The pedagogical role of digital coordinators mainly includes providing support and advice to other colleagues in integrating digital technologies into teaching and using digital tools and devices, coordinating and organizing professional development or in-house training activities, teacher networking and school integration into digital communities, as well as advising school principals on the preparation and implementation of school digital plans and on promoting digital education events and activities.

The technical role of digital coordinators usually includes installation and maintenance of ICT equipment, installation and configuration of software, as well as analysis of ICT-related needs and coordination of the procurement of new equipment.

teachers, while in some Member States digital coordinators are responsible for supporting several schools (e.g. in Cyprus – elementary schools, Greece, Malta and Poland). (Eurydice Report, 2019).

A holistic approach in the implementation of digital education also requires schools to adopt plans for their digital transformation, thus ensuring that digital competencies and innovative teaching and learning methods gain a deserved place in the schools development path (Microsoft, 2018).²⁴ School digital plans usually include teaching digital competencies, pedagogical use of technology in various subjects, optimization of digital infrastructure, competences of teachers and their training, and cooperation and communication.

In some EU Member States or regions, mandatory adoption of school digital plans is regulated with strategic measures or regulation at highest level – as a separate plan or as goals related to digital education that are included in the general school development plan. In other Member States, schools are encouraged to adopt a digital plan by making it a precondition for receiving digital infrastructure grants. (Eurydice Report, 2019). SELFIE – the free online school self-reflection tool that is based on DigCompOrg – is commonly used in the EU for identifying capacity of schools to apply digital technologies in teaching and learning.

BLENDED LEARNING AS A POST-PANDEMIC PARADIGM SHIFT IN EDUCATION

The prevailing health challenges and restriction measures related to the COVID-19 pandemic that are likely to remain in place in near-term, heavily influence the education authorities' plans

²⁴ 2nd Survey of Schools (European Commission, 2019a) shows that 31% of students in primary education, 34% of students in lower secondary education and 30% of students in higher secondary education attend schools that have specific legal acts for the use of ICT for pedagogical purposes.

for school reopening after the summer break. Consequently, education researchers, practitioners and policy makers, have been heavily focused on exploring opportunities for going beyond the traditional teaching and learning, and adapting education to the new post-pandemic reality.

The ultimate goal is to transition from subject-based transfer of knowledge by deploying innovative approaches to learning and new pedagogical methods by the teachers and schools (European Commission, 2020c).

Such a paradigm shift in the “traditional” way of conducting school education – that is being considered not least by the EU Member States – is epitomized in the concept of blended learning.

Blended learning model refers to a hybrid approach that combines more than one approach to learning process – in-school learning with distance learning, including online learning – and utilizes different learning tools, which can be digital, including video-conferencing tools, as well as non-digital (European Commission, 2020a). The focal point of this approach is the student and the development of students' broad competences.

In the EU, blended learning is considered to be much more than a mere response to the pandemic-caused transformation in education, and is promoted as an embodiment of the Key competences for lifelong learning²⁵ and the vision of the new European Education Area²⁶. This is envisioned

²⁵ The Key competencies for lifelong learning were adopted in 2018, at a recommendation from the Council of the EU. They embody eight key competencies essential for citizens for their personal development, healthy and sustainable lifestyle, employability, active citizenship and social inclusion. The recommendation is a reference framework in the field of education and training, which promotes the development of competencies through innovative learning approaches, assessment methods or support for teaching staff. <https://op.europa.eu/en/publication-detail/-/publication/297a33c8-a1f3-11e9-9d01-01aa75ed71a1/language-en>

²⁶ The Communication of the European Commission on the European Education Area (EEA) from 30 Sep-

to be supported by using various learning environments - school premises and a variety of off-school sites (online platforms, home, institutions and business organizations, cultural sites), whereas digital technology is there to enable students to better connect with peers, teachers and learning sources, allowing for a more personalized learning process that is more effective and inclusive.

Nevertheless, blended learning does not represent a mere combination of different learning environments and digital tools, but is a teaching and learning process that integrates other important factors, such as the “affective domain (motivation, satisfaction, discouragement, frustration), and people (learners, teachers, parents, other staff)” (European Commission, 2020c). Hence the need to incorporate it in the overall process of development of schools and all associated stakeholders.

According to the European Commission *Guidelines on blended learning in school education* (2020c), there are numerous benefits of the blended learning to students, namely: it enables competency-based approach with the learner in the centre of the educational process; students are no longer passive receivers of information and teachers are not the only trainers; teachers can provide better support to students through differentiated and personalized teaching; it increases learners’ autonomy and motivation; improves learning skills of students towards becoming self-directed learners; supports the development of digital competence (conditioned on using relevant digital tools); and allows better support to learners with specific needs. On the other hand, the periods spent at school premises will serve students in developing their social skills, well-be-

ing and sense of community, as also in receiving more personalized support by teachers. Blended education can also support learning of students in remote and rural areas, as also in case students are prevented to attend in-school classes due to illness or travels, or in crisis situations (European Commission, 2020a).

The potentials of hybrid campuses, as elaborated at the recent 2021 EU Annual Conference “Universities 2030: From vision to reality”, include: addressing unequal access to education; achieving economies of scale; promoting innovative forms of learning, cooperation and communication; expanding existing learning opportunities, and meeting the needs of a changing demography (Dimitrov, 2021).

Nevertheless, there are still certain concerns and challenges associated with effective implementation of the blended learning concept, which reflect the experiences with the emergency remote teaching during the pandemic. Namely, the mentioned Guidelines (European Commission, 2020c) take a duly note of the fact that: implementing a coherent pedagogical approach, which would effectively couple in-school teaching with flexible remote learning, requires a well-designed strategy and highly competent teachers and principals who are fully dedicated to change; effective blended learning necessitates a fundamental change in the education systems and the supporting mechanisms (legislation/regulation, professional development of teachers and school management, quality assurance, etc.); and finally, younger students may have some struggles with independent learning as they naturally have less control over time, place, or pace of learning. In addition, and despite research showing otherwise²⁷, online learning can be perceived

tember 2020, paves the way for achieving the EEA by 2025, through initiatives that provide all young people with access to high quality higher education and training and employment throughout the EU.

²⁷ According to certain studies, blended learning helps students achieve better academic outcomes. Two meta-analyses have confirmed that students who utilized blended learning performed better than those in

as being of lower quality than in-school instruction (Hodges et al, 2020).

Whilst these challenges need to be taken seriously and addressed systematically and comprehensively, the pandemic has proven that transformation in education is possible (and desirable).

However, if it is to become a positive experience for all educators and learners alike, the implementation of a blended learning model would require a holistic approach and adequate planning coupled with sufficient support, resources and guidance. Digital platforms and tools are vital but many other considerations need to be adequately addressed. Namely, teaching and learning remotely requires a fundamentally different approach to designing the teaching and engaging the students (Bacsich et al, 2012), and necessitates capacity for effective use of technology and learning environments, as well as for broad pedagogical, and organizational change (European Commission, 2021).

Hence, the design of a concrete blended learning approach may differ at a level of a particular school or individual class teacher, depending on various factors such as: age, learning competences of students and extent of their learning autonomy; curriculum in terms of content and learning outcomes; availability of adequate digital infrastructure (computers, Internet connectivity, digital platforms, interactive whiteboards); digital competences of teachers; and schools' pedagogical culture (Staker, H., & Horn, M. B., 2012 as cited in European Commission, 2020c).

To this end, in early April of this year, the European Commission has prepared

traditional classroom environments by over 33 percent of one standard deviation. Microsoft (2018).

Yu, Zhonggen (2015) as cited in European Commission (2020c), also notes that sole online or in-school education may produce larger deficits compared to blended learning.

a Roadmap (2021) - a proposal for a Council Recommendation on online and distance learning for primary and secondary education, which has, at its core, the concept of blended learning and is intended to serve as a common vision for implementing this model at the EU level.

DISCUSSION

Although constructed in an entirely different context and time, the quote by Vladimir Ilyich Lenin "There are decades when nothing happens; and there are weeks when decades happen" best pictures the sluggish progress in digital education over the past decade and its abrupt rise to prominence during the COVID-19 pandemic.

Namely, the key factors for effective and inclusive digital education have been known for years. Numerous studies have been dedicated to exploring their importance and contribution to a functional and effective remote teaching and learning, while various surveys at national and supra-national level have been conducted to assess the preparedness of different segments of the education systems to that end. Findings and recommendations have been translated into top-level strategic documents, policies, frameworks and legislation - not least in the EU, where the Digital Education Plan for 2018-2020 was enacted with an aim to help Member States transform their education systems for the digital age.

Notwithstanding the above actions, with notable exceptions, the health crisis has caught the education systems in the EU Member States inadequately prepared to swiftly and effectively adapt teaching to the new circumstances and continue the education process uninterrupted (European Commission, 2020a). The pandemic has abruptly revealed the structural challenges for remote practices in education - particularly in terms of dig-

ital competence, Internet connectivity and infrastructure - resulting with inefficiencies and unequal access to learning opportunities for all students.

In North Macedonia, the abrupt and un-timely-planned integration of digital technologies in the education system has revealed many of sector's structural challenges - not least insufficient or obsolete digital infrastructure; teachers and students lacking digital devices and Internet access, particularly pronounced in disadvantaged families; deficient digital capacity of schools and teaching staff, etc. These shortcomings remain to create a major concern for inclusion, particularly of children from disadvantaged families lacking Internet access and digital devices for online learning, as well as of students needing additional learning support and assistance.

On a positive note, the identified challenges and their implications on the quality and inclusiveness in education have now been confirmed in practice, and can serve as steady and concrete guidelines for future actions by policy makers towards strengthening the digital capacity of schools and further developing the overall digital education ecosystem.

Furthermore, despite the fact that the emergency remote teaching in 2020 has been a rollercoaster experience for the education authorities, teachers, students and the overall communities, it has also been a rewarding one as it has showcased the advantages that digital technologies and distance learning can bring to students, teachers and the overall education system and processes.

Digital technology is confirmed to be a powerful tool that can transform the way we teach and learn, however its application in education is undoubtedly a complex process that involves multiple stakeholders and requires massive structural changes.

Focusing on designing and implementing a process that will facilitate digital transformation of the education systems is particularly important in the coming months, as many countries are considering applying a blended learning approach in school re-opening for the next academic year. And, despite the fact that the design of a concrete blended learning model will differ between systems, or even between individual schools or teachers - depending on various factors discussed in previous sections - policy makers will need to ensure well-planned and systematic investments in building up capacities for effective use of digital tools and learning environments, as well as capacities for organizational and broad pedagogical change.

Foreseeing the future of digital education, the question is not whether it is here to stay,²⁸ but how well the education systems will be prepared to deliver quality and inclusive education in support of broad competence development of all learners, aligning education with the requirements of job markets, the priorities for green transformation and equitable growth, and in general with the digital age we all live in.

RECOMMENDATIONS

The fact that different countries go through different stages of digital development of their education systems, economies and societies, will influence the selection of priorities of the public policies in this domain. Furthermore, the scope of investments in aforementioned capacity building will be affected by the available fiscal spaces, which are being

²⁸ Public Consultations in the EU, held in the summer of 2020 for the purposes of renewing the Digital Education Action Plan, show that 95% of respondents believe that the pandemic is a point from which there is no turning back when it comes to the use of digital technology in education (European Commission, 2020a).

increasingly limited in developing countries, particularly after the steep, pandemic-related increase in public debt.

Hence the need for a carefully-designed policies and actions that are utmost effective in addressing country-specific challenges as well as in targeting the needs of individual education systems and schools.

In North Macedonia, the process of digital transformation of the public education system will prove a complex process that entails massive structural changes. It will necessitate a holistic, systematic and coherent approach in effectuating policies and activities on multiple fronts, not least in advancing schools' digital infrastructure and resources, ensuring top-level strategy and school leadership, furthering development of teachers' digital skills, supporting creation of digital content, modernizing curricula, pedagogy, as well as implementing quality assurance mechanisms.

Therefore, despite the fact that certain elements of the digital education concept are integrated in the proposed National Strategy for ICT 2021-2025, there is a clear need for enacting a digital education strategy. As a comprehensive, top-level policy document, designed in an all-inclusive process effectively involving multiple stakeholders, the strategy should address the structural challenges in the education sector identified during the health crisis and offer a holistic and long-term vision for continuous advancement of all components of the digital education ecosystem.

This further reaffirms the need for a forward-looking strategic planning and operational leadership in Government and particularly in education authorities, to effectively design and enact digital education strategy and effectuate digitalization of all public primary and secondary schools across the country.

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