ONLIFE: Empower hybrid Competences for Onlife Adaptable Teaching in School Education in times of pandemic

IO1 Guidebook

# Patterns for enhancing digital technologies in School Education

ISBN 978-83-8084-796-5

Co-funded by the Erasmus+ Programme of the European Union

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## *Case Studies: Digital Technologies in School Education: from the European vision to the school governance*

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# *"Empower hybrid Competences for Onlife Adaptable Teaching in School Education in times of pandemic"*

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## Contents

# 1. Introduction

## 1.1 Research Context

Worldwide, in early 2020, governments decided to temporarily close educational institutions in an attempt to minimize the spread of the COVID-19 Pandemic, which has created significant challenges for those in education.

The COVID-19 pandemic forced countries and regions to adopt emergency conditions, which resulted in the closing down of schools and the implementation of strict social distancing measures. Eventually, 188 countries in the world shut down all schools or localized them in some cases to avoid the spread of the virus. According to UNESCO (2020a) this affected 1.576 million children and youth affection the 91.3% of the world's student population by April 2020 (Figure 1) and eventually more than an estimated 1.7 billion learners were affected by school closure in 192 countries impacting on approximately 99.9% of the world's student population.

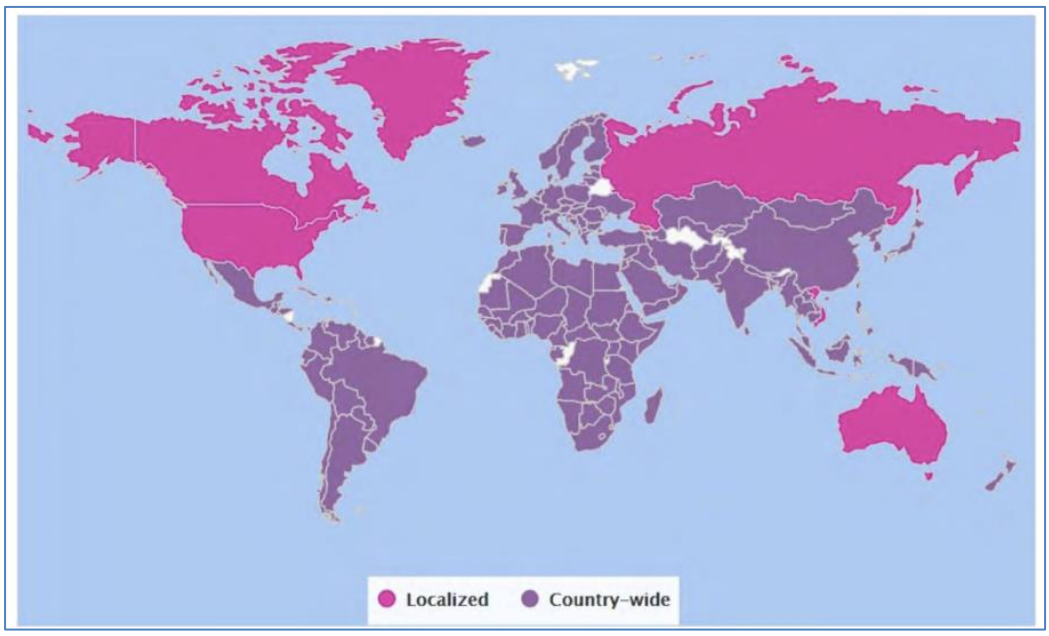


Figure 1: Countries that have shut down or localized schools in the world.
Source: UNESCO (2020b). UNESCO Report, 'COVID-19 Educational Disruption and Response'. https://en.unesco.org/news/covid-19-educational-disruption-and-response

The enforced closure of educational institutions from March 2020, as a consequence of the COVID-19 global pandemic, resulted in a rapid shift to 'emergency remote teaching' almost immediately featuring completely online learning, teaching and even assessment (Crick, 2021). This was driven by necessity and a lack of alternative options. According to Tolks et al. (2020) the design of online teaching at this time was strongly dependent on existing resources, digital skills, time frame and the available technical infrastructure, which were heterogeneous in different educational institutions.

According to Anderson (2021), most countries made heroic efforts to find ways to deliver learning to students during lockdown, many involving some form of remote teaching. The pandemic forced schools to go online. Teachers as well as students were exposed to new communication platforms such as Microsoft teams, Google hangouts, Zoom and others, as well as co-creation and collaboration tools available on Google drive.

UNICEF (2020) said:

"*There are many considerations in undertaking the challenge of educating persons in the "new normal" circumstances. The most poignant emerging questions focus on whether current*

*provisions are suitable, sustainable and whether teachers and learners can experience a fulfilling and productive education journey, using current methodologies. There is the question of accessibility to devices and internet services, teachers' capabilities in using the technology efficiently and learners and parents' adaptability to the technology. Furthermore, inherent inequalities in access to tools and technology threaten to deepen the global learning crisis*."

UNESCO (2019) commented that the shutdown of educational institutions hampers the provision of essential services to children and communities, including access to nutritious food, deprivation of socialization and psychosocial support. They suggest there are real concerns about interrupted learning especially related to parents, teachers and students being unprepared for distance and home schooling. Furthermore, challenges have emerged regarding creating, maintaining, and improving distance learning services.

### 1.2 Objectives

This is the first output of the ONLIFE Project. The principal objective of this report is to understand, as a result of the review of literature and case studies, the ways in which schools have employed ICT resources in response to the Covid-19 pandemic, the digital challenges they faced in trying to maintain and promote learning, inclusion and innovation in their schools.

At a macro level, the purpose is to review and elaborate a theoretical framework and main policy developments concerning the integration of digital opportunities in school education. At a meso level, the analysis, established using a sociological and organisational approach, aims to understand organizational processes in promoting digital innovation in schools, in order to extract orientations; best practices; standards and constraints, with the intent to produce useful suggestions for policymakers, decision-makers and school system bodies to build a European e-learning school education area, founded on the teachers' professional development and European quality assurance standards.

The main goal of the report is thus to provide an insight into the changes and challenges of COVID-19 regarding the educational system, and to discuss potential solutions. In this report the impact of COVID-19 on digital education is presented and recommendations for education are discussed.

### 1.3 Methodology

Output 1 involves all partners in the ONLIFE Project. It consists of two phases, the first phase is focused on the elaboration of a Guidebook "Patterns for enhancing digital technologies in School Education" and the second phase consists of national reports to exchange good practices in education responses in the COVID-19 era. This will describe the effects of COVID-19 on School Education and specifically on the implementation of digital tools and technologies. It will introduce theoretical aspects, problematize the issues faced by education and propose recommendations and ideas to be shared within the ONLIFE research group and prepare the next research steps. The guidebook is set in the context of European resolutions and recommendations including the European Digital Agenda; Digital Competence Frameworks; the modernization of School Education and Quality Assurance for E-learning. It will present a series of case studies to inform the remainder of the project.

The guidebook includes:

- a brief theoretical framework on the adoption of ICTs in school education;
- a review of policy and
- the case studies.

This report offers a detailed documentary analysis of the latest academic and professional literature, a reflection on some theoretical principles and recommendations. Each country partner elaborated a National Research Report necessary to arrange the comparative Case Studies Report "Digital Technologies in School Education: from the European vision to the school governance". This comparative report takes into account all suggestions emerged during the transnational and virtual meetings.

The national research reports have been prepared to include the following dimensions of analysis:

- an introduction to the report and methodology;
- the reconstruction of the national political framework related to the adoption of ICTs in SE;
- a documentary analysis related to principal documents adopted by case study schools;
- a qualitative analysis of the focus group and interviews results.
  This qualitative research will include the following topics:
  a) main and most interesting experiences in the field of enhancing ICT in school education;
  b) strategies and experiences in the field of teachers' professional development for the digital era;
  c) main and interesting experiences in the field of recognition and validation teaching competences with particular attention to digital skills;
  d) main and interesting experiences in the field of quality assurance in school education with particular attention to elearning quality standards;
  e) strengths, weaknesses, risks or opportunities for School System Bodies in promoting ICT in school education;
- needs and perspective of improvement;
- a quantitative analysis of the questionnaires' results;
- a conclusion oriented to outline the most important efforts and critical issues in organizational and educational processes aimed to enhance digital resources and environment in schools.

## 2. The ONLIFE Initiative

Onlife is a term coined by Luciano Floridi (2015) to express our lived experience of the 'ever-increasing' pervasiveness of information and communication technologies in society. In order to address the impact of information and communication technologies (ICTs) on the human condition, in 2012 the European Commission organized a research project entitled 'The Onlife Initiative: concept reengineering for rethinking societal concerns in the digital transition'. It explores how the development and widespread use of ICTs have a radical impact on the human condition.

Technology increasingly defines more and more of our daily activity, the way we shop, work, learn, care for our health, entertain ourselves and conduct our relationships. It outlines the way we interact with the worlds of law, finance, and politics, the way we conduct every part of life. Onlife concerns the set of actions and relationships that a person performs and has when he/she has when he/she is both connected and disconnected.

According to Floridi (ibid) ICT has generated at least four major transformations: i) blurring the distinction between reality and virtuality; ii) blurring the distinction between human, machine and nature; iii) the change from information scarcity to information abundance; and iv) the shift from stand-alone things, properties, and binary relations, to the importance of interactions, processes and networks.

Living in the era of onlife, the ONLIFE Erasmus Plus Project relates to the surprising distance that school is when compared with our daily lives. The hybrid media practices that we constantly experience in life appear largely unrelated to the school setting where a certain digital scepticism is predominates.

# 3. The impact of the COVID-19 pandemic

The sudden Covid-19 outbreak shook the entire world. The pandemic caused by COVID-19 has had profound consequences on social, economic and cultural life worldwide, and is still affecting, throughout the world, the regular functioning of educational institutions at all levels, with their temporary shutdown and the impossibility of face-to-face classes.

Dobrilă (2020) confirmed that the coronavirus pandemic changed the education process as governments took actions to mitigate the effects of the pandemic and reduce the transmission of Covid-19. The situation challenged education systems and forced educators to shift to an online mode of teaching overnight. Many academic institutions that were earlier reluctant to change their traditional pedagogical approaches had no option but to shift entirely to online teaching–learning.

König et al (2020) described the circumstances by which teachers were obliged to adapt their practice and to incorporate online teaching. Velicu (2021) confirmed that:

"*Teachers felt they were left on their own when they were asked to create their own digital content, with no support whatsoever. …. The Ministry provided, upon a simple Internet search, a list of applications or platforms that could be used, but it's one thing to create a classroom on these learning management system types of applications and it's another to get the proper content for online teaching*.".

### 3.1 The impact on schools and teachers

"*The school lockdown confronted teachers, students, and parents with an entirely new situation*"….. "*Continued teaching and learning was only possible through alternative means of schooling. Teachers had to change to online teaching, requiring them to use various digital tools and resources to solve problems and implement new approaches to teaching and learning*" (König et al., 2020).

Because the closing of schools occurred quite rapidly, teachers had little time to plan for teaching remotely. Not surprisingly, then, many teachers continued to teach the way they did in regular classrooms (Anderson, 2021).

A considerable amount of research has been published concerning the impact of the pandemic on schools and teachers. Sunita (2020) showed that COVID-19 had adverse effects on education including, learning disruptions, and decreased access to education facilities and teaching and learning resources. Under Covid, it was clear that the education world became heavily reliant on technology to ensure learning continued but predominantly online but in the home. However, online education was hindered by poor infrastructures including, network, power, inaccessibility, and unavailability issues, compounded by poor digital skills.

Historically, schools and teachers have been characterized by a resistance to change, including the resistance of teachers to adopt the use of ICT for teaching and learning and the opposition to a change in their role or to develop their skills and role. As the situation created by the pandemic introduced an unprecedent element of destabilization, schools had to adapt to 'forced distance teaching' (Benassi et al., 2020). The urgency of the situation removed dimensions of intentionality typical of distance teaching and training which are implemented by choice. All of a sudden, teachers were looking for digital tools to deliver learning materials to their students and organize communication with their classes.

"*No managerial strategies, no teacher training, no debates on technological design or politics, no arguments about the pros and cons—we just do it*." (Kerres, 2020)

Ciurmelli and Izzo (2020) explored the impacts of COVID-19 on schools and the profound reorganization of teaching activities, with consequent impact on the psychological and

pedagogical dimensions of teachers, students and parents, analysing the critical issues linked to a reshaping of the teaching strategies due to the pandemic's outbreak. Williams et al. (2021) used a phenomenological approach to explore the COVID-19 distance learning experiences of teachers. Those involved reported that although their students experienced inequities in both digital access and digital efficacy, the greatest issue concerned access to technology.

The initial loss and uncertainty in schools, not exclusively referable to the digital skills of staff, generated disorganization and difficulties mainly due to the drastic change of context that did not allow effective monitoring of the effectiveness of their teaching actions and the actual acquisition of knowledge and skills and, above all, it forced to redefine the relationship with the students.

Mulenga and Marbán (2020) indicated that digital learning was in fact a positive response to COVID-19 closure period for schools. Dhawan (2020: 17) reported on the constructive nature of the reaction by teachers and schools:

"*amidst this crisis, we have no other alternative left other than adapting to the dynamic situation and accepting the change. It will be beneficial for the education sector and could bring a lot of surprising innovations. We cannot ignore and forget the students who do not have access to all online technology*".

The impact of lockdown was not uniform across Europe, it varied in different European countries. For instance, König et al. (2020) reported that in Germany – as in other European countries, such as France or Italy – many schools lag behind with respect to the expected information and communication technologies (ICT) transformation progress. In Sweden, Begdahl and Nouri (2021) identified early education responses to the pandemic marking the transition into what they describe as crises-prompted temporary distance education. The Swedish National Agency for Education eventually allowed the use of hybrid classroom, and added that teachers with symptoms were allowed to engage in remote teaching from home.

Teacher surveys identified the maintenance of social contact with students and their parents as being important, with the core challenges of teaching through online environments, the delivery of online lessons with teaching and learning interaction, particularly to facilitate whole-class assignments (Eickelmann and Drossel 2020). Teachers were concerned about enabling students to access a substantial part of the school year's curriculum content from home. The introduction of (new) learning content was another challenge. Teachers expressed the wish to adopt a blended configuration for future teaching activities (Giovannella et al., 2020a).

Moreno and Gortazar (2020) addressed the effect of the pandemic in relation to PISA results. Even in rich countries where Internet connectivity was all but universal and there were still digital gaps illuminated by the COVID-19 crisis. These were i) the digital use gap: where students operate without direction, thus engagement with online content is less sophisticated and less learning-oriented for those from poorer socioeconomic backgrounds, and ii) the school digital gap: which concerns the capacities and capabilities of each school to provide individualized, or suitably levelled and sequenced, digital learning for students; to promote and monitor engagement with these materials; and provide to feedback that helps maximize learning outcomes.

Molnár et al. (2020) examined the way Serbia and Hungary responded to the pandemic and the virtual and augmented learning spaces and presentation methods used in education. In Serbia from March 2020, education was organized in the form of distance learning as traditional education was completely discontinued. The Ministry adopted an operational plan with a large number of different programs and alternative digital ways of teaching and learning in preschool institutions, and in all grades of primary and secondary school. The focus

was on organized distance learning that contributes to the implementation of general education subjects and professional subjects with classes. Contents was broadcast on TV channels and available for download. In Hungary the following recommendations were made by the Government, all students should be given opportunities to learn and teachers were asked to be flexible. Pedagogues functioned as the sources of information and transmitters of knowledge in charge of the development of various student skills. Teachers function as a guide or tutor supporting, motivating, and directing independent learning. Each school selected a digital platform and made it available to the students.

A strong spirit of adaptation appeared to be shown by the teachers is due more to the good effort and commitment released by the passion for their work than by a real redefinition of their skills or a previous didactic-technological competence. This adaptive disposition allowed them to face immediately, in most cases, the emergency and to propose an online teaching through platforms, applications and digital materials largely unknown until that moment.

Scully et al. (2021) reported on a survey of secondary school leaders in Ireland, conducted three months after school closures. Leaders' beliefs about technology, digital practices before the pandemic and responses to the emergency are considered. The findings suggest that leaders are positively disposed towards technology, and that, prior to the crisis, approaches to digital learning were aligned with some best practice recommendations. Although schools endeavoured to continue provision during the closures, challenges were reported, particularly in rural schools and those serving disadvantaged cohorts.

Giovannella et al. (2020b) analysed teacher perspectives, experiences and perceptions about education in Italy two months after the beginning of the COVID-19 pandemic lockdown when the use of on-line education reached a steady state. The study intended to provide an early contribution to the understanding of what has been school education during the pandemic, an historical documentation, a point of reference for future similar studies and a first step towards a collective reflection on possible developments of Italian educational system in view of fostering policy decision making.

The survey results indicated that most educational institutions and individual teachers were able to respond to the needs of most students, but there was a significant increase of teacher workload that posed considerable time management challenges. The perception of teachers was of increased digital skills ownership, however they tended to adopt teaching strategies that reproduced standard classroom dynamics rather than those related to online needs and approaches. The survey identified there was a change in the mental setting as the perceived sustainability of on-line education increased in a third of the teachers. Content sharing and community building among teachers was common and there appeared to be a wish to adopt a blended configuration of activities in future teaching activities. This suggests most participants in the study recognised the relevance of 'digital pedagogy' and the need to include it in the training curricula to prepare future teachers (ibid).

Begdahl and Nouri (2021) asked teachers whether they or their schools had a strategy in their response to lockdown and what that strategy entailed. The majority of the teachers reported that their school had no strategy to implement distance education. Even fewer reported a strategy to respond to a school closure, which was quite understandable given the swift change that Covid-19 responses implied. Some teachers reported they had allocated time to prepare with colleagues, while others mentioned they were left to their own devices, with little or no support. Some teachers confirm that schools had digital strategies and agendas, but pointed out that the policies or guidelines were either significantly outdated, or that digital strategies were not sufficient in response to such a crisis. Instead, teachers seemed to work pragmatically with what they had rather than intensively expand on their experiences and gather new skills. The results reflected a set of disperse and incoherent ways that schools adopted to tackle the extraordinary circumstances.

Sunita (2020) considered the challenges of implementing distance learning, which included:

- online education hindered by poor infrastructures and inaccessibility, including limited availability of internet and inadequate access to devices. Teachers and learners described slow connectivity as disruptive and interfering with the smooth flow of teaching and learning
- the tendency to use existing course content and experiences unsuited to online modes of learning for the same/unmodified curriculum and syllabus, this was related to having insufficient time or expertise to adjust materials for online learning, as resources and tools must be re-versioned, repackaged and adapted to the needs of the audience, ensuring that they capture and maintain the attention and interest of students
- poor digital skills highlighted for teachers and parents, teachers also highlighted that although they were introduced to broad concepts related to distance and online learning, they felt the need for more focused and specialized training sessions, especially related to the use of learning management systems and online teaching tools
- curriculum imbalance was noted, with students assigned many homework tasks, leaving little room for extra-curricular activities and overall balance and holistic well-being.
- parents struggled to keep-up with and support their children's education, with the vast majority admitting to being frustrated having to supervise their children throughout the day.

Crăciunescu et al. (2020) stated

"*In the last school year, right from the spring of 2020, the teaching-learning-assessment process suffered a major disturbance caused by the COVID-19 pandemic. The teachers had to discover and apply alternative methods to continue the educational act. To cope with evolution dynamics of the changes, many teachers have developed their capacity for analysis, becoming more creative and inventive so that online educational activities capture students and determines to master the transmitted contents.*"

### 3.2 Learning at home

In high-income countries, the closure of educational centres was alleviated by providing the necessary coverage from home (Lorente et al., 2020). Thus, to a large extent, both the support and the necessary connection for the online learning of children and young people in homes, often supervised by teachers, accompanied by mothers and fathers, was ensured. Confinement at home as a consequence of Covid-19, gave prominence to the use of ICT for maintaining basic education and learning.

According to the World Bank (2020a), the impact of the crisis was not equally distributed. In poorer countries most schoolchildren have not been able to enjoy these facilities for distance learning, nor did they have the same opportunities. The most disadvantaged children and youth had the worst access to learning, the highest dropout rates, and the largest learning deficit.

Montenegro et al. (2020) analysed this from the teacher's perspective, considering the impact of the digital divide on the achievement of learning outcomes at home based on a survey of teachers in a Spanish region. The results indicated that the fulfilment of basic academic objectives was directly related to the access to the technologies and this to the purchasing power of the families, interrelated with the complex action of other factors such as the characteristics of the students (degree of autonomy motivation), the digital competence of those involved (students, teachers, families) and the requirements both structural and organizational of education administration. From the teachers' perspective, the higher the economic level, the higher the minimum learning objectives achieved. This same trend was also observed in terms of the availability of digital devices and Internet connection.

From the point of view of parents, according to Ciurmelli et al. (2020), the methodology adopted by schools and teachers appeared to be immature, not replicable and not very functional compared with traditional teaching. They recognised the efforts of teachers, praising them for having been able to reorganize and guarantee an educational presence and continuity in the design, but in the long term, parents saw a dramatic decline in the effectiveness of online activities and home learning, probably due to the fact that they have passed from one mode to another without any specific training. In addition, there was a persistent problem linked to the use of devices, despite the use and availability of technology for recreational purposes, the contemporaneity of remote activities in larger families limited its availability.

For the students, mostly teenagers, the greatest upheaval was the impossibility of keeping relationships alive and stable with their friends and classmates, but also with both positive and contrasting reference figures such as their teachers (d'Orville, 2020). Their ability to glimpse positive aspects even in a global emergency was sufficient to make them appreciate the specific aspects of the new educational organization at home: not having to wake up early to go to school and not having to depend mainly on teachers for the organization of the study and material.

Gupta and Jawanda (2020) focused on the effects of the Covid-19 pandemic on children and especially the severe impacts on children from disadvantaged backgrounds. Positive aspects were cited, such as the opportunity to learn educational methods that will benefit them later in life and to get involved in different physical, learning and creative activities. They suggested travel restrictions may have improved the relationships between parents and children by spending more time together. However strong negative impacts on the social interaction and development of children were reported, with poorer communities no longer having access to basic educational resources (schools, libraries), deepening, the differences between social classes.

Lorente et al. (2020) dealt with the effects of the closure of schools, the right to education and its relationship to the spread of COVID. They discussed how COVID-19 has exacerbated inequalities and pre-existing problems in education systems around the world. Their research compared the institutional responses during this educational crisis in different regions around the world.

Williams et al. (2021) found that educators dealt with digital inequities by putting in extra work and shifting their mindsets. They persevered and worked long hours beyond their contracts to overcome the challenges. Although it seems educators were overwhelmed and exhausted with the amount of uncompensated time and energy they had to put in during the pandemic, the investment of extra time and energy resulted in positive outcomes for them and their students.

A small group of countries were prepared to offer universal e-learning through learning platforms, while the vast majority countries had significant barriers to making remote education possible or sustainable for all students (Lorente et al. 2020). It showed an uneven capacity in terms of response and preparation to face the learning losses derived from school closure, both in low-income regions and within middle- and high-income countries (Figures 2 and 3).

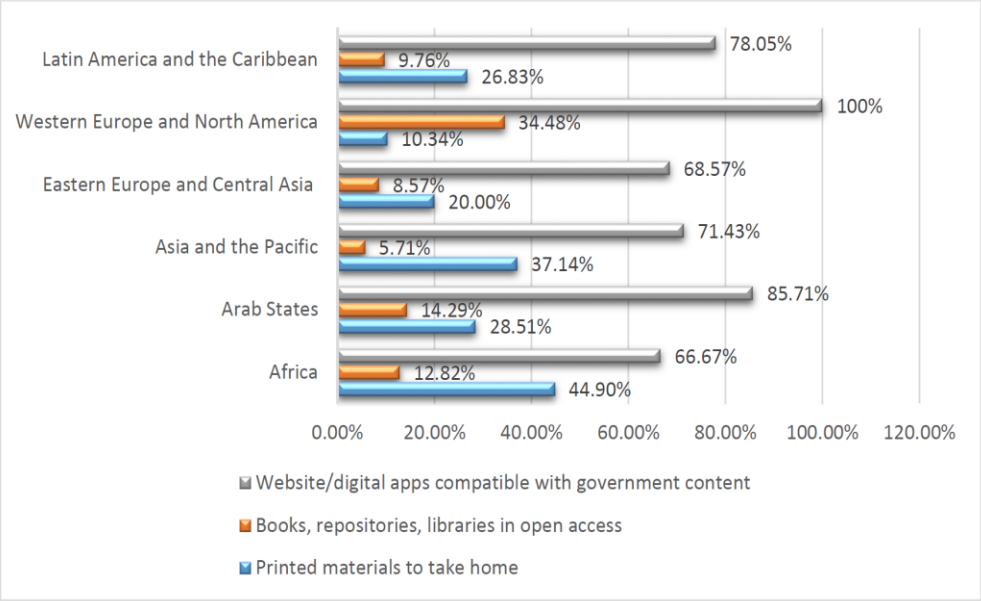


Figure 2: Regional percentages of the use of learning platforms and tools by type (UNESCO, 2020c)

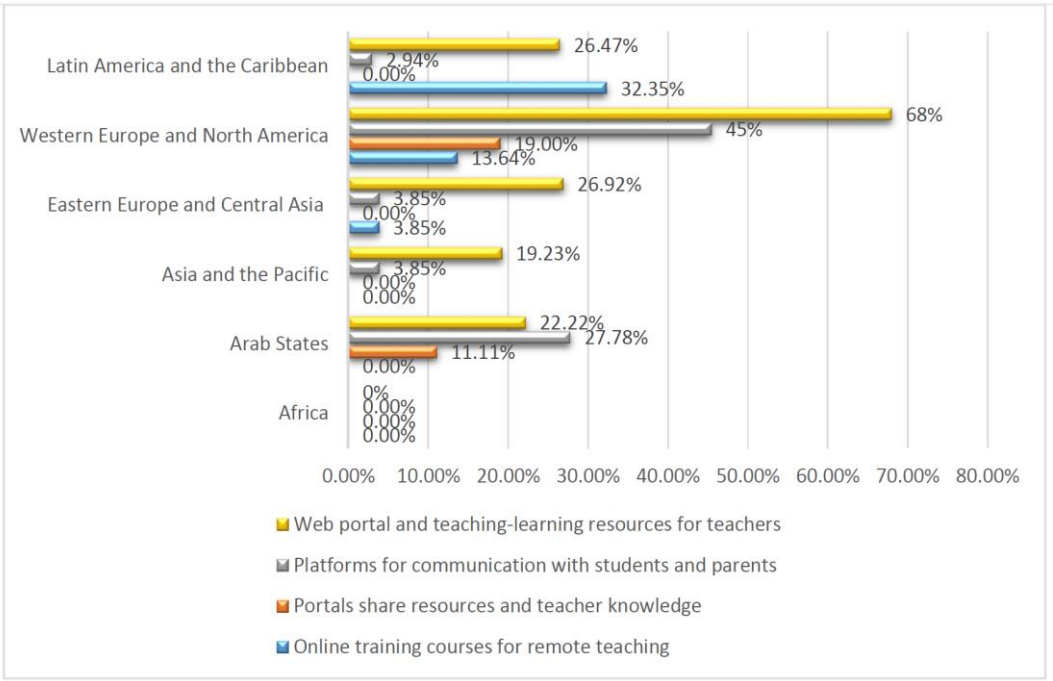


Figure 3: Percentage of countries by region that have developed learning platforms and tools for teachers after COVID-19 (UNESCO, 2020c)

Results from various national and international surveys examined by Anderson (2021) suggested there were four main modes of learning and teaching in place: take-home materials, radio, television, and online platforms.

UNESCO (2020c) took the initiative to coordinate the action 'Global Education Coalition' that supported learners, teachers and even governments throughout the recovery period. The Coalition was composed of multilateral organizations such as UNICEF and The World Bank, private sector companies such as Microsoft and Google, non-profit and philanthropic organisations such as Dubai Cares and Sesame Street and media outlets such as BBC World.

The Coalition attempted to:

- Match needs with free and secure solutions
- Provide digital tools and learning management solutions
- Upload national digitized educational resources
- Curate resources for distance learning
- Strengthen technical expertise

As schools began to reopen, according to Anderson (2021), hybrid modes of instruction began to appear. Marchesi et al. (2020) reveal the results of a "Back to Class" survey of the IDEA Institute of Evaluation, in which 1,000 schools, 162,000 students from 10 years of age and 19,000 teachers participated. The main findings were that students and teachers believed that distance education worsened learning and students experienced significant emotional and academic deficiencies. Students in upper grades were the ones who had the worst emotional and academic experience, where the difficulty of the studies was greatest and the responsibility of the teacher was highest.

Most teachers (95%) preferred face-to-face approaches. However, in primary schools, 25% of students would choose to be taught at home, where the family environment offers the most security, and online education benefits children who learn at a different pace, because it is more flexible.

According to Di Pietro et al (2020), four main conclusions seem to emerge concerning the impact of COVID-19 on education. First, despite the widespread move to online teaching, student learning suffered and student progress was not the same as if schools were open. Although online learning provides potential, it would be more effective in circumstances where students and teachers have the time to prepare and get used to it. Unfortunately, in most situations this did not happen as COVID-19 forced educational institutions to make a sudden switch to online learning. The results of a School Education Gateway survey conducted between 9 April and 10 May 2020 showed that during the lockdown the majority of teachers (66.9%) had to teach online for the first time and many teachers had problems in accessing technology (computers, software, reliable internet connection, etc.).

Secondly, the effect of COVID-19 on students' achievement varied according to socio-economic status. Students from less advantaged backgrounds were likely to experience a larger decline in learning compared to their more advantaged counterparts.

Thirdly, during the emergency period inequality in socio-emotional skills also increased as children from lower socio-economic status were more likely to be exposed to a stressful home environment than their peers from higher socio-economic status. Parents from more advantaged backgrounds were likely to be better equipped in terms of socio-emotional skills to handle problems emerging during a long confinement period.

Finally, the widening social gap in both cognitive and socio-emotional skills caused by COVID-19 may have implications not only in the short-term, but also in the long-term. This increased inequality is likely to persist or even increase over time, having consequences on later educational outcomes as well as future labour market performance.

## 4. Simple theoretical frameworks

Few attempts at dealing with theoretical frameworks were described in the literature. Fullan (2020) asserted that the pandemic has presented an opportunity to reimagine and transform education. He argued that we are experiencing a three-phase process. Phase 1 began with the disruption caused by the pandemic, the closing of schools, and the rapid shift to remote learning. Phase 2, was labelled as a transition phase, as it concerns the reopening of schools while the pandemic was still creating uncertainty. In Phase 3, a vision for an educational approach will need to be carefully laid out that enables all students to thrive and prepares them with skills to navigate change. It requires drawing from the best of traditional approaches, innovative practices, and insights from remote learning to shape new, flexible, agile, hybrid learning models (Anderson, 2021).

Bogdandy et al. (2020) examined the digital transformation forced on education by surveying students on the experience, feelings and overall expression regarding digital education and recent changes under Covid. They found that the digital transformation of classes was not smooth and without challenges. The results confirmed that students enjoyed digital education and half of them would be willing to continue it in the future, especially if they can use their own devices during classes. Unfortunately, there were technical issues which may be caused by the heterogeneous software environments and could be solved with support material.

## 5. SWOC Analysis

Soobrayan et al. (2020) said

"*While the pandemic has significantly disrupted teaching and deepened inequalities, it has also provided opportunities for transforming pedagogy and transforming the school environment: new ways of teaching and learning, new ways of communicating with children and families, new roles for growth. the general level of well-being of students*."

Dhawan (2020) dealt with the importance of online learning and its Strengths, Weaknesses, Opportunities, & Challenges (SWOC) in an analysis of e-learning modes in the time of crisis (Table 1).

Table 1: A SWOC Analysis of e-learning (Dhawan, 2020)

| | |
|---|---|
| STRENGTHS<br>1. Time flexibility<br>2. Location flexibility<br>3. Catering to wide audience<br>4.Wide availability of courses & content<br>5. Immediate feedback | WEAKNESSES<br>1. Technical Difficulties<br>2. Learner's capability & confidence level<br>3. Time Management<br>4. Distractions, frustration, anxiety & confusion<br>5. Lack of personal/physical attention |
| OPPORTUNITIES<br>1. Scope for Innovation & digital development<br>2. Designing flexible programs<br>3. Strengthen skills: problem solving, critical thinking, & adaptability<br>4. Users can be of any age<br>5. An innovative pedagogical approach (Radical transformation in all aspects of education) | CHALLENGES<br>1. Unequal Distribution of ICT Infrastructure<br>2. Quality of Education<br>3. Digital Illiteracy<br>4. Digital Divide<br>5. Technology cost & Obsolescence |

E-learning can provide very positive outcomes increasing the accessibility, affordability and flexibility of the learning pedagogy applied. E-learning skills tend to enable and encourage life-long learning. E-learning methods and processes can be designed to offer really effective learning approaches as they can be student-centred and they can provide 24/7/365 opportunities in terms of time and anywhere location. Online learning allows teachers to customize education based on the personalised needs of the learners. The benefits noted were also better time management and self-development, more engagement for students with health problems and those that were normally silent in classrooms (Velicu, 2021).

"*In online learning, students can use the online learning content they find in various formats (text, video, audio, graphics, etc.) as a practical guide of educational and digital resources for online learning to learn in various ways (synchronous and asynchronous, traditional or blended), by using different teaching methods and technologies, often setting goals, a time and a pace of learning of their own (anytime). It should be noted that online environments, both synchronous and asynchronous, can promote social development and collaboration skills, as well as personal relationships between participants*." (Grosseck and Crăciun, 2020)

Technology provides innovative and resilient solutions to combat disruption and help people to communicate and even work virtually without the need for face-to-face interaction. There are a lot of online tools available to create an effective and efficient environment and personalisation of learning can be encouraged through e-learning approaches. A combination of audio, video and text can help reach out to students. This helps create collaborative and

interactive learning, where students can give and get feedback, ask queries, and learn in an active way.

Combining face-to-face lectures with online modes gives rise to blended learning and opportunities for flipped classrooms. This type of learning environment can increase the learning potential of the students as they can learn anytime and anywhere, thereby developing new skills in the process leading to life-long learning.

E-learning does have certain weaknesses, as it can reduce the degree of communication between the learner and teacher, especially as direct communication and human touch are lost. Users can face many technical difficulties that hinder and slow-down the teaching–learning process (Favale et al., 2020). Time and location flexibility, though considered a strength of online learning, these aspects are fragile and they can create problems. Some students do not feel comfortable while learning online, leading to increased frustration and confusion.

Velicu (2021) suggests online education is risky, with issues such as the lack of control of the class, strangers reported at the online classes, cyberbullying and privacy issues. The online learning tools used need to be compatible with the design of the learning process. Students want two-way interaction which sometimes is difficult to implement online, so the learning process cannot reach its full potential. Sometimes, online content is all theoretical and does not let students practice and learn effectively. Poor course content was also a major issue. Students feel that there is a lack of community, technical problems, and difficulties in understanding the learning goals are the major barriers for online learning (Song et al., 2004). Students were found to be not sufficiently prepared for balancing their work, family, and social lives with their study lives in an online learning environment. They were poorly prepared concerning e-learning competencies.

Online learning generally provided a lot of opportunities during the outbreak of Corona Virus crisis (Favale et al., 2020). For example, Velicu (2021) showed that Romanian teachers realised that online teaching provided them with opportunities to develop a multimodal approach, but at the same time this was very challenging as education institutions could take the chance to embed online activities and enrich the classroom learning by encouraging their teachers to teach and students learn online. They felt learners were able to increase their opportunities as they were forced to try new modes of learning. There is a lot of scope for embedding online innovations and digital developments by designing various programs for problem-solving, critical thinking and adaptability among the students.

Online learning is challenging, with challenges for learners, educators, organisations and decision makers. A difficult task was put in front of governments and educational institutions who were forced to reduce face-to-face exposure between educators and learners but maintain the quality and integrity of individual curricula, and the quality of education overall. According to Bakator and Radosav (2020), the main issue was that the majority of educational institutions were not technically equipped, thus the employees (teachers, professors) use platforms which require the "least hassle". This approach is practical in the short-term, however in order to effectively and efficiently address issues, it is necessary to develop a more unified and considered approach.

It was a challenge for teachers to engage students online and help them participate in the teaching–learning process (Korkmaz and Toraman, 2020). It was also difficult for teachers to move learning from offline mode to online mode, changing their teaching approaches and managing their time. It was hard to develop content which not only covers the curriculum but also engages the students (Kebritchi et al., 2017). The teachers commented that there was no clear stipulation in their educational policies about e-learning tools and technologies and there remains a lack of standards for quality, quality control, the development of e-resources,

and e-content delivery (Cojocariu et al., 2014). Developing quality virtual courses takes time and considerable expertise (Affouneh et al., 2020). A lot of effort and costs are involved organising and running courses including getting the devices and equipment, maintaining equipment, training teachers to develop the online content.

The shift to digital technologies in education has raised concerns among educators regarding the heavy reliance on technological solutions. More precisely, ethical and moral concerns arise, as the face-to-face and traditional approach to teaching is tremendously hindered by the COVID-19 pandemic and the massive transition to online learning solutions (Kumar, 2020).

Ensuring digital equity is crucial. Not all the teachers and students have access to the digital devices they need, fast Internet and Wi-Fi. It is important that efforts are taken to ensure that every student and teacher has access to the resources they need. They must also ensure that educational apps work on mobile phones as well, in case students do not have laptops or tablets. Carey (2020) suggests that the greatest challenge is not about whether online teaching–learning methods can provide quality education, it was whether educational institutions would be able to adopt online learning in such a massive manner.

## 6. Responses to the crisis

In order to reduce the spread of COVID-19, most countries around the world decided to temporarily close educational institutions. Learning did not stop but where possible it took place online as schools attempted to provide remote schooling. This closure of schools that led to rapid responses to provide online learning for students resulting in the term 'Emergency Remote Teaching' (Hodges et al., 2020a). Most educational institutions cancelled in-person instruction and moved to remote learning and teaching in March 2020 in an attempt to contain the spread of COVID-19. Many parts of the formal education system did not re-open until 2021.

d'Orville (2020) highlighted the UNESCO-led Global Coalition for Education Initiative, which sought solutions to support learners and teachers, as well as governments throughout the recovery process with a principal focus on inclusion, equality and gender equality. The crisis was seen as an opportunity for stronger international collaboration which might provide a better focus and deliver solutions including digital tools. During this period a lot of students were affected disproportionally especially the most vulnerable and disadvantaged ones.

Students and educators began to use various online platforms for learning. This included the Zoom app, YouTube live, Team link, Google hangout, Skype, Google classroom etc. The learners used one or more of these applications for distributing, sharing and acquiring learning materials (Bakator and Radosav, 2020).

The challenge to educational institutions was not only finding new technology and using it but also reimagining its education, thereby helping students and academic staff who are seeking guidance for digital literacy. Teaching staff were encouraged to enable learning through online tools and identify and create support material to facilitate teaching and learning using online platforms. Teachers were forced to implement digital methods of teaching, delivering content to their students (Perienen, 2020).

Atchoarena (2020) commented that education was forced to change, but suggested that this led to some surprising innovations; such as the growth of public-private educational partnerships, but the digital divide could become more extreme if educational access is dictated by access to the latest technologies (Tam and El-Azar, 2020). Dobrilă (2020) suggested that in order to avoid disruption in learning, efforts should be intensified to support an active learning process when implementing online learning, with the purpose of providing quality education. It was important that teachers supported the educational process and contributed with open educational resources.

In Italy the Ministry of Education Note of March 2020 (562/2020) allocated 85 million euros to deal with the health emergency and allow state educational institutions to continue teaching through the dissemination of free to use digital tools for distance learning, to immediately equip schools with digital tools or encourage the use of e-learning platforms (Ranieri et al., 2020). However, not all educational institutions responded in the same way and with the same timeliness: much depended both on a lack of national guidelines and on individual school managers (Allodola, 2020). Schools appeared to do everything possible to start distance learning in order to ensure didactic continuity, even if necessarily virtual. The schools equipped with an electronic register were able to take advantage of the tools available within it, also activating virtual classrooms. At the same time, other platforms were activated (like G Suite for Education and channels on Youtube) to upload and share teaching materials (documents, videos, etc.). Furthermore, Allodola (ibid) highlighted that due to the pandemic a profound restructuring of teaching activities took place, with consequent impact on the psychological and pedagogical dimensions of teachers, students and parents.

On 6 April 2020 the Italian Ministry published a guide for teachers "Distance learning and students' rights. Mini-guide for teachers" (Pellegrini and Maltinti, 2020). The guide consisted

of six questions ranging from the digital divide to how to reassure pupils about the current condition, followed by suggestions for practical activities for teachers, such as proposing listening time, inviting children and young people to make proposals on the organization of teaching, proposing reflections on the new training experience to children and young people, according to age and degree of maturity, reflections on the new training experience, helping them to reflect on this, reassure children and young people informing them that aid from the state and schools was on its way.

Alevizou (2020) stated that she, like a lot of other teachers during the pandemic, experienced digital fatigue by constantly being required to be online and plugged in. She describes this fatigue as 'covid-gogy'. She said:

"*Teachers too have become overstretched with new shifts and routines, learning new tools and everyday online content creation, while they become increasingly anxious about the ways in which they can cater for the wellbeing of students and younger children online, especially those with special education and health needs. They even engage more in a kind of 'covid-gogy': juggling catering for the practical needs of vulnerable families, the emotional pragmatic needs of key workers' children at school, and, finally inspiring the children at home through online classes.*"

She suggested that the practicalities and pedagogies of 'distance' learning were very complex, especially when seeking to make the transition from conventional education to distance education. Moreover, she was concerned about the use of some AI-learning platforms for schools such as FlipGrid and Edmodo, that offered free access to their services, as this raised concerns not only about their pedagogical suitability but also ethical issues. She concluded that this discussion should be integrated in a wider conversation about the values that we want technology and digital media help to promote and what kind of literacies we want our young learners to have.

In China to ensure open accessible learning experiences, during COVID-19, for those who do not have Internet connection especially in remote areas, courses and assignments were provided via televisions (Huang et al, 2020). Four channels of China Education Television started open broadcasting of primary and middle school classes across the nation covering 75 lessons on air to provide open learning experiences for those in remote areas without Internet or without cable TV.

After the first lockdown, education organisations all over the world were developing strategies for the following school year. Some of these included social distancing measures, while others involved the rapid development and infrastructure implementation for online teaching. Some schools were opting to spread one school day over two days. Students attend three classes in the morning and have the afternoons to work independently and visit teachers during their 'office hours'. On day two they attend the rest of their classes online in the morning and then virtually meet with the teachers of those classes in the afternoons. Another option has been to reduce the number of subjects to one or two per day from five or six, as long as students are continuing to be on pace and are progressing. Along with this flexibility, consistency is also important for parents.

Using existing literature and evidence from recent international data (Eurostat, PISA, ICILS, PIRLS, TALIS), Di Pietro et al. (2020) attempted to gain a better understanding of how the COVID-19 crisis affected students' learning. Their research looked at the how measures adopted to contain the virus might impact on children's achievement. 'Conservative' estimates for a few selected EU countries consistently indicated that, on average, students would suffer a learning loss. It was confirmed that students would be negatively in terms of both their cognitive and non-cognitive skills acquisition, and it would have important long-term consequences in addition to the short-term ones.

"*…students have suddenly had to force themselves to take responsibility of their own learning although they get together with the educators trying to reach them through online platforms. As this way of learning may not be suitable for every student or not every digital platform may be reached by everyone throughout the world, it is quite reasonable to reckon that this process during COVID-19 may expose more challenges and we may have to tackle with more diverse and complex problems in the future*." (Korkmaz and Toraman, 2020: 294-5).

Nilsson (2021) analysed Swedish high school students' experience on distance education during the first wave of the Covid-19 crisis in the spring 2020 and evaluated to which extent crisis response can be implemented in crisis distance education. The preparation for using digital tools for education during Covid-19 in high schools in Sweden was good because the readiness for respondents to use digital tools in education was relatively high.

The pandemic magnified the 'digital divide' that widens inequalities among the 'haves' and the 'have nots' (Anderson, 2021). Giovannella et al. (2020b) confirmed, "The teaching strategies adopted by most teachers in this emergency are, in fact, very far from ideal solutions to maximize inclusiveness. For example, a more intensive use of asynchronous communication tools would have probably attenuated the exclusion effects pointed out by our data".

Özer and Suna (2020) discussed the effects on students of the transition to distance education and the potential increase in educational inequalities. Students from diverse socio-economic level had significant differences in opportunity to access distance education. Students with more technological equipment such as hardware and a stable internet and intellectual resources have comparatively higher academic performance. Another important factor that can be added here and created inequalities is the parents' level of education as those students, whose parents have higher levels of education were more supported by their families and their achievement level was comparatively higher.

Although the adoption of distance learning is key to ensure the continuity of education following the physical closure of schools, students were, on average, likely to experience a learning loss during the lockdown. Several arguments can be put forward to explain this. First, there is evidence showing that quarantined students tended to spend less time in learning compared to when schools were open. Second, many students confined at home due to COVID-19 may feel stressed and anxious, and this may negatively affect their ability to concentrate on schoolwork. Third, physical school closure and the lack of in-person contact may make students less externally motivated to engage in learning activities (Di Pietro et al., 2020).

Not only did COVID-19 and the move to remote learning and teaching cause greater inequality in cognitive abilities, but it also appeared to exert a similar effect with regard to students' emotional well-being and motivation. In fact, students' isolation from their friends and teachers may result in an unequal distribution of behavioural and psychological problems. During the lockdown, students from less advantaged backgrounds were more likely to be exposed to a stressful home environment (e.g. they are more likely to share a limited space and a limited number of digital devices with other family members). Furthermore, parents in these households, who may be under pressure because of financial and job security issues due to the COVID-19 crisis, are probably not in the best position to support their children in these circumstances.

Regarding teachers, worldwide an estimated 63 million teachers (UNESCO, 2020b) were compelled to leave their usual workplace and, with few institutional means, to use their own computers and Internet connections, without the necessary initial or in-service training to use the new technologies with solvency. These teachers felt obliged to cope with these completely new modalities of distance teaching-learning for which they have not had any training. Most

European regions used ministerial web platforms designed for the continuity of remote teaching, generally built-in response to the school closure caused by the COVID-19 crisis (Lorente et al., 2020).

In the USA, according to Williamson et al. (2021), school administrators and teachers attempted to shift their efforts to implement the use of virtual platforms for students, families, teachers and technology. Though some districts were creative in providing hotspots, they cited the main issues being a lack of broadband and too few devices at home for students to learn.

In Turkey, Mahmut (2020) described the development and use of a mobile app 'I am Special, I am at Home', to support special education students:

"*In cooperation with non-governmental institutions and foundations for disabled people, MoNE also prepared videos which focus on the self-care and fundamental skills of students. Additionally, for the students with diverse levels of autism, 19 educational programs have been updated. Lastly, a mobile application (I am SpeciaI, I am at Home) has been developed and it is now available for special education students*." (Mahmut, 2020: 1127-8).

The pandemic greatly challenged education leadership and decision making. Moreno and Gortazar (2020) undertook a survey of school principals and education leaders around the world, they found that universal access to learning platforms was within reach only for a few countries, including all the Nordic countries, Singapore, Qatar, and the four Chinese provinces participating in PISA 2018, and to a lesser extent Australia, New Zealand, Thailand and the United States. Most countries had around two-thirds of 15-year old students in schools whose principals think their teachers have the technical and pedagogical skills for digital learning. For most countries, between 45 and 80 percent of students are in schools whose principal considers that effective resources exist for teachers to use the digital devices available, with quite a few countries reaching 90 percent and higher.

In Romania, according to Velicu (2021), the 2020-2021 school year was marked by ad-hoc decisions guided mainly by the public health authorities through centralised approaches. In this context, schooling at a distance prevailed, which mostly took the form of synchronous online classes, delivered via a screen mediated environment. There was a lack of educational digital content and genuine digital pedagogies, few curriculum adjustments and an absence of profound, systemic and effective inclusive approaches for vulnerable students. A hybrid system was also tried, but despite its very promising opportunities, various issues in infrastructure made its implementation flawed. Some new practices were generated and a lot of emotion, both positive and negative, among teachers, students and parents. It also made more visible some old and latent problems of the system and offered solutions for some others.

König et al. (2020) stated,

"*In Germany …..The Standing Conference of the Ministers of Education and Cultural Affairs of the Länder (KMK [Standing Conference of the (State) Ministers for Education and Culture] 2017) recently published its strategy paper on 'education in the digital world', requiring schools to foster digital competences in their students across all subjects. Student competences are classified into areas that correspond with the European Digital Competence Framework …… Despite these goals (and the provision of structural funding to equip schools, such as the so-called 'Digital Pact' of the Federal Government and the Länder in Germany in 2020; GEW (Gewerkschaft Erziehung und Wissenschaft) critical discussion has emerged in relation to how digital technologies improve student learning in the classroom (e.g., BuabengAndoh 2012; Autorengruppe Bildungsberichterstattung 2020)."*

In Romania, Velicu (2020) interviewed representatives from education authorities, schools, parents and NGOs involved in education. The main issue discussed was inequality of access, understood as having access to a digital device and an internet connection. Some of the issues discussed included the lack of educational digital content and genuine digital pedagogies, lack of curriculum adjustments, lack of profound, systemic and effective inclusive approach for vulnerable students.

A hybrid system was tried, but despite its promise, various issues in infrastructure made its implementation impossible. The solution of hybrid education sought to avoid overcrowded classes by reducing the number of students who attend on site at the same time; it supposes that classes are split in two and, in rotation, half of the class goes to school and the other half participates in the classes remotely online. The teacher would teach to both groups simultaneously from the classroom, the minimal equipment required being a webcam and a microphone. Another issue was the differences in digital literacy between students. Those with lower levels could not participate in distance education (Özer and Suna, 2020).

Pollock (2020) focused on how the school leaders managed the crisis. Principals were required to expand their leadership skills in the virtual space, managing a virtual school, which they were not necessarily prepared for. Covid also forced them not just to ensure the health and safety of students, but also to develop a comprehensive understanding of COVID-19, including causes, symptoms, public health protocols, and preventions. They also had to sort and filter information to find the most up-to-date and accurate data as new details about the disease are discovered rapidly. In addition, principals had to consider the emotional and social well-being of their students and ensure that effective pedagogical practices and successful student learning took place. Leaders' own well-being through the pandemic should also be considered.

"*How the stress of leading and managing schools through a pandemic will influence principals' wellness remains to be seen, but chances are the consequences of school closures and reopening—and, in some cases, re-closure—will do little to ease work intensification or principals' stress and burnout*."

For students with disabilities virtual learning may be particularly unsettling. Yazcayir and Gurgur (2021) examined how special needs education was provided for students at home during the pandemic in Turkey. Their research showed that students with special needs were encouraged to continue their schooling via distance education provided by Turkish Ministry of National Education through EBA TV and the official Ministry website. Several issues of concern were noted as students with special needs could not regularly follow the lessons on TV, so many of them did not attend online lessons, and their teachers did not get feedback about their activities. None of the students with special needs received additional support from education services, and there was no communication and cooperation among teachers, families, and students. The findings indicated that in general, children were unwilling and unable to adapt to distance education.

### 6.1 Crisis Planning

In the literature, the impact of the pandemic has been compared with crisis and trauma planning. Hodges et al. (2020a) suggests:

"*During COVID-19, families are facing lack of socialization, technology equity barriers, digital citizenship/online safety concerns, internet capacity issues, unemployment, loss of family members, food shortages, essential employment, and other concerns, contributing to toxic stress and trauma in students' environments …… Trauma is an emotional response to a traumatic event* ".

Students had been experiencing trauma in the form of an upheaval to their daily lives and routines, they are grappling with or struggling to comprehend that their 'world' will not return to normal in the near future; and responding to the havoc upon 'normal' societal functions. According to Werner (2014) the more involved school counsellors were in the crisis planning process, the more prepared the schools, teachers and students will feel.

Teachers need to recognize the different levels of support and instruction occurring in homes and that they need to adapt to aid and support families during distance learning. Hodges et al. (2020b) discuss how the creation of education-family partnerships can be used to mitigate the impact of trauma, augment digital learning and provide support for a variety of instructional scenarios happening in homes (Figure 4). These partnerships emphasised trauma-informed and social emotional learning support that responds to the psychiatric and mental needs of families by providing evidence-based, trauma-informed social emotional support for learning in home settings.

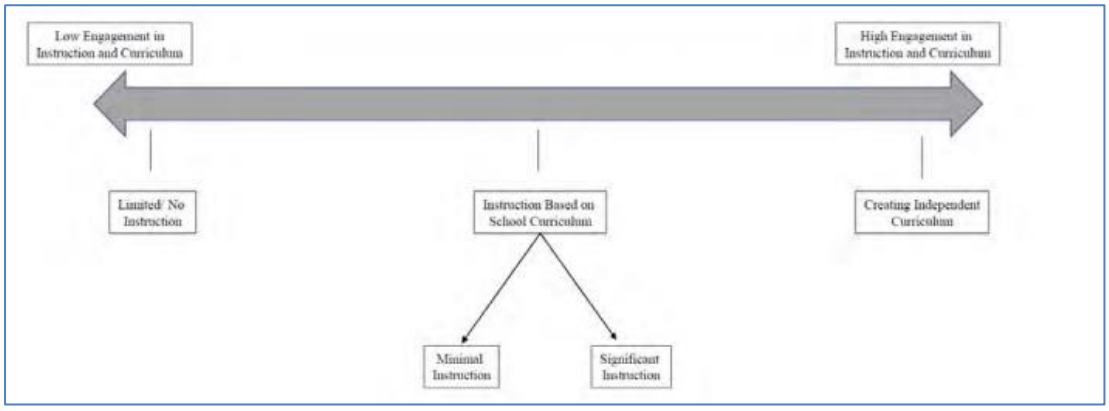


Figure 4: Types of distance learning (Hodges et al., 2020a)

The education - family partnerships were able to creatively collaborate via social media, for instance the Parenting During a Pandemic (PDP) group was a private Facebook group open to all families nationally and internationally that provides best support to families during the school closure during COVID-19 pandemic.

### 6.2 Policy and Training Frameworks

The effect of COVID-19 on education poses at least two key challenges for policymakers. First, measures should be taken to ensure that more vulnerable students will be able to make up for the learning loss they experienced during the lockdown. This should be done quickly and effectively, in order to avoid that such crisis results in permanent education and economic inequality. Second, given that there is the possibility that educational institutions may not be able to operate fully in-person during parts of (or the whole) next academic year, alternative methods of delivering teaching and learning should be put in place. Although a blended /rotating learning system (with offline and online elements) is an interesting option, it is important to note that: 1) it requires a change in both the quantity and quality of the teaching capacity, 2) it requires a revision in the curriculum, 3) younger children may have problems in adapting to this model especially for the online learning part, and 4) the structure of many existing school buildings may not be appropriate if one wants to maintain physical distancing.

Kilcoyne (2021) explored how the Ireland's national digital technology in education policy (The Digital Strategy for Schools Policy 2015–2020) and its enactment in schools prepared them for school closures as part of the Covid-19 response. The educational, economic and social context in which the digital strategy for schools was published in 2015 was vastly different from the living with Covid-19 context. When schools eventually recalibrated their approach to lockdown induced school closures will have provided a collective perspective and richer

evidence base for the student, teacher, parent roles to contribute to the technology in the education debate.

The Irish Framework provided a government action plan for the integration of ICT into teaching, learning and assessment practices. The strategy was developed around four themes, Teaching, Learning and Assessment using ICT, Teacher Professional Learning, Leadership, Research and Policy and ICT Infrastructure.

In Ireland, while there is mention of diversity and inclusion in the strategy, ICT plays an important role in supporting inclusion and diversity for all learners by enhancing learning opportunities for all students in the strategy (DES 2015, 8). Researching Irish schools with high concentrations of students from socio-economically disadvantaged backgrounds, Bray et al. (2020) found that students in these schools were three times more likely than their peers to have low online engagement during the school closure period. They confirmed that parents of children with a disability and those in the older primary classes were more likely to report their child was no longer learning.

In terms of policy management and leadership, the Irish strategy recognised 'a need for distributed leadership in order to truly integrate ICT across our education system' (DES 2015, 7). In observing the Covid-19 response, Berry et al. (2020) stated that the fact that there was no rulebook for how to deal with this crisis has helped scale a concept in the education space that other professions have known for some time: authentic leadership emerges from collective action and good ideas, not just positional authority. Netolicky (2020) says teachers and school leaders have been engaging in deep job-embedded learning, trying, iterating and refining practice as they go. In the eye of this educational storm, teachers have moved with fidelity through the various identities of classroom pedagogue, pandemic pedagogue and online pedagogue.

According to Korkmaz and Toraman (2020) distance/online learning is mainly based on connectivism that strives to remove barriers to learning and encourage equal opportunities. The notion of school and learning that is solely focused and conducted in a physical place has been irreversibly disrupted, with the Covid-19 experience illustrating that technologies theoretically allow for 'anytime-anywhere' learning to occur (Scully et al. 2021). Classroom space–time has travelled in the other direction, into the home environment, introducing the polysynchronous world of learning in the digital age into the rhythms of family life, what might be called the Bring Your Own School Home (BYOSH) movement (Williamson et al., 2020).

Kearney et al. (2012) proposed a framework when using mobile devices (e.g. smart phones, tablets and laptops) for learning which provides three pedagogical characteristics that influence learners' experiences when using such devices: personalisation, authenticity and collaboration. Personalisation refers to learners accessing customised activities which can lead to a sense of ownership and to control over the time, place and pace at which they learn. Authenticity provides opportunities for contextualised, situated learning and through the use of digital devices students can generate asks involving participation in real-life practices and/or highly relevant learning activities. Collaboration is the conversational and connected aspects of online learning as technology allows a 'high level of networking' (p. 10). Collaboration also refers to sharing and accessing an array of content, artefacts and information. These concepts are underpinned using time and space, because the usual constraints of time and space are transcended as learning through devices is no longer bound in physical spaces and timetables.

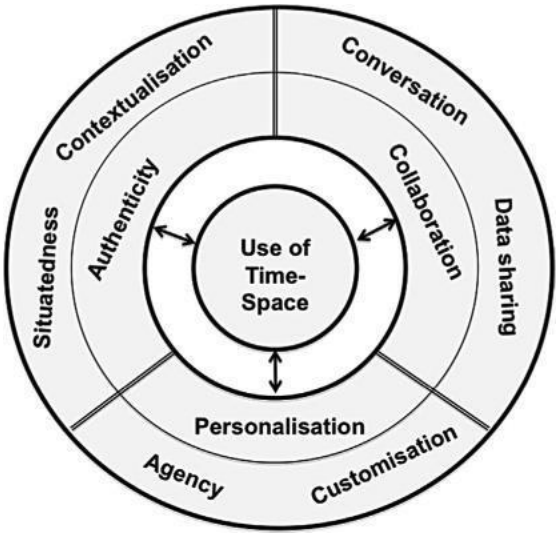


Figure 5: Framework comprising three distinctive characteristics of mobile learning experiences (Kearney et al., 2012: 8)

Kearney et al.'s (2012) framework is grounded in a socio-cultural perspective which 'suggests that learning is affected and modified by the tools used for learning'. The framework provides a lens to analyse pedagogical approaches, teaching and learning activities and learning materials when using digital devices for learning in schools. It was not designed for distance learning so literature from the distance education field needs to be considered as participants were forced into learning at a distance. Constructs in the framework (ibid) were reflected in participants' experience of learning, but motivation and pedagogical approaches were also important aspects of this experience. In light of these additional aspects the framework has been adapted by Yates et al. (2021) to reflect participants' experience of emergency online learning at home (Figure 6).

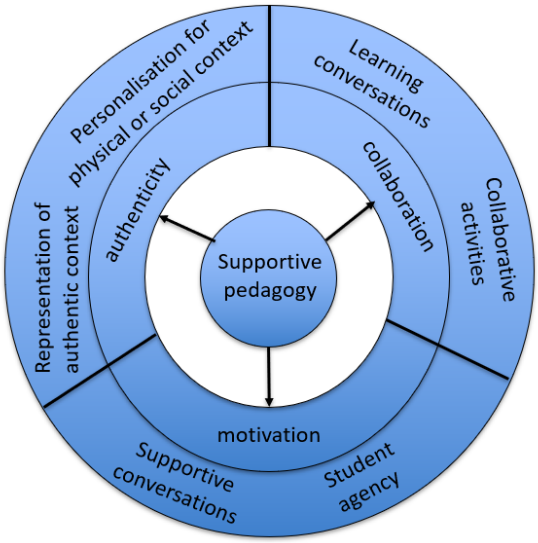


Figure 6. Technology mediated supportive pedagogy for emergency context learning at home (Yates et al., 2021)

Yates et al. (2021) applied the Kearney et al. (2012) framework as a lens to examine student experience of digital learning at home in New Zealand high schools during Covid-19. This framework provides the three characteristics of personalisation, authenticity and collaboration that influence learners' experience when using digital devices for learning. This study found these aspects were reflected in participant experiences and identified further important characteristics that influenced learning. Authenticity and collaboration facilitated learning, but participants valued supportive pedagogies and motivational strategies which enabled academic progress and enhanced wellbeing. Effective use of technology mediated

supportive pedagogies and an alternative framework was developed to incorporate these additional findings.

### 6.3 Technology adoption

Wohlfart et al. (2021) analysed the factors that influence teachers' acceptance of digital tools to adopt distance teaching during the Covid-19 pandemic. They carried out semi-structured interviews with a small regional sample of secondary school teachers. The results showed that apart from motivation three elements influenced the adoption of digital tools i.e. 'regulations and specifications', 'technological infrastructure' and 'heterogeneity of students and teachers'. The Covid-19 pandemic forced teachers to adopt digital tools, it had a positive impact on their perception and they noted its immediate usefulness. They highlighted the positive motivation of users and there was evidence to suggest that PEOU (perceived-ease-of-use) was a factor that affects not only teachers' acceptance of tools but also their usage.

Tandon (2020) reviewed the factors influencing adoption of online teaching by school teachers and proposed a model of adoption (Figure 7). The findings suggest that the expectancy of good performance perceived by school teachers can build positive attitudes as well as drive their behavioural intention to adopt online teaching during a pandemic outbreak. Conditions facilitating technology use had a significant and positive impact on the intentions of teachers as well as increasing positive attitudes. In-house training programmes and proper equipment helps in the familiarization of teachers thereby facilitating their adoption. The social influence of peers however had a negative influence on teacher attitudes to adopt online teaching.

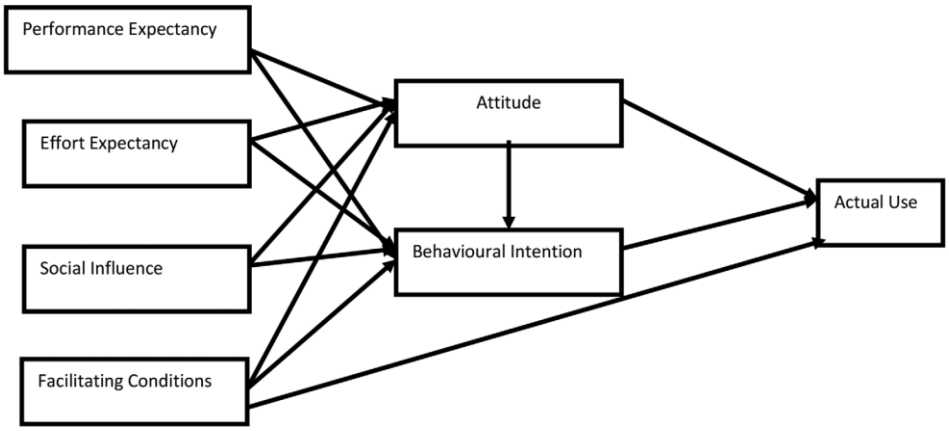


Figure 7: Model representing technology adoption (Tandon, 2020)

The research indicates that teachers need to be trained about the benefits and usefulness of online teaching. Those teachers who do not understand the usefulness of the technology will be unable to successfully adopt it. Those teachers who are already conducting classes online are able to convince their colleagues to adopt online teaching. Teachers were more likely to adopt in schools where infrastructural support is well established to facilitate online teaching. Regular support and organized training sessions for teachers by the school administration were enabling conditions. School authorities also need to instil a positive feeling among teachers about the usefulness of online teaching. Finally there was a very strong relationship between intentions and actual use suggests that an "intention-behaviour gap" was unlikely to exist because teachers were forced by the pandemic conditions to work online.

Teaching professionalism has been cited as a factor affecting technology adoption. A model developed by Seidel and Stürmer (2014) indicates the professional vision as a qualifying element for the competent teacher. According to this model (Figure 8), the professional vision is structured in two dimensions, noticing and reasoning.

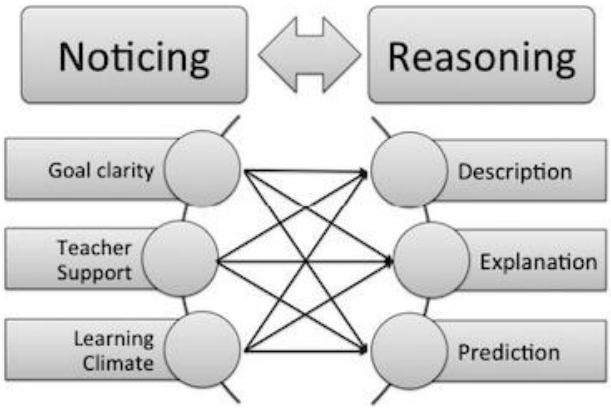


Figure 8. Model of professional vision. (Seidel and Stürmer, 2014)

Toto et al (2021) investigated the professional perceptions of teachers in terms of their skills and resistance towards digital technologies. In the relationship between teachers and distance learning in the context of COIVD-19, a series of unprecedented dynamics existed that allowed a process of experimentation to emerge. They make references to the professional vision model of Seidel and Stürmer (2014) suggesting that the process where the noticing phase directs towards the objectives requires a clarification of the teaching goals leading to reflection on professional use of digital technologies in teaching and also to their vision of teaching.

As a result of a survey of early career teachers, König et al (2020) assessed whether the teachers surveyed were able to maintain contact with their pupils and its extent and whether core teaching challenges could be completed. The research analysed possible factors concerning these results, including the technology available in school, teacher competence and professional development opportunities for teachers to improve their digital teaching and learning). Their research showed that the availability of ICT tools, the level of digital teacher competence and the opportunities for teacher professional development were instrumental in helping teachers to adapt to online teaching during the early school closures under the pandemic.

Arora et al. (2020) attempted to examine the factors affecting the adoption of online learning. They discussed the challenges associated with the adoption of digital education from the student point of view and specifically address limitations related to socio-economic factors, technology and its adoption, digital competences, compatibility and supervision. The results demonstrate that three major factors affected online learning during the COVID-19 pandemic, the availability of technology, infrastructure and training for teachers and students, as many teachers or instructors were not ready for remotely delivering high-quality education. Several hurdles slowed down the adoption of digital teaching, such as a lack of experience on the part of teachers, legal framework conditions at various levels and education policy (Benning et al., 2020), a lack of transparency in the credibility of digital teaching and other aspects ensured that digital teaching could only develop step by step (Müller, 2018).

According to Giovannella et al. (2020a)**,**

"*Our educational institutions and their teaching staff will be readier than ever to move to online or blended learning once and for all. In any case, such a dramatic emergency can be regarded as a catalyst for change and an opportunity to reflect on the nature of the educational ecosystems (places, processes, contents, competences, etc.)*".

Zimmermann (2020) considered that the use of online learning during the pandemic has generated over-optimistic expectations. Hodges (2020a) suggested:

*“the temptation to compare online learning to face-to-face instruction in these circumstances has brought about negative considerations along the lines that online learning is no substitute for the ‘real thing’.”*

# 7. Case Studies

The case study analysis '*Digital Technologies in School Education: from the European vision to the school governance*' addresses schools, at the organization level, who have been encouraged to examine their micro-policies related to the way in which they have' translated into practice' the digital challenge through the promotion of digital resources in teaching activities (online and/or blended); teachers' professional development on digital transformation; e-learning quality standards; online/blended school policies.

The 5 case studies involve Italy, Romania, Poland, Spain, Greece, Cyprus.

### 7.1 Italy: Liceo Statale "Ettore Majorana" – Rho

**i. School details**:

Liceo Statale "Ettore Majorana" (http://www.liceomajoranarho.edu.it) is a secondary school founded in 1967/1968. There are 41 classes and about 859 students aged 14 -18, teachers are 82: 59 with permanent contract and 23 with a temporary one and 23 staff members. The school leads to the Esame di Stato (diploma from Italian Secondary school qualifying for university admission or matriculation).

**ii. Methodology**:

The information for the case study was gathered through interviews collected in Department meetings and in each class after a discussion guided by a class coordinator teacher.

**iii. School ICT Policy**

**PNSD (Piano Nazionale Scuola Digitale) in our School Offer Plan**

In September 2018, the Google Suite environment was introduced in the school:

- insertion and management of users
- creation of groups of teachers based on the organization chart: group of all teachers, groups of teachers per board by class, by department, by commissions and more;
- creation of groups of students per class, with their respective coordinating teachers, and of a group containing everyone students and class coordinators;
- reorganization of the Team Drive, in line with the new structure of classes and teachers;
- preparation of instructional documents for teachers, in particular a short handbook for the first access to the platform, distributed to all first grades and to be delivered to each new school employee;
- introduction of Google Calendar for all teachers and ATA staff and configuration on devices (PC, mobile phones);
- creation of the Google Form for filling out the work plans and the user manual, sent to all teachers; support for teachers in filling in the form and archiving the generated file.

Thanks to Google Suite many teachers have become more skilled in using the PC. Many of them share information through the platform, on Projects, on students in difficulty, on classes, easily using the names of the groups that automatically collect the addresses of the people involved.

Teachers learned to use the Drive environment for their materials and the Team Drive. A good number of teachers now use Classroom and Forms for teaching. But the coronavirus pandemic had and is still having an unprecedented impact on education, with students, teachers, and parents at home and abroad facing not only tremendous levels of pressure but also, opportunities to overcome the challenges together.

Last year in February (2020), suddenly, unexpectedly, we were thrown into a new, dramatic, unusual reality. The school has not reopened and that little world in the world, that place aimed at providing students with the necessary tools to grow culturally, psychologically, and socially and to acquire a certain degree of responsibility and autonomy, had to be reinvented. But it did not interrupt schooling. We did not stop at the Liceo Majorana, teachers and students immediately rolled up their sleeves and we put our effort into continuity of the educational offer even if at a distance.

The teachers were able to get organized since the first days of closure, thanks to work practices already consolidated on e-learning platforms, with lessons, exercises, notes and assigning tasks.

Various tools were used: virtual classrooms, meeting tools, podcasts, videos. Space and time were dedicated to all.

Those students, who struggled with the shift to online learning, were in particular those with special educational needs, fragile or those from poorer backgrounds, some of them lacking in IT equipment and software or poor / no reliable internet connection. Education had to focus on knowledge and not on evaluation. This meant an adaptation of the program and the adoption of different methods.

Each teacher used and made use of the system, the method, the tools that he / she considered to be the best vehicles of his knowledge, considering that in any case, we all used our personal resources, our computers, our own internet connections. For everyone it was a test of professionalism and adaptation.

At the beginning of the new School Year, the school issued a DDI (Integrated Digital Didactics) Plan. In this Plan there were guidelines that regulate and define the methods of implementation of digital teaching, both in the situation in which digital is integrated with that face-to-face, and in the case where the conditions force only online teaching.

Homogeneity of the educational offer - The Teachers Board, through this Plan, sets criteria and how to deliver the DDI, adapting the planning of educational and teaching activities in presence in the remote mode, also in complementary mode, so that the didactic proposal of the individual teacher fits into a shared pedagogical and methodological framework.

Attention to the most fragile pupils - The Class Councils, in agreement with the families, define the teaching proposal more suitable for students with disabilities or those who present fragility in the conditions emotional, socio-cultural or health, appropriately attested and recognized, endorsing their school attendance in the presence, but only in agreement with the families and in the interest of the students.

Prompt information, respecting privacy – Liceo Majorana provides families with timely information on the contents of this Plan and will always act in compliance with the regulations concerning personal data protection, collecting only strictly relevant personal data e linked to the purposes to be pursued.

**Projects/initiatives**

Liceo Majorana has defined its own school innovation strategy which includes intervention plans to pursue the following objectives, which have already been partially achieved:

1. strengthening of network infrastructures
2. strengthening of the didactic and laboratory tools necessary to improve training and innovation processes
3. creation of innovative learning environments
4. development of students' digital skills
5. innovation of teaching skills

6. preparation of a school portal
7. network access control and content protection available to users
8. training of administrative and technical staff for digital innovation

The school uses the Google Suite platform, the school communication and educational documentation management system. This provides in particular a documentary organization of the didactic activities through specific archives for class councils, departments, commissions. A series of applications and software such as Google Forms, Classroom, Google Drive are also in use. The platform is in use not only among teachers and secretarial staff, but also between teachers and students (Classroom) and soon Google Suite will also be integrated into *PCTO* (Educational curricula for transversal skills and orientation) activities, being a tool also used in companies.

Our school, through the opportunities offered by the European Social Fund (ESF), already has two mobile laboratories to increase the active teaching of the Liceo Linguistico. The flexibility of these tools also allows them to be used in the classroom for non-linguistic subjects and this allows the transformation of a traditional classroom into a multimedia space. The further increase in the number of mobile laboratories is therefore being defined.

Thanks to the “Digital Cafés” afternoon training sessions, teachers were able to learn the use of some applications useful in teaching and helped those teachers who are not used to using technology to become more independent. The Argo Gecodoc system is also active for registration and digital signature to dematerialize documents.

The need to dematerialize the acts of Class Councils leads to offer the opportunity for each teacher to have a digital signature, through a formal digital profile. Due to the emergency of pandemic and consequences of lockdown, as a school this year we issued Piano della Didattica a Distanza (Distance Learning Plan) DDI Plan.

**Reference regulatory framework**

The health emergency led to the adoption of regulatory measures that recognized the possibility of carrying out the educational activities of schools of all levels "at a distance "throughout the national territory (decree-law 25 March 2020, n. 19, article 1, paragraph 2, letter p).

The Departmental Note 17 March 2020, n. 388, bearing “Health emergency from new Coronavirus. First operational indications for distance learning activities "had already offered the educational institutions the operational didactic reference framework.

The decree-law 8 April 2020, n. 22, converted, with amendments, with Law 6 June 2020, n. 41, article 2, paragraph 3, establishes that the teaching staff ensures the teaching services in remote modalities, using available IT or technological tools, and therefore integrates the obligation, previously in force only for school managers pursuant to the decree of the President of the Council of Ministers 4 March 2020, article 1, paragraph 1, letter g), to "activate" distance learning, an obligation concerning, in the case of the manager, mostly obligations relating to the organization of delivery times, technological tools, aid to overcome the difficulties of families and teachers lacking sufficient connectivity. With reference, specifically, to the methods and criteria on the basis of which to provide the work services and obligations by the teaching staff, up to the persistence of the state of emergency, please refer to the provisions of paragraph 3-ter of the same Legislative Decree 22 / 2020.

The decree-law of 19 May 2020, n. 34 funded further interventions useful for enhancing teaching, even at a distance, and to equip schools and students with the tools necessary for the use of teaching methods compatible with the emergency, as well as to promote school inclusion and to adopt measures that contrast the dispersion.

The decree of the Minister of Education June 26, 2020, n. 39 provided a reference framework within which to plan the resumption of school activities in September, with reference, for the topic in question, to the need for schools to adopt a School Plan for integrated digital teaching.

The Guidelines (Annex A to the aforementioned decree) have provided indications for the design of the school plan for integrated digital teaching (DDI) that Liceo "Ettore Majorana "intends to adopt.

We have been facing challenges to education arising from the impact of the information society, internationalisation, scientific and technological world. The transformation of society has called for an inevitable change in the structures for, and approaches to, teaching and learning with the need to outline the new roles of the teacher.

**Blended Teaching (*DDI Didattica Digitale Integrata*) School Plan 2020/2021**

**Aims and Objectives**

The DDI Plan aims to regulate and define the methods of implementation of digital teaching, both in the event that it is integrated with that in the presence, and in the event that the contingent epidemiological conditions require its exclusive use.

**Homogeneity of the educational offer -** The Board of Teachers, through this Plan, establishes the criteria and methods to regulate DDI, adapting the planning of the educational and teaching activities in presence to the remote mode, also in complementary mode, so that teaching proposals of any teachers fit into a shared pedagogical and methodological framework.

**Attention to the most fragile pupils -** The Class Councils, in agreement with families, will define the teaching proposal most suitable for students with disabilities or who present fragility in emotional, socio-cultural or health conditions, appropriately certified and recognized, favouring school attendance in presence, but only in agreement with the families and in the interest of the pupils.

**Timely information, in respect of privacy** - The Institute will provide families with timely information on the contents of this Plan and will always act in compliance with the regulations on the protection of personal data, collecting only personal data strictly relevant and related to the purposes to be pursued.

**Integrated Digital Activities**

As required by the Guidelines, the methods of implementation of the DDI will aim at a well-balanced choice between the following synchronous and asynchronous activities.

They are to be considered synchronous activities, i.e. carried out with real-time interaction between teachers and the group of students:

- live video lessons, intended as interactive audio-video communication sessions in real time, including the oral verification of learning;
- carrying out tasks such as creating digital documents or answering multiple tests or less structured with real-time monitoring by the teacher, for example using applications such as Google Forms;

Asynchronous activities are considered, i.e. carried out without real-time interaction between teachers and the group of students and with the help of digital tools:

- individual or group study activities with the help of educational material provided or recommended by the teacher;
- video lessons/lectures, documentaries or other prepared video material suggested by the teacher;

- practice exercises, problem solving, production of written or digital reports and assignments.

It is therefore specified that the normal activity of independent study of the disciplinary contents or the execution of tasks is not part of asynchronous activities, meant as structured and documentable teaching-learning activities, consisting of autonomous performance by students of precise daily /weekly assignments or diversified for small groups.

Online learning units can also be done in mixed mode, i.e. alternating moments of synchronous teaching with moments of asynchronous teaching also within the same lesson.

**Activity Schedule**

Integrated digital education consists of two modes:

- mixed teaching (blended), activated alongside normal face-to-face lessons, for the purpose to guarantee the social distancing necessary to reduce epidemiological risks;
- distance learning only, in emergency situations that make physical access to the school impossible.

**Mixed Educational Delivery**

Mixed teaching involves the division of the class into two groups: one connected online and the other in presence. The two groups alternate weekly, in this way the opportunity to participate in face-to-face lessons will be guaranteed to everyone. The relevant class councils will be in charge of modifying the composition of the single groups periodically, in order to foster socialization and interaction of students.

The class councils will possibly also identify students with special needs or specific requirements who will regularly attend face-to-face lessons or will follow remotely. Face-to-face lessons will follow the timetable provided to families at the beginning of the school year. Face-to-face lessons will follow the timetable provided to families at the beginning of the school year. Online lessons, simultaneous with those in the presence, will last 50 minutes, to allow an appropriate detachment from the use of electronic tools. Remote activities can be implemented in synchronous or asynchronous mode.

**On-line Learning**

In case of impossibility of providing educational activities in presence, to guarantee it carrying out at least twenty hours of didactic activity in synchronous mode with the entire class group, the individual class councils will organize an appropriate timetable, ensuring:

- compliance with the timetable in force at the time of the suspension of teaching activities in presence and of the same timetable of the lessons;
- for each discipline, a weekly number of hours as much as possible proportional to the curricular timetable (within two weeks for each subject, at least one hour lesson in synchronous mode lesson will be guaranteed);
- adequate moments of suspension of the synchronous activity in respect of the health of students and teachers, to *allow* an appropriate detachment from the use of electronic tools.

**Tools**

For the DDI the following tools will be mainly used:

- the Google Suite for Education platform with its various applications: Classroom, Meet, Sites, Modules, Documents
- institutional email (with domain liceomajoranarho.edu.it)
- Website: liceomajoranarho.edu.it
- the *Classevi*va electronic register of the Spaggiari Group

- digital books and multimedia materials already provided by publishing houses to accompany the textbooks

**Methods**

The main methodologies to be used in carrying out the DDI are the following:

- frontal lesson
- interactive lesson
- debate
- flipped classroom
- laboratory teaching
- inquiry-based Learning
- cooperative learning

**Needs analysis**

The Institute provides for a survey of the need for technological instrumentation in order to provide for the free loan of the tools for connecting to pupils who do not have the opportunity to use proprietary devices. Once the results have been analysed, the school council will approve the criteria for granting them on loan for use, giving priority to less well-off students. These criteria will in any case be transparent, always in compliance with the regulations on the protection of personal data. If devices are available and the needs expressed by the students have been completely satisfied, a device can also be assigned to teachers with fixed-term contracts.

**Students with Special Educational Needs**

The 2020 School Plan, attached to Ministerial Decree 39/2020, provides that the central administration, the regions, local authorities and schools, each according to their own level of competence, operate to ensure school attendance in the presence of pupils with disabilities with the involvement of support figures. For these pupils the reference point remains the Individualised Education Plan. Particular attention should be paid to the presence of pupils in possession of a diagnosis issued pursuant to law 170/2010 and pupils who are not certified, but recognized by the Class Council, with Special Educational Needs.

In fact, for these students, teachers must ensure that all 82 compensatory and dispensatory instruments provided for by the respective Personalised Didactic Plans are respected and guaranteed both in presence and at a distance.

Based on the specific needs of individual students with SEN, the Class Council will be able to give them the opportunity to always follow the lessons in person, if they are held. For pupils admitted to hospitals or treated at their homes, the Class Council, together with the headmaster, will evaluate the possibility of allowing the attendance of lessons only remotely. In this way, in addition to guaranteeing the right to education, the state of social isolation can be mitigated, making it possible to create a daily school life and relationships between peers. The teachers for the support activities contribute to the development of the learning units of the class, taking care of the interaction between the teacher and the students, both in the presence and through the DDI, also developing individualised material to be used by the student with disabilities, in accordance with the provisions of the Individualised Education Plan. It is specified that all BES students will have guaranteed teaching activity as per current legislation.

**Assessment: methods and tools**

Distance teaching requires a partial rethinking of the types of tests to be submitted to students. Not all tests used in the classroom can in fact be repeated without adaptations in distance learning. At the same time, it is important to try to propose forms of verification and evaluation as similar as possible to the ordinary ones, so as not to put pupils in difficulty with tests that are unfamiliar to them.

Under the Integrated Digital Education regime, it is therefore decided to use the following types of tests:

• Written, graphic and practical tests
• Oral tests
• Structured or semi-structured tests
• Personal interventions during the lessons
• Review of homework and / or assignments
• Group work
• Competence tests

The tests identified may contribute both to formative and summative assessments. In the case of mixed teaching, the tests that will contribute to summative evaluations will be proposed only in presence. In particular, the written checks, for social distancing needs, will be carried out in two subsequent weeks based on the subdivisions established by the SarsCov2 Safety Protocol of the Liceo Majorana. The tests proposed to the two class groups will be different, but with the same objectives / topics communicated in advance to the class. As far as organization allows, an attempt will be made to alternate the order of the groups for the performance of the tests.

In the event of a prolonged closure of the school (i.e. more than two weeks), summative assessment will be carried out only through the most appropriate types of tests suitable for distance learning and multimedia tools. In particular, in the case of tests carried out exclusively in DAD, if the teacher deems it appropriate, oral tests may possibly be used to replace the written ones, and other structured or semi-structured tests, also written with the applications provided by Google Suite (eg . Google Forms, or Google Docs). The possibility of administering through the digital channel also the types of evidence identified for the DDI remains valid.

The tests identified may contribute to both formative and summative assessments.

In the case of mixed teaching, the tests that will contribute to summative evaluations will be proposed only in presence. In particular, the written checks, for social distancing needs, will be carried out in two subsequent weeks based on the subdivisions established by the Sars-CoV-2 Security Protocol of Liceo Majorana. The tests proposed in the two rounds will be different, but aimed at verifying the same objectives / topics that will be communicated in advance to the class.

**Assessment**

The current legislation assigns the assessment function to teachers, with reference to the criteria approved by the Teaching Body and included in the Three-Year Plan of the Educational Offer. The evaluation

- must be constant, guarantee transparency and timely;
- ensure continuous feedback to adapt the teaching / learning process.
- be formative, that is, considering the quality of the processes activated, the willingness to learn, to work in a team, autonomy, personal and social responsibility and the self-assessment process.

The summative assessment is carried out using grids, elaborated within the different departments of Teaching Body (and reported in the Three-Year Plan of the Educational Offer), based on the acquisition of knowledge and skills identified as specific objectives of learning as well as the development of disciplinary and personal skills.

Formative evaluation considers the quality of the processes activated, the willingness to learn and work in a team, autonomy, personal and social responsibility, and the self-evaluation process. It will be necessary to intensify the formative assessment in the event of total closure of the Institute, so as to guarantee each individual student adequate feedback on their learning process.

For the periodic conclusive assessments, the results achieved in the presence and, in the case of prolonged closures, also the activities monitored online will be considered as elements for formative assessment.

**Rules of conduct**

Considering the ethical-legal implications posed by the use of new technologies and the network, the Liceo Majorana defines the rules of conduct to be followed during the connections by students, relating to the presence at lessons and the use of technology, to the protection of personal data and respect for the other. Students must punctually attend lessons in both face-to-face teaching and DAD, according to the scan provided by the Institute. Students belonging to the group that must attend the school cannot participate in lessons in DAD unless previously authorized by the Presidency / Vice-Presidency following adequately documented reasons, such as:

- mandatory quarantine
- covid positivity
- fiduciary isolation
- pathologies or situations that require staying at home for more than 7 days, with a doctor's declaration. The families of students who find themselves in such conditions must promptly contact the Presidency or Vice-Presidency offices who will take care to communicate the decision to the teachers of the Class Council.

Both in case of prolonged absence and in case of absence of a few days, both in face-to-face teaching and in DAD, students are required to justify the absence and to produce any self-certification (see Sars-CoV-2 safety protocol published on the website of the school on 09/26/20, https://www.liceomajoranarho.edu.it/protocollo-sicurezza-sars-cov-2/).

The justification for illness accompanied by self-certification must be made for the first day of returning to class; starting from the second day without any self-certification being sent, the student will be removed from the classroom and readmitted only after the family has sent it.

The justification must be made through an electronic register, the self-certification must instead be sent to the mailbox specifically activated: autocertificazioni.malattia@liceomajoranarho.edu.it (see circ. 32).

Lessons start for all students at 8.10 am; delays in lessons, both in face-to-face teaching and in DAD, will be suitably justified by means of an electronic register. Late students from 8.10 to 8.20 will be accepted in class by the teacher of the first hour who will indicate the delay on the electronic register.

Late students, from 8.20 am to 8.30 am, must request authorisation from the vice president (directly at the afore mentioned office if in face-to-face teaching or via email if in DAD) who will notify the teachers of the authorization to enter the class by the student on the electronic register.

After 8.30, students (both in attendance and in DAD) who will no longer be admitted to the current lesson and will have to arrive at the next hour. The regulation of postponed entries and early exits, for students who follow at a distance, remains unchanged with respect to that envisaged for face-to-face teaching, therefore admission to class (face-to-face or remote) is allowed no later than 10 am: 00; the exit is allowed no earlier than one hour after the end of the lessons, i.e. at 12.10 for students who have lessons until 1.10 pm, and 1.10 pm for students who have lessons until 2.10 pm. In different cases, the exit is not allowed and, if not present, students will be considered absent for the whole morning. If in DAD the absence of a student occurs even for just one hour and in the case of technical problems, the student's family is required to justify the hourly absence.

It is considered appropriate to remember that the attendance to lessons, both face-to-face and remotely, requires the active participation or the implementation of the same attitudes and actions by the students envisaged by traditional teaching; for this reason, mere listening to the 85 lessons cannot be considered attendance at them nor is participation in remote lessons from places that do not suit the nature of the teaching activity or that involve non-compliance with the privacy protection rules considered adequate .

Concerning the specific use of technology, students undertake

- not to share their platform access credentials with others;
- to report immediately the inability to access their account, any loss or theft of personal credentials or any situation that may lead to identity theft;
- to keep their video camera on for the entire duration of the lesson, which must frame the students in the foreground, wearing appropriate clothing and provided with the material for carrying out the activities, in an environment suitable for learning and possibly without background noise; participation in the meeting with the video camera deactivated is allowed only in special cases and upon a motivated request from the student to the teacher before the start of the session; after a first recall, the teacher gives a disciplinary note to the students with the video camera still disabled without permission, thus excluding them from the lesson and the absence must be justified;
- to keep the microphone off when teachers or other classmates speak, turning it on if asked or authorized by the teacher;
- to use the chat associated with the video lesson for educational purposes only;
- not to initiate videoconferences and / or associate and / or remove participants in the video-lesson: in fact, only teachers can invite students to the video-lesson according to the established timetable;
- not to record the video lesson unless explicitly authorized by the teacher;
- not to extrapolate from the lesson images or audio recordings that can be shared; • not to disclose confidential information, personal data or violate the privacy of other students;
- not to upload material that violates copyright;
- not to alter, remove or damage the platform configurations;
- not to harass or insult other people;
- not to transmit or share information, images or other materials that may contain content of an obscene, blasphemous, defamatory, or contrary to public order and applicable laws.

The violation of the rules of this regulation may lead to disciplinary measures by the school that do not preclude further interventions by the competent authorities if such behaviours have civil or criminal relevance also in relation to the violation of the laws protecting the personal data of individuals.

**Family-School Relations**

Even in the impossibility of face-to-face meetings with families, the necessary relationship between the school and the family environment should be fostered through information activities and sharing of the didactic-educational proposal.

Through the electronic register, the communication of the didactic activities carried out, the reporting of any disciplinary notes and the annotation of information relevant to families will be taken care of.

Interviews with families and class councils, if not possible in person, will still be guaranteed using Google Meet. Parents can also use the institutional e-mail address (name.surname@ liceomajoranarho.edu.it) of the teachers and the class coordinator for any needs and problems.

**iv. How are policies translated into practice**

In a short time, our school was ready to offer lessons online, Google Suite has been in use for seven years. Thanks to ICT, teachers were able to react and continue teaching, reorganizing the educational process from physical to virtual.

In the first period of closure teachers recorded limited availability of the internet as well as a limited set of instruments, like graphics tablets, particularly relevant for Maths, Physics and Art. On the one hand platforms were the only way to be in contact with students, but on the other hand technology was not always efficient. To match new needs our school provided these tools together with about 100 tablets and 20 laptops, for the students who could not afford one.

In the second phase of closure, classes were split into two: half of the students at school and half in distance learning all the classes were provided with microphones to soften noises and improve the quality of audio. A quick training was organized to become familiar with the main applications of Google Suite. Most teachers became gradually more confident, some followed extra specialized training webinars organized by different Agents to learn more about platforms, software, apps, online teaching tools and also methodology and became more familiar with distance teaching and enhance the educational offer.

**v. Examples of good/interesting/useful practice**

The use of ICT allowed teachers to experience new teaching methods and also to plan better their lessons, to quickly share materials, to make virtual tours, to quickly check homework, sometimes also with the use of plagiarism programs, to promote the development of students' ICT competences.

Some apps and software proved very useful and will become common in educational practice. The easy access to the mobile phone or other technological devices permits the use of ICT as a common resource.

Most teachers found the possibility to have teachers meeting and class council meetings online very positive.

A high potential of digital learning was also experienced in teaching foreign languages with guests abroad, for example organizing on-line conferences with other countries partners and virtual learning exchanges, lessons planned with colleagues abroad on agreed contents focusing on relevant cultural topics, this experimentation at international level proved to be mutually interesting and transferrable.

Students report the tools, apps, platforms they used Meet, google documents, jamboard, gmail, drive, digital books, one note, you tube, GeoGebra, Learnings App, ALatin, Myzanichelli, Kahoot, booktab, hub young and person e-text, Open Board, meditation course. Some

students point out that they improved their digital skills and also learnt how to search relevant resources, group work was generally motivating, in fact they appreciated the interactive aspects of some lessons thanks to digital tools.

**vi. Issues/challenges/Limitations concerning use of ICT for staff, for pupils.**

At the beginning of the experience of on-line teaching, there was a general want of specific training for teachers, who suddenly had to manage their classes in distant learning, doing their best while improvising strategies and techniques.

Teachers highlight the lack of devices and methods for excluding cheating and they found it hard to monitor students online. Assessing was also hard, many teachers opted for evaluation of competences in the first closure, but it could not be the only assessment when the closure continued.

It is reported to be particularly challenging the management of the class split into two parts, trying to engage equally students at home and in class, pair work, or group work could not be done for example, for example foreign language teachers found it hard to focus on pronunciation when you wear a mask.

Teachers point out that the use of technology allowed teaching, but students' feedback was less immediate, in addition they reckon that a massive use of technology hinders the teacher-student relationships and makes teaching action less efficient, it is hard to motivate and keep students' attention. Furthermore, even the lack of student-student interaction in an online classroom hinders their learning experience.

In conclusion respondents strongly feel that distance learning was a necessary answer to the sanitary emergency, but many object that distance learning becomes a routine, because the relation between teacher and students is poorly maintained. Teachers also underline difficulties in assessing students, because of lack of efficient control.

Students report problems with lack of internet connectivity, in some cases lack of proper space at home, because they had to share their room with siblings, it was particularly hard for younger students to keep their concentration

**vii. How ready is the school to meet the needs of their learners?**

As shutdown of the school hampered the learning services, teachers, students and parents expressed concerns about sudden interrupted learning and deprivation of socialization. In order to avoid discontinuity and guarantee teaching delivery our school immediately organized online teaching courses, providing basic training for teachers, who with responsibility undertook the challenge. Many teachers chose self-training, others kept training, choosing from a variety of webinars supplied by different Agencies, such as MIUR (Ministry of Education, University and Research), Indire, E-twinning and also School Publishing Houses, Digital Platforms, MOOCs and Teachers' organizations in the attempt to improve the educational offer and meet students' new needs. Thanks to funds allocated by MIUR to schools, it was also possible to match the demand for devices to a number of students and teachers.

In order to foster the internationalization process of the school *Virtual Learning Exchange* lessons with foreign colleagues as well as foreign expert talks were organized, the school also joined a series of international projects to offer students more opportunities to practice foreign languages and develop an internationally-minded attitude despite mobilities being banned.

The school also undertook the challenge of meeting families regularly in videoconference in order to keep them informed about the measures taken by the school and also to support and reassure them during the first lockdown.

**viii. Recommendations**

On-line teaching can be really advantageous if integrated with teaching in presence, but it is not recommended as a unique channel of communication with students. Thanks to the confidence teachers gained with digital devices and tools, now they are more conscious of the importance of ICT, in fact they ask for digital on-life training and support with constant, relevant training courses to learn new online platforms and keep practising. In addition, they also recommend that teachers should be trained on how to better integrate remote and stationary teaching. Finally, they suggest maintaining ICT for specific purposes, such as learning for immuno-depressed students, counselling for teachers, Departments/teachers repository and, on-line meeting with parents, and maybe create a school platform to share methods, good practises, and also to activate on-line courses to learn to use the platform and improve teachers' digital competences.

**7.2 Romania: School Report**

**i. School details**: **Liceul Teoretic "Tudor Arghezi" Craiova**

Liceul Teoretic "Tudor Arghezi" Craiova (http://www.tudorarghezicv.ro) is a Preparatory-12th Grade school founded on 1st September 1961, its name (Tudor Arghezi) being the literary pseudonym of a famous Romanian writer, best known for his unique contribution to poetry and children's literature, whose real name was Ion Nae Theodorescu.

Total number of teachers (2021-2022): **73**

Total number of school students (2021-2022): **1101** divided as follows: 985 (309- primary level, 258- lower-secondary level, 418- upper-secondary level) – at the main location at No 5, Bucovina Street and 116 at the Craiova Penitentiary, which is a subunit of our school.

Total number of classes (2021-2022): **39** classes at the main location in No. 5 Bucovina Street, and another **9** classes at the Craiova Penitentiary - No. 89, Vasile Alecsandri Street.

Levels of organization:

**Primary level** - includes **14** classes (in the school year 2021-2022) at the main location in No 5, Bucovina Street, plus **3** other classes that operate, simultaneously, at the Craiova Penitentiary.

**Lower-secondary level** - includes **10** classes (in the school year 2021-2022) at the main location in No 5, Bucovina Street, plus another **4** classes, one class per level, at the Craiova Penitentiary;

**Upper-secondary level** - includes **7 + 2** classes (9th and 10th) and **8** classes (11th and 12th) in the Theoretical programme: Humanities/ Humane Studies (Profil Uman) - Philology and Social Studies sections and Science/ Real Studies (Profil Real) - Mathematics &Computer Programming and Natural Sciences sections.

The school consists of 2 buildings with 28 rooms, out of which there are 8 laboratories and offices, 2 gyms, a library with over 15,000 volumes, 1 school medical office, 1 school counsellor's office, 1 outdoor sports base, rooms and offices for the principal, vice-principal, Board of Administration Council, secretary office, accounting office, archiving, methodical commissions.

Relationship with the community: parents ("Tudor Arghezi" Association, Parents' Representative Council), partnerships with the local educational community, NGOs and higher education institutions, local / national public institutions / authorities, external partnerships - Erasmus + project partners

**ii. Methodology**:

The Focus Group with teachers, administrators was conducted on Thursday, 4th November 2021 and there were 12 participants with an education background (teachers, the former vice-principal and the ICT teacher who is also responsible with the educational activities in our school),

Beginning with 1st October, the participants were firstly contacted by phone or face to face and on the 8th October, they were sent an official invitation. When they indicated interest in becoming a member of the focus group, Mrs Cristina Radu created a WhatsApp group on the 14th October, for a better and more efficient communication. The focus group teachers were sent a questionnaire, in order for them to get familiar with the suggested topics and have time to think about the answers. They were also sent an ONLIFE dissemination document, as well as a pupil survey, and they were kindly asked to deliver them to their students...

The teachers were invited to attend a scheduled Zoom meeting on the 4th November 2021, and they were announced the meeting would be recorded, for transcript purposes. All of the teachers agreed with that. There were 12 teachers who attended the online meeting (see Annex 1 – List of Focus group participants). The focus group gave us meaningful insights for the ONLIFE project.

**iii. School ICT Policy**

The Google Suite environment (Google classroom platform) was implemented in our school in April 2020, that is within 14 days from the interruption of the classes (not taking into account the spring holiday), due to the efforts of our former vice-principal (Mrs. Cristina Radu) and the Informatics teacher (Mrs Simona Rosu), who is also the member of the management department, responsible with the educational activities of the school. These efforts implied:

- Insertion and management of about 1100 users
- Creation of groups of teachers based on the organization chart: group of all teachers in our school, groups of teachers per board by class, by department, groups of parents
- Organization of the Google Classroom platform, in line with the new structure of classes and teachers;
- Preparation of instructional documents for teachers, in particular instructions for the first access to the platform and tutorials how to use Google Suite, as well as useful links for different applications

Skills in using the PC have been improved, most of the teachers share information through the platform or their WhatsApp group regarding either the difficulties encountered throughout the educational process or the examples of good practices. Although most teachers were open to using technology and online platform in order to teach their subjects, some of them were very reluctant to it and they refused to do online classes and preferred sending tasks to their students through WhatsApp or Facebook, or even on google platform, but without seeing the students on Meet, just uploading new materials and assigning homework.

**iv. How are policies translated into practice**

School managed to implement online teaching through Google Suite quite soon after the lockdown was enforced and it was something completely new for everybody, especially for teachers, who had never taught online before. In order for the educational process to be organized from physical to virtual in good conditions, our former vice-principal as well as the Informatics teacher sent us a lot of tutorials about how google classroom should be used.

In May/June 2020, The Ministry of Education asked every school management department to send them a list with all the devices owned by each school student, in order to have a clear record of those who had no possibility to attend online classes, because they did not own the necessary devices. Most of them mentioned their own smartphone, others mentioned their computers or laptops. However, some months later, in November 2020, only 43 Ipads were received in our school to be offered to those in need. Only half of the students took the Ipads home, partly because some parents were afraid to sign the contracts, according to which they were supposed to pay for the Ipad, in case it was damaged while in their custody.

On the other hand, there were no facilities for teachers, each of them trying to sort out the problem on their own: some of them used their smartphones, others bought a new laptop, as the old one did not have a camera or a microphone, others bought a graphic tablet too (e.g.the Maths, Physics, Chemistry or Art teachers).

Increasingly teachers gradually became more and more confident about their digital skills, especially after attending some training workshops or webinars or online courses organized by different entities. In September 2020 our school purchased a number of 25 laptops and each class was provided with one of them.

**Teachers' responses to the questionnaire**

**v. Examples of good/interesting/useful practice** and **vi. Issues/challenges/Limitations concerning use of ICT for staff, for pupils.**

**I. During the pandemic, what technological innovation had the biggest impact on your life and why?**

- The graphic tablet was the technological innovation with the biggest impact on my life during the pandemic, because I was able to teach my subject online, the students seeing everything I wrote or drew, in real time.
- The digitalization of all activities, in response to the needs of social distancing caused by the pandemic, and, above all, the digitalization of education had the greatest impact on my activity, given that it fundamentally changed the way activities are carried out with students.
- During the pandemic, the technological innovation with the greatest impact was the videoconferencing system, because we made the connection with the students and the other teachers in real time.
- The technological innovation with the greatest impact on me were the Google Classroom and Teams platforms, because they made it possible for me to communicate and work online.
- Professionally speaking, the laptop had the biggest impact on my life, as it made it easier for me to work from home and from anywhere else with students, in safe health conditions. On a personal level, the phone had the biggest impact, allowing me to keep in touch with my beloved ones.
- During the pandemic the phone was the technological invention I was most thankful for, because I was able to stay in touch with my school colleagues and students and very importantly, with my family.

**II. What are the main issues concerned with implementing the use of ICT in your school?**

- The main issues related to the implementation of the use of ICT in our school were the lack of video projectors connected to a computer / laptop in each classroom and limited internet access in certain areas of high school buildings.
- Insufficient or very old infrastructure
- Insufficient devices for teachers or students' families.
- Not all classrooms were connected to the internet
- Not all the teachers had the skills and confidence to use digital tools in their teaching-learning-assessment activity and not all students in the school had the possibility of connecting to the internet.
- The main issue was the state of confusion that characterized the Ministry of Education, which did not know how to manage the situation and to really support this process
- During the early days of online teaching, in our school there were no clear rules regarding the use of ITC, and this led to some time and resource management issues. After a while, the problem was solved
- When the pandemic started, neither the students nor the teachers had any accounts for the needs of the school. So, it took some time and a lot of effort to create the accounts and start the online process
- No control over the students, because turning the camera on during the classes was not mandatory, so we had no idea whether all our students were paying attention or not, whether they were noting anything down or not
- Some teachers simply refused to use google classroom in a synchronous way, for fear the students might record the lesson and make it public. Some teachers had to deal with awkward situations, for example unknown people got connected to a certain class and made fun of the teachers and students.

- Another issue was related to the online tests, as we could not be totally sure whether the students were cheating or not, so there were doubts about the correctness of the test results

**III. What are the main and most interesting experiences in enhancing ICT in your school?**

- Most teachers have learned to use ICT, they have written project applications for the purchase of high school devices. The Google Classroom platform was used.
- Creating accounts on the institutional platform
- Familiarization of teachers and students with the use of the platform agreed at the management level.
- Carrying out methodical activities using ICT.
- Carrying out the activities within the projects carried out at school level through the use of ICT.
- Currently, the fact that there are laptops and internet in almost every classroom offers the possibility to connect students with health problems.
- Mutual help between teachers.
- From my point of view, one of the most interesting experiences was that, despite the lack of previous contact with electronic devices and educational platforms, many of my colleagues managed to acquire the minimum skills to develop the best didactic act. In addition, I found it very interesting how several people in charge of the school mobilized and how they managed, in a short time, to create accounts for all teachers, but also for the large number of students from all levels of education. Another interesting experience that I remember with pleasure is how the statutes were sometimes reversed, the children becoming a real support for teachers, in discovering additional settings of the educational platform they were working on.
- One of the most interesting experiences in terms of ITC formation in our school was the practical training session on the topic of creating and inserting digital signatures into documents. We were shown how to use specific programmes and pieces of software for this purpose, and then we had the change of trying it ourselves... once or more times, until we were able to tick this ability as well.
- Being sent useful links and tutorials on how to use the platforms and applications; a handbook would be useful as well as a digital book with examples of good practices

**IV. What strategies / experiences are there in teachers' professional development for the digital era?**

- I always study, in order to adapt my pedagogical approach to the times we live in. In order to be a competitive teacher, I need continuous improvement, which I had the opportunity to receive either through courses or activities organized locally, or through the experiences offered by European projects.
- Participation in online training activities
- Carrying out educational projects in the online environment
- Adapting activities to the online environment
- I learned to use different platforms for online teaching
- I will always associate with this digital age the fact that I, from the position of doctoral student, managed to get much better in the skin of a student in the online system, to understand his behavior, fears, but also the (naive) methods of evade lessons. In addition, the most important experience in my professional development is the graduation of the doctoral internship and the public presentation of my doctoral thesis, online.
- The experience in professional development that I had in this pandemic period was to support the dissertation online.
- The experiences offered by the online meetings within the European projects.

- I used this unpleasant pandemic time to improve my teaching skills, as much as I could. Therefore, I decided to attend online seminars organized by a series of prestigious training institutions (Cambridge, Fischer, National Geographic), with strong emphasis on the way online teaching can take place to the students' benefit, and how it can make my own life easier.

**V. What are the main (and interesting) experiences in the field of recognition and validation of teaching competences with particular attention to digital skills?**

- I had a student who won the third prize at the Olympics organized by the Society for Excellence and Performance in Computer Science, my students passed the Computer Science test at the Baccalaureate exam.
- I managed to teach the lessons online, the students working at the same time with me, on their own electronic devices.
- Certification of participation in training activities within the Erasmus + Project "My Europe-Your Europe- Your Say"
- In 2020 I took a training course-CRED- which focused on working online. Many of the teachers did not have the opportunity to take computer science courses in college, and the training courses were insufficient in this field. However, we were forced to improve ourselves, and the recognition of skills is from our students!
- I can make various presentations, I can create online quizzes or live worksheets.
- I do not have any certificate attesting my digital competencies, but I gradually noticed, with each lesson that I prepared, that I became better and better when using my electronic devices, when inserting related documents in my educational document, which will arouse the interest of my students and which will facilitate their distance learning. I managed to facilitate quite a bit the acquisition of some notions, otherwise cumbersome, because, having a much greater freedom, I was able to create lessons with a higher degree of interactivity and topicality. I surfed with students on various sites for learning French, I watched videos, short films, movies, I made online items, the activities were done with a much wider range of learning tools.
- -The fact that I was able to participate in online contests, in the online debate camp, in courses and webinars that I would not have been able to reach, physically.
- The "Alexandru Roșu" geographical description contest acquired another dimension online, turning from a county contest into a national contest.
- The effort of some teachers who managed very quickly to organize themselves online and connect the class to the GoToMeeting platform and the parents' appreciation of the teacher's teaching and digital skills. They were guided through video tutorials and were very happy not to use the WhatsApp group.
- From my own point of view, the most rewarding experience in terms of having my digital abilities validated was the first teaching degree inspection, which extended over an approximately 4-hour time. It involved using share screening, shorter or longer films, search engines, PowerPoint presentations, and all kinds of technological aspects to hold 3 classes and a thesis defence. The thesis itself, the subject of which I chose 3 years ago, was called, ironically enough, "Teaching English with Technology"

**VI. What are the main (and interesting) experiences in the field of quality assurance in school education (with particular attention to eLearning quality standards)?**

- Some of the most widely used documents during the pandemic period were the online presence form and activity sheets. They were a computer-based, later on a paper-based version of the regular attendance book we used to fill in while at school. Both versions required a detailed weekly timetable, to fill in with the topic of the lesson, which was supposed to be in accordance with the yearly or semestrial planning. Thus, we were able

to comply with the planning aspect of quality insurance, which is a constantly envisaged aspect in the activity of any school.
- Many standards do not implement performance standards, which means large differences between schools in terms of assessment and grading. Quality can be proven by applying nationally standardized tests, which is not possible at this time for all disciplines.
- In the teaching-learning-evaluation classes I use various modern methods as well as various experiments, practical works.
- Exactly the freedom we talked about earlier, which allowed teachers to overcome themselves and improve their digital skills, in order to align with the current requirements (and needs) of students. Of course, the performance and quality standards have remained the same, but the way they have been implemented and achieved has changed.
- Application of standardized tests / evaluations at national level, by school subjects, focused on performance standards.

**VII. Strengths, weaknesses, risks or opportunities for School System Bodies in promoting ICT in school education**

**Strengths**

- A good specialized training of teachers who use ICT
- Laboratories equipped with computers with internet access
- Students are eager to use information and communication technology
- The use of ICT ensures fluency and continuity of the teaching-learning-assessment process beside the school hours, online consultations or private lessons can be organized with a practically unlimited number of students; the use of ICT also allows the active exchange of ideas and experience with students / teachers from other schools, it allows the rapid and widespread dissemination of information and knowledge, allows communication with shy people or with difficulties in expressing in real time their own ideas for those who are not ready to face an emotional commitment, or a confrontation face to face, it offers options for an efficient organization of time, with minimal costs; supports the desideratum of modern education: endowing the student with a structured set of functional competencies
- maximum spatial-temporal flexibility in accessing information resources, allowing work depending on availability and adapted to the pace of each user
- it generates a relaxed atmosphere in communication, due to indirect contact
- large libraries can be accessed, rare works in scanned format, museums or other locations can be visited virtually
- offers a wide variety of information sources (documents, scanned books, music, photography, movies, multimedia presentations, etc.)
- provides support for extracurricular activities
- parents can be permanently informed about the child's school situation
- facilitates communication in the extracurricular environment
- supports collaborative learning and encourages interactive discussions
- cultivates the group spirit, through interactive discussions and distance collaboration
- allows simultaneous examination under identical conditions for participants
- facilitates the social integration of students in difficulty or with special needs (physical or mental disability, isolated and hard to reach areas, special situations - epidemics, floods, etc.)
- encourages and supports lifelong learning (LLP) and distance learning (ID) as mass education
- the content of the communication can be easily stored, stored and accessed
- through antivirus, firewall and user account with limited rights we can limit access to unrecommended Web resources

- offers a good opportunity for language learning, intercultural exchanges, training as active European citizens
- the school blog or forum can be used both for effective communication between teachers and in the educational process itself, in communication with students and their parents
- switching from a face-to-face teaching system, which included, but was not entirely based on the use of ITC, to the one used during the pandemic was not an easy change for the school authorities to impose or for the teachers to embrace. A strong point was the provision of the necessary tablets to (almost all) those to whom they were not available, so learning was made possible even for the less fortunate ones.

**Weaknesses**

- There is no updated software in high school and the school does not have enough funds to purchase the latest technology
- The school does not have enough funds to purchase state-of-the-art technology
- There is a reluctance of some teachers to use ICT in school education
- There is no person who is available daily to the high school for the maintenance of the material base (computers, tablets, printers)
- The use of ICT does not mobilize participants for a complete and complex communication, the quantity prevails, to the detriment of quality and depth
- it does not offer the certainty of the partner's identity nor the fact that we are in contact with a single partner or an entire group hidden under a single identity cannot capture the full attention of the receiver and has no control over the degree of involvement in the receiver's communication
- external disruptors can be numerous, especially communications with other partners and excessive demand for distributive attention
- lacks naturalness and complexity of direct communication
- does not transmit faithful feelings, emotions, gestures, mimicry
- does not provide a good context for persuasion in didactic communication
- too much information transmitted actually decreases the quality of communication
- in the absence of the receiver, the sender cannot get immediate feedback
- responses are not always expected immediately and cannot be anticipated
- inattention, fatigue, interference of knowledge negatively influences communication can bring loneliness and social maladaptation, by replacing the real world with a virtual one
- can encourage superficiality and reduce the capacity for reflection by replacing deep, original and creative analysis with products obtained through a mixture with those on the Web
- too much accessed information can distract attention from the essence and induces fatigue (quantity at the expense of quality)
- By far the weakest point is the fact that, still, students and teachers alike do not have high-performance devices with which to connect to educational platforms, in optimal conditions.
- there is a reluctance of some teachers to use ICT in school education
- there is no person to be daily available in the school for the maintenance of the material base (computers, tablets, printers)
- one weak point was the lack of clear regulations, especially at the beginning of the online period.

**Risks/Threats**

- Not all students or teachers have financial possibilities that allow them to purchase a smartphone or a proper laptop
- A great risk would be, from my point of view, the deepening of the differences at educational level between the students who benefited from all the digital support and those who encountered / continue to encounter real difficulties in this respect, on the background of the impossibility to purchase devices. adequate.
- Students need tablets.
- Not all students have access to devices with sufficient storage capacity
- Most students will have vision problems due to spending as much time as possible in front of the computer, phone
- Difficulties in socializing between students
- The teaching staff needs high-performance technological means to be able to transmit various knowledge to students.
- one of the most intensely pointed threat is the dehumanisation of both teaching and learning.
- danger of accessing sites with inadequate content (pornography, organized crime, Nazism, terrorism, racism, sects, discrimination, etc.)
- danger of use of false identities in the network, in order to support evaluations or obtain personal data and information or recruitment by persons or networks
- difficult to prevent fraud by "group response" in the case of online evaluations (webcam!)
- danger of network transmission, intentionally or not, of personal data or photos that can be used later for theft, blackmail, etc.

**Opportunities**

- accessing funds to expand the material base
- one opportunity is the fact that exchanging examples of good practice is highly emphasised in various projects, at different levels, therefore we can learn from others.
- I consider it an incentive for teachers of any age to update their digital skills and reinvent themselves.
- Development of technology that allowed students to connect to the Internet
- Carrying out European or national projects that allowed the purchase of laptops to be used in school.
- National and international funding programs in the field of ICT education and use
- Development of internet access infrastructure in Romania
- Intensifying transnational collaboration between schools
- Endowment and limited access in many schools in Romania to information technology and the Internet

**VIII. What are the most important needs of the teaching staff? What are the needs of students/parents? What are the perspectives for improvement? What recommendations would you make?**

**Teachers' Needs**

- Instead of each school promoting separately the use of ICT in school, it should be centralised and organised. It is important to improve education and create educational videos to be used in online learning.
- Offering packages of free software applications, free educational platforms, in Romanian`
- Access to computers, internet, video projector in each class
- Acquisition of 3d printers, VR glasses, robotics components
- Access to print media
- Exchange of experience with colleagues from other countries

- I need a development of digital skills, a virtual library, as support for online teaching
- For teachers it is important to gain access to relevant information regarding the use of technology in teaching, in terms of educational materials and how they can be digitalized.
- The participants highlighted again that it is important for the teachers to be educated and familiarized in digital education. The students are ready, and maybe even more educated in ICT than teachers.
- Also, there was not any guidelines to evaluate the students when the education was shifted fully online. We did not have any indicators or instructions on the assessment of the students.
- What helped to evaluate the students were creating multiple choice questions with limited time to answer, to mitigate the risk of the students "cheating".

**Students / Parents Needs**

- access to a high-performance computer system (computer, tablet, laptop), connected to the Internet
- access to an educational platform
- introductory courses in the use of new technologies
- the need to access the laboratory - in the case of students.
- The need for real training in ICT - for teachers and is also valid for parents, who are often technically overwhelmed by their own children.
- Students, on their part, need to feel part of their own education and encouraged to do the most out of these strange times. Parents must rest assured that their children use tablets, computers, mobile phones for the purpose of education, while trying to eliminate the inherent risks of too much technology. And we would all need clearer rules, stipulating the rights and obligations of all parties.

**viii. Recommendations**

- allocating funds for education, so that it should become a priority
- hiring the maintenance staff of the material base (computers, other electronic devices)
- offering training / advanced training courses for teachers
- In general, the most important needs are a more flexible teacher-student-parent relationship, because, not infrequently, this relationship has been altered due to the association of online work and non-existence of work (especially in the case of file transmission without another intervention from the teacher). There is also a need for an adequate and coherent training at national level of the teaching staff and of the students for the use of ICT, for the modernization of the fund of learning means in school, for the increase of the Internet connectivity. The prospects for improvement are, in my view, good in my school, but bleak in many other schools, especially in rural areas.
- On-line teaching can be really advantageous if integrated with teaching in presence, but it is not recommended as only *channel* of communication with students. Thanks to the confidence teachers gained with digital devices and tools, now they are more conscious of the importance of ICT, in fact they ask for digital on-life training and support with constant, relevant training courses to learn new online platforms and keep practicing. In addition, they also recommend that teachers should be trained on how to better integrate remote and stationary teaching. Finally, they suggest maintaining ICT for specific purposes, such as learning for immuno-depressed students, counselling for teachers, Departments/teachers repository and, on-line meeting with parents, and maybe create a school platform to share methods, good practises, and also to activate on-line courses to learn to use the platform and improve teachers' digital competences.

**IX. What have been the most important efforts in organizational and educational processes to enhance digital developments in your school? Strategy, teaching, learning, administration etc.**

- Connecting students and teachers to the Google Classroom platform
- Preparation of helpful materials for students and teachers: to use the platform, to create classes, to upload materials.
- Writing projects for the purchase of tablets, smart tablets, webcams for video conferencing, laptops and computers.
- Adapting the didactic approach using digital materials, online tools.
- The most important efforts in the organizational and educational processes to improve the digital evolutions in the school consisted in the material endowment of the classes, the training of the teaching staff and of the students.
- Ensuring access to the unique educational platform for all teachers and all students, without exception, the purchase of devices for each classroom.
- Ensuring the teaching staff as well as the students at the educational platform, existing at the school level, this being ensured in a very short time from the entry of online teaching.
- The manager and the administration of the school were involved in equipping the school with high-performance ICT means.
- In response to the requirements of the School Inspectorate, and, implicitly, of the Ministry of Education, our school went to great lengths to collect as many relevant information regarding the students' technological needs, in order to provide the less fortunate ones, who were still willing to learn, with tablets that they were able to use for attending classes during the online period.
- One teacher mentioned that the only effort made in his school was to buy new equipment to improve online learning (new cameras, new computers, new microphones etc.). But still there is a big problem regarding the education of teachers to adapt to digital education.

**Does the school have a strategy for using ICT in the coming months? If so, what are the plans?**

The only instructions given are that all the teachers and the students need to have their account ready and create their online teams in case we need to shift to online learning again

**X.What have been the most important critical issues to enhance digital developments in your school? Teaching, learning, administration etc.**

- There were days when the work schedule had no limits, Whatsapp messages arrived at any time regarding accounts, password reset. The work of the administrator of the platform involved continuous communications with colleagues, students, parents and exhaustion due to the long time spent on the computer. There were situations in which our colleagues, teachers, did not use the platform, the classes being like on vacation.
- There were also situations in which teachers refused to meet online with students, for fear of not managing the critical situations that might have arisen.
- At the beginning of the pandemic, when each teacher tried to carry out his activities with students in a completely new and challenging context, there were teachers, but also students without the possibility of connectivity or with poor digital skills. I was one of the schools that managed to connect teachers and students to the Google Classroom Platform relatively quickly, but there were situations where some teachers were reluctant to use the platform synchronously, as well as students who could not connect to class activities. for various reasons: the lack of a PC or several siblings a single device, which was often a tablet or just a phone, parents reluctant to use the computer and the Internet in their children's school work.

- Critical moments were and will continue to exist due to the variation of the internet signal, the lack of personal technical means of teachers / students.
- The critical points were marked by the onset of the pandemic and the entry into the online system, which brought frustrations in the first two weeks. The school was accused by the parents of not being prepared for distance education, the teachers were unfairly labelled, the students considered it an unexpected vacation and did not show interest in attending classes.
- I consider that the most critical moment was the replacement of face-to-face communication with online communication, which many teachers had to readjust their contents and assessments to form new skills, but also the lack of technical means had a significant contribution.
- As always, the beginning is the most critical part of any process. In addition to the general feeling of fear (an unknown disease, unsure safety measures, lack of supplies), online teaching was initially viewed in a more negative, rather than positive way, there were technical difficulties, ethical issues, fluid guidelines, nobody was 100% sure about their responsibilities and some tried to take advantage of the situation. Fortunately, things got better in time.
- The education system did not provide any guidelines or helped to enhance the digital transformation to the schools. They could for example install cameras in every class or help to renew all the computers and provide good practises for online learning. Nothing was done.

**Inclusion - what happens to pupils who can't access online, don't have Wi-Fi or equipment? How is this monitored and by whom? Are there any special schemes?**

- There were some students that did not have laptops, they would borrow the laptops from school.
- There were some students living in an area where electricity would sometimes get cut and they could not attend the lesson. We tried to make small revisions to fill them in on what they missed.

**XI. What are the good practises for ICT that exist within your school?**

- creating a blog to make teaching materials available to students
- conducting assessment tests or questionnaires using Google Forms for choosing optional packages, reporting activities, online contests, collecting the necessary data
- making educational software, teaching materials that I need or have been provided in Erasmus + projects
- organizing online events using Zoom, Meet
- use of online educational platforms in computer science classes (oracle.ilearning.com, pbinfo.ro, w3schools, scratch.mit.edu, etc)
- realization of projects on the etwining.net platform
- I used the conference login on two devices, because on one of them I had installed a software application that students had to learn to use, and on the other I had needles in the camera and microphone, and a higher speed of data access. Students could access the application by receiving control of my mouse.
- I had a group of students who did internships online. I worked with them and with the students on Google Classroom, being with me teachers in my classes, with accounts in the field of high school.
- I use a variety of sites with games adapted to the subject I teach, and students have learned to make their own materials online.
- The much more intensive use of ICT in knowledge-fixing lessons, which aroused the students' interest: online items, browsing and critical research (together with students) of various educational blogs and vlogs, making short films, etc.

- Some students tended to feel sad or even get depressed because they missed their friends' physical presence, especially around the holiday season. This, in addition to their love of Secret Santa, made me organise a Music Santa, during which they gifted each other with songs.
- Teachers would help each other to try and develop their ICT skills to improve the quality of the online lessons**.**
- The former Headmistress in the focus group mentioned that she created a small one-day seminar to help our school teachers improve their ICT skills.

**12. What is the national political framework related to the adoption of ICT in schools in your country?**

- **What are the key documents?**
- **What guidance and support has been provided?**
- **What training (if any) has been available / undertaken?**
- **What was the ICT answer in Covid context, in your school?**

ICT is studied in Romanian schools, it is a compulsory subject, but not on high-performance devices; schools receive only isolated support in renewing the material base. It is up to the teachers to choose ICT in the lessons.

While it has long been recommended that teachers use ICT tools in their activity, the need for online in addition to/ instead of physical teaching only emerged as a consequence of the COVID-19 pandemic. The political decisions therefore had to be taken while taking into consideration the needs identified at the level of each actor of the educational system: teachers, students, parents, as well as the community at large.

The key documents are the National Education Law, as well as other governmental decrees and ordinances issued in relation to online teaching: National Education Law https://www.edu.ro/sites/default/files/_fi%C8%99iere/Legislatie/2021/LEN_2011_actualizata_2021.pdf

For me, as a teacher of computer science and ICT, the use of ICT is organized in the laboratory, with an hour of class followed by an hour break, in which the laboratory is disinfected. The other classes take place in classrooms equipped with a video projector and laptop, in which both me and the students demonstrate the use of ICT.

The use of ICT is now well organized, in that every teacher and every student has a personal account, thanks to a titanic effort of the people in charge of these aspects in our school. Each account is unique and can only be used for school activities, by means of connecting to Google Suite, most often to Google Classroom.

- The management of the unit was concerned and managed to connect teachers and students to the Google Classroom Platform.
- Students were identified and supported without the possibility of connectivity
- ICT has supported online learning.
- As the school benefited from a pertinent organization, the response was, most of the times, a positive one, because the lessons could be carried out in good conditions.

ICT became used as the sole means of teaching, whether online or offline. Each teacher used their own experience and skills to switch from a face-to-face method to teaching online by using technology.

- The National Center for Education Policy and Evaluation provided sample topics for national exams. For the organization of the virtual class, I received support from EduApps.

- The teachers in the school were trained with the support of computer science teachers and computer scientists on how to use the Classroom Platform.
- The Ministry of Education organized Webinars for all subjects
- CCD and other training providers conducted ICT training courses for teachers
- Laptop, internet connection have been made available to the class.
- The steps for connecting and using the platform were explained.
- Until things became clearer, and at any time afterwards, we were in close contact with the school informatics teachers and other trained members of staff to get assistance in terms of using ITC. We were sent video tutorials, and we also had online training meetings.
- We have been provided with digital manuals on CDs that accompany the printed manual. These are also available online https://manuale.edu.ro/
- On the websites of the school inspectorates there is a section dedicated to open educational resources, but access to them is quite difficult.
- The Ministry of Education offered the TVR Teleschool, a channel with online lessons. http://www.tvr.ro/telescoala.html
- Digitaliada It is a platform with digital educational resources created by teachers in a framework and with well-established procedures. Contains exercises, tests, video tutorials and guides. The Online Learning and Testing section is structured on four levels of access, being dedicated both to principals, teachers from all over the country, regardless of the subject taught, and to parents and students.
- DigitalEdu - open educational resources - A database with digital educational resources created by teachers, organized by disciplines and years of study. Contains links to tests, worksheets, teaching games, movies and simulations
- eTwinning - European eTwinning platform, supported by the European Commission. Through eTwinning, teachers can design and carry out educational projects in partnership between several classes in European schools. They can be projects on study or transdisciplinary disciplines. The registration of a project is done from the eTwinning Desktop, by accessing the platform from the personal account (username and password). Ideas and resources for projects: etwinning.ro/idei-si-resurse-pentru-proiecte-
- If necessary, teachers received tablets to use for online teaching, as well as specific training.
- Training courses were organized through the Teaching Staff House, for the use of web tools. Also, various NGOs have organized other online courses for the use of new technologies in teaching, evaluation, communication.
- The National Center for Policy and Evaluation in Education organized an online training course for evaluation in the national examinations for tenure, baccalaureate, finalization in education.
- Teachers were trained with the support of computer science teachers and computer scientists on how to use the Google Classroom Platform.
- At national level, online teaching courses have been organized.
- The school informatics teachers and trained members of staff held online training sessions, especially at the beginning of the pandemic, on topics such as the use of the Google Suite, digital signatures and so on.

**Students' Survey**

**I. What were your experiences with using technology in your studies?**

- I had some problems but I tried to solve them. The platform that I used was not that great sometimes.
- The experience was satisfactory, using just my phone and my computer. But for the first few months, we didn't know how to organize our classes and homework.
- My experience consisted of the knowledge I had related to applications and editing and design programs.

- Technology helped me a lot during my learning process
- Sometimes I had problems with the platform
- My experience using technology for studying was something new and interesting at the same time
- It is a pleasure to use technology during classes because I learn faster and easier than usual and this keeps my attention longer
- My experience using technology in my studies was a very simple one. Instead of taking attendance physical in a classroom I would just simply turn on my computer from home and study.
- My experiences with using technology in my studies were improving my technology skills, using the internet for more information than for games and discovering so many things about technology.
- My experience was to improve my own learning process and add a new dimension to the overall learning experience.

**II. How was it organised?**

- When we first got into lockdown, the online classes were a total disaster. But after the teachers told us about the online google classroom platform, everything came into normal.
- The process wasn't too complex and it helped me personally to understand how technology works and to adapt in the online environment better
- It was organized pretty well.
- The process was conducted online.
- The learning process was organised in such a way as not to spend too much time in front of the screen
- I think it was ok
- It was pretty well organised with majority of the teachers that now what are doing in the online system
- The learning process based on the use of ICT was interesting and captivating
- Every teacher would have a class on the Google Classroom platform where they would upload all the lessons , homework , quizzes and any type of material that would have helped the students. Besides that, for every class we would meet with the teacher via Google Meet app in a conference where we could talk about the lesson and anything related about that class.
- Every teacher would have a class on the Google Classroom platform where they would upload all the lessons , homework, quizzes and any type of material that would have helped the students. Besides that, for every class we would meet with the teacher via Google Meet app in a conference where we could talk about the lesson and anything related about that class.
- It was organized very well, and it was a great interaction between students and teacher and there were so many funny ways to learn different things.
- It was organised with many informative projects, interesting activities, and very well-prepared courses by teachers**.**

**III. What has worked well?**

- Almost everything except for when we were on a call with the teacher and the app kept kicking us out of the call
- The teaching activities and applications were carried out properly.
- Some classes
- The online classes
- Most of them went well, both the cooperation between students and teachers, and the organization of classes.

- The ability to learn using technology
- Everything has worked well , as we all worked hard and cooperated very well

**IV. Describe the most memorable activities. (Mention the subject, describe the activity)**

- I didn't really have memorable moments
- The most interesting activity was in English about combating human trafficking.
- The most memorable activities were: in Physics – some practical activities were presented; in Romanian, some topics were discussed
- The most memorable activities were the reading classes because they helped me to understand some lessons much better and I could see more opinions of my colleagues.
- I think Biology, because it was a very interesting activity about saving the planet
- The most memorable activities was at psychology, when the teacher showed us how different and unique we are.
- The most memorable activities were on English class, especially when we did the irregular verbs, and we created our own songs with them and The Gunpowder Plot, when we watched and read some texts about the celebration.
- The most interesting activities were during the English class: The most unusual houses in the world; Online meeting with US representatives, our opinion about speaking English in the future
- The most interesting activity was during the English subject: “Educational Infographics on STEAM “, which implied creating an infographic, using text from a topic of our choice, from different STEAM subjects, like Maths, Physics, Biology, Chemistry, ICT
- The most memorable activities were in the Romanian and Geography classes, because we talked very openly about different topics
- The most interesting activities were in English class. For example: Articles describing a place. Miss and Mister Infographic etc
- I liked every single class. Although some people might consider hard learning from home, it’s definitely the teachers who we have to thank for trying to make this period better for everyone and kept us motivated.
- The most interesting activities were in the English class when my teachers present a videoclip about the Human Trafficking . Nefaurius : Merchant of Souls Human Trafficking-Documentary Full . After that, the teacher asked us about that video and people’s character .
- The most memorable activities were those from the Physics classes in the ninth grade, the teacher explained the lessons to us through different sites with applications in which we could figure out for ourselves the result of the exercises.
- The most memorable and interesting activities, which took place during English classes, were: "Animals in danger of extinction", "View from my room", and "An unusual theatre".
- The most memorable activity in the online environment during the pandemic was in the English subject in which I described recipes that I really tried to make afterwards
- The most interesting activity was at the Sociology class, during which we did personality tests, where we were supposed to check our qualities, shortcomings or hobbies we had

**V. What tools, sites, apps etc were used?**

- I used Zoom, Teams and also Classroom, Word
- I used google, youtube, PDF, brainly
- I used google classroom, meet and Microsoft apps
- The applications I used were zoom and google meet.
- The most used application during online are(Meet,WhatsApp,Classroom)and sites are(Wikipedia,etc)
- Photoshop, Canva, Paint
- We worked a lot in Microsoft: Excel, Word, PowerPoint

- Both Microsoft programs and sources of information, such as Wikipedia, were used.
- Initially we collaborated with teachers by email, whatsapp, even on the phone messaging and later we started to use google classroom, meet and zoom, platforms that our school offered us and gave us very easy instructions to access them.

**VI. Which were the best?**

- I think Teams was pretty good.
- The best app was Meet.
- The best were google, youtube
- I think google classroom
- Google Meet
- Both apps worked perfectly fine and were very useful.
- In my opinion, Classroom was the best, because you could add a background and make it more interesting.
- Canva was the best
- They were all recreational and beautiful, for me there was no difference.
- Both Microsoft programs and sources of information, such as Wikipedia, were used.

**VII. Can you describe an activity that did not work well?**

- When I would post something it would take a while for that document to be processed and it was kind of frustrating.
- Usually everything went well, sometimes there were connection problems.
- The activity in which I couldn’ t find the information I was looking for
- One activity that didn't work well was P.E., because it's much harder to do some exercise in front of a camera
- Every activity that was done online worked really well.
- Only those in which we had some difficulties with the internet connection
- I don’t remember any activity that didn’t work well
- There were problems with the internet connection
- I think the activity that didn't work well is "Quarantine Quatrains - pandemic poems" because it was the first activity I did in online classes.
- From my point of view, at the beginning of the pandemic we did not have the necessary technology, which means that in some subjects, difficult to understand online, were not so well developed.

**VIII. What have been the main challenges online?**

- The main challenges online were when we would have problems with the audio. We sometimes couldn't hear each other
- A difficulty was to learn to use apps to get into class, and One challenge was to understand what we are told through technology
- No internet connection, no electricity sometimes
- Sometimes, when I tried to post something
- Learning how to handle the new apps and making online projects without actually communicating with other people face to face
- The main problem during online time was the inability to see or hug our colleagues
- The net, the electricity in the most critical moments
- The main challenges online were the tests that we had to do for getting grades, because we couldn’t know for sure whether what we did was actually received by the teacher
- The biggest challenge was the first time I went online, because no one knew how it worked
- I sometimes didn’t have electricity and I couldn’t finish the assigned task I found it hard to sit in front of a screen for several hours. It was really tiring and it was not so fun.

Sometimes when my device would not work properly I wasn't able to hear, participate or understand what was going on in the classes.
- It was a little difficult in terms of accommodating the use of technology, for about 6 or 7 hours a day. There were also technical problems with the network that made it difficult for us.
- Adapting to the online environment because we were not used to these platforms or this learning
- There were rare moments when the signal was interrupted and it was difficult to understand the information

**IX. How were they dealt with?**

- I had to figure out how to solve it. I would just fix the devices on my own or ask smb experienced for help and if something was not working properly I had to think for a new way of solving the issue, thinking outside the box
- The teachers found new ways to keep their classes going on
- I solved the difficulties by practicing and learning from my own mistakes.
- We found solutions but not every time
- With practice and patience
- They could not be solved, because they were happening for a short time
- The platform got updated and we could see if the test arrived in time.
- The problems were solved with the help of teachers or colleagues who told us what to do
- Some of the ladies in our school put a lot of effort into it and helped us connect successfully to the new platforms.
- Some of the ladies in our school put a lot of effort into it and helped us connect successfully to the new platforms.

**X. How was online work organised?**

- Our main activities were held on Teams and sometimes we would use Meet as well, but only sometimes
- The online work was done in a team or individually
- I had a well- established schedule
- We worked on meet. The work was well organized by the students as well as the teachers, but I consider that it was much more difficult to do certain things in front of the computer
- With the use of technology online work was very organised. With the help of a few apps everything was done in a short time.
- The online work had a good organisation and we hadn't any problem
- The online work was organised by everyone through ideas and suggestions
- Online work wasn't too difficult to do. I remember when I transitioned from physical school to online school to find it very difficult to use the platform and do all my work digitally. But as time passed, I learned how to use this technology and I managed to do all my online work.

**XI. What could have been done better?**

- I am not sure. I think reducing the hours would have helped a lot, because you can't sit in front of the computer for hours
- The hours could have gone better if the connection was a better one, and the sound and image had not been interrupted.
- The programme should have been more flexible.
- In my opinion everything went smoothly and there is no need for changes.
- The speech of several students at the same time
- Nothing could have been done better, everything was perfect.

- It could have been done better if we were ready for online school and we knew what to do.
- For me, everything went perfectly.
- In my opinion, we managed the online classes pretty good, but it would have been better if we had been taught at school how to manage some online homework , before the lockdown,

**XII. What progress has been made with the use of ICT for learning?**

- A first step forward is that of navigation in applications.
- I managed to use apps more easily, to find information faster
- Some apps have made improvements
- I think reducing the hours would have helped a lot, because you can't sit in front of the computer for hours
- Applications have received several improvements
- the progress that has been made in the use of ICT in the learning process is that we have learned to use
- our class had a great improvement when the school started physical,
- we worked so much with some apps from Microsoft Office package.
- We have learnt to use applications better and to improve our digital skills
- After using ICT in the learning process I was able to learn some basic things and use applications on the computer
- I think ICT helped me out a lot. I didn't know a lot of things and ICT taught me a lot of new techniques and technologies
- The progress that has been made with the use of ITC for learning is that we know to use the applications
- Progress has been steady, with better and better audio and video quality and a very good "chemistry" between student and teacher.
- The use of technology in online courses has helped us both to learn new things through online activities and projects, and through amazing advances, which are the result of using technology for information purposes
- We learnt a lot about online world and how to use technology better. It was a helpful situation on some parts.

**XIII. Do you have any other comments about the use of ICT for school work?**

- Using ICT helped me a lot in online school, making me more aware of the importance of technology in our lives
- It was better to do online class for ICT because everyone had at least one gadget to work with.
- ICT helped me a lot in online school, that's how I realized how important technology is nowadays
- Technology has definitely played an important role during the pandemic times. It was received as a challenge for everybody, teachers and students alike. Without it, it would have been hard to stay connected and keep online studying, during such an unexpected period of time.
- My experience with using technology in my studies consisted in the ability to use different applications. I think that technology is very important and beneficial for students and their teachers. The technology can bring positive results in my studies.
- I had both pleasant and unpleasant experiences. Unpleasant when I couldn't attend the class because of the internet or the application, and pleasant when everything went well.
- I used my phone and my computer.

**vii. How ready is the school to meet the needs of learners?**

It now has cable internet connection in the whole school and the classes have a laptop, video projector and 10 classes have smartboards

As shutdown of the school hampered the learning services, teachers, students and parents expressed concerns about sudden interrupted learning and deprivation of socialization. In order to avoid discontinuity and guarantee teaching delivery our school immediately organized online teaching courses, providing basic training for teachers, who with responsibility undertook the challenge. Many teachers chose self-training, others kept training, choosing from a variety of webinars supplied by different Agencies, such as the Ministry of Education, Indire, E-twinning and also School Publishing Houses, Digital Platforms, MOOCs and Teachers' organizations in the attempt to improve the educational offer and meet students' new needs. Thanks to funds allocated by MIUR to schools, it was also possible to match the demand for devices to a number of students and teachers.

In order to foster the internationalisation process of the school *Virtual Learning Exchange* lessons with foreign colleagues as well as foreign expert talk were organized, the school also joined a series of international projects to offer students more opportunities to practice foreign languages and develop an internationally-minded attitude despite mobilities were banned.

The school also undertook the challenge of meeting families regularly in videoconference in order to keep them informed about the measures taken by the school and also to support and reassure them during the first lockdown.

### 7.3 Cyprus: National Report

**i. Introduction**

This report will provide useful information about the school's digital readiness in Cyprus. Providing a complete picture of how schools in Cyprus implement online education highlighting also potential good practices.

**Digital framework, ICT policy/guidance/ support:**

Concerning the use of ICT in schools and their shift to online education some guidelines and instructions were given during the lockdown period. In this framework some instructions given were:

- Teachers to use the Microsoft Teams platform for online education
- During the implementation of the distance learning program, presences and any absences of students are recorded.
- All teachers are required to have an Office 365 account and learn how to create an account for their students.
- The teachers who will implement in their departments a program of modern and at distance education must have attended relevant training programs or have been updated and deepened in the existing training material posted on the websites of the Ministry of Education, Culture, Sports and Youth and of the Cyprus Pedagogical Institute. Teachers who consider that they need further information/training on the distance method should attend the relevant programs at the same time training or refer to the training material on the websites of Cyprus Pedagogical Institute and the Ministry of Education.
- Teaching is adapted to the circumstances of distance education and each subject lasts 35 minutes of which 10 - 15 minutes are dedicated to problem-solving and interactive communication of the teacher with the class. Teachers adapt their teaching, utilizing at the same time the method of asynchronous distance education to cover the respective core knowledge and to satisfy the relevant adequacy ratios.
- Asynchronous distance education mainly performs the complementary, ancillary and supportive role and is not an alternative.
- The creation of a mechanism is also considered a particularly important element of communication between teachers and children. This communication can be done via email, using Microsoft Teams software or telephone, and aims at keeping contact with children, at emotional support, and/or in the sending of educational material. In these cases, it is given special instructions to be careful not to send material that is necessary to be printed and the communication that takes place does not lead to leakage of personal data. Therefore, the group emails are sent using the BCC method (Blind Carbon Copy), which hides the recipients.
- Students who do not have the appropriate technological equipment at home are to be lent during the school year a tablet device. Students who do not have an internet connection at home will be given subscription packages provided by the Ministry of education.

In addition to the instructions, guidelines and information mentioned above some regulations were placed regarding online learning. Such regulations are:

- Delay is not allowed for students participating online (Regulation 22.2 (a) (i-iv, vii, viii)).
- The unjustified absence from online lessons will be recorded
- It is not allowed to violate personal data by using smart devices (e.g., smartphone, tablet) or PC software which used to record audio and video (Regulation 22.2 (a) (xi-xiv).
- Participation and attendance of online learning is an individual responsibility, of each student. Third parties are not allowed to interfere or even interfere with the smooth

running of online learning. The student is obliged to inform their teacher in case there is any other person together and attends the course (Regulation 22.2 (a) (i-iv, vii, viii).
- The student is not allowed to use inappropriate digital material in an electronic platform used for remote teaching (Regulation 22.2 (a) (i-iv, vii, viii).
- It is not allowed to use abusive/offensive language or other slogans on the electronic platform used for distance learning (Regulation 22.2 (a) (i-iv, vii, viii).
- The violation of the personal data of the students in the context of distance learning from teachers and/or the secretariat staff is a disciplinary/criminal offence.

The teachers were also given a telephone connection for technical support by the Ministry of Education and links giving instructions on the use of Microsoft Office and of the Microsoft teams platform.

The Ministry of Education has also provided useful links redirecting to guidelines on online and at distance learning:

http://elearning.schools.ac.cy/index.php/el/odigoi-ex-apostaseos-ekpaidefsi

https://bit.ly/38XERkN

**ii. Methodology for gathering information at a national level:**
The methodology to gather information about the school's digital readiness in Cyprus was through conducting Focus groups. In particular, two focus groups were organized. One focus group with teachers and principals from various schools in Cyprus. To gather information from the perspective of the students, one more focus group was organized with students participating from different schools. With this methodology we were able to gather information and gain insight from many schools and have an overall image of how schools in Cyprus are operating, in regard to technology, and how ready the schools are to transit to online learning instantly and smoothly in case of another emergency.

**Recommendations:**

**From the Focus group of Teachers:**

Teachers suggested that a "handbook" of ideas and good practices on how to use various tools for an interesting, practical and interactive online lesson, is a necessity and needs to be created. This handbook to basically be a document where teachers can share their experiences on digital and online education. Another recommendation made and mentioned by one teacher was that instead of each school promoting separately ICT, this effort needs to be centralized and organized. It is important to improve education and create educational videos to be used in online learning. The videos are to be then integrated into the schools' curricula and implemented in all schools of Cyprus. What was surprising for the teachers was their observation that students are ready, and maybe even more educated in ICT than teachers. This highlights the need for teachers to be educated, familiarized with digital education and gain digital literacy, either by courses offered or by other means. Then this leads to the next suggestion made by teachers about creating guidelines to evaluate online education, including indicators to be met or instructions on the assessment of the students. Lastly, a recommendation was given for a unified online platform to be implemented in all schools of Cyprus. In this platform students and teachers can communicate in real-time, post documents, recordings and lessons, upload material, create events in a calendar, etc.

What is interesting about the results from the focus group of teachers is that they were not informed about the ICT policies and online learning rules as set by the Ministry of education. Also, the teachers were not informed about the training programs of teachers on the use of ICT, and the Ministry has provided useful links.

**From the focus group of Students:**

Students stated that teachers could do the lesson much more interesting if they would use other tools, rather than just PowerPoint presentations and some videos from YouTube. *"The internet provides so much information and tools and teachers did not take the chance to make the lesson more advanced and adapted to online learning"- student from the Focus group.*

In addition, students suggested that it would be better if all learning material to be in digital form, which students can edit and add their notes instantly. One student mentioned that it would be better if he could take digital notes on the worksheets and material provided form the teachers, instead of having to print the material and transfer notes by hand. It was time-consuming.

Moreover, the students suggested that their take-home assignments are to be completing a task in a platform or learning through apps (gamification). In general, they mentioned having more digital take-home assignments, instead of the standard worksheets, which they had to print complete and scan. Another suggestion was that to have students ready to learn online the schools need to provide them with the necessary tools. That means students to be provided with tablets for their assignments and lessons with the material already uploaded on a platform, instead of books. This will be also helpful in case we need to shift to fully online education again, all the material will already be in our tablets and the transition will be much easier. They also mentioned that if all the material is already uploaded on a platform students can read and study ahead of time, forming their time and schedule and learning even on their own

**iv. Suggestions for policymakers, decision-makers / school systems:**

From the results extracted from the focus groups, one important suggestion to policymakers is to make a handbook of good practices and examples that will be unified to all schools in Cyprus and make this handbook accessible to all.

Another suggestion is to integrate related training for teachers of schools in after-school hours. Teachers who are not yet familiar with ICT tools could register for such training. However, they need to be motivated to do so and to be given incentives. Motivation maybe can be achieved through a certification and validation scheme of teachers completing the training, that they are recognized for their digital literacy.

In addition, it would be a good idea to create a validation and recognition scheme of teaching competencies with attention to digital skills.

Teachers also mentioned the idea to create educational videos to be used in online hybrid or even physical learning. Students are more engaged in videos and learn better this way.

Moreover, the policymakers need to create an evaluation scheme for the students participating online.

Lastly, a suggestion for policymakers is to create an online educational platform where students and teachers can interact in real-time and also be able to upload any sharing educational material. This platform could then be used by all schools in Cyprus.

**v. Good practices:**

**From the focus group of Students:**

Students have continuously mentioned that using PowerPoint presentations for the lesson was an improvement from the "traditional" handing worksheets and just printing information on a paper or just reading from a book. It made the lesson more interesting and using images helped the student stay interested and focused. This is the main good practice mentioned by the students.

**From the focus group of Teachers:**

A good practice mentioned by the teachers is that to evaluate them, they used multiple-choice questions with limited time to answer, to mitigate the risk of the students "cheating".

**Technology solutions, pros, and cons:**

To protect the students from leaking their personal data they were requested to have their cameras off. However, this not only distracted the teachers as they felt they were talking to a black screen, but it also affected the students as they would lose focus and do other things behind closed cameras.

**Annex I: Focus group of students Q&A**

**Introduction:**

The Focus Group was conducted on Friday, 19 November 2021 with 3 students from secondary education.

To attract students, we created an invitation with a link to register through Google form. When they indicated interest to participate in the focus group, they were sent an email of confirmation. On the day of the focus group, they were sent the PowerPoint presentation that was going to be presented in case they wanted to prepare themselves. The focus group gave us meaningful insights, from the perspective of the students.

**Discussion Topics**

***Experiences with using technology in their studies***

**What worked well?**

The students did not have any meaningful comments on this question. Rather they mentioned that even though teachers were trying their best with online education it was not the same quality as what would have been in a classroom setting. Teachers needed time to adapt.

**Most memorable activities?**

The students did not have any comments on this question. They did not have any memorable activities from online learning. They only mentioned that it was a nice change to learn from power points, videos and pictures as this is diverse from education in the traditional setting of the classroom.

**What tools, sites, apps, etc. were used?**

- Mostly Microsoft Teams.
- Teachers would use PowerPoint for their lectures.
- In some cases, they would also show us videos from YouTube.

***Main challenges online***

**What could be done better?**

- Students also agreed that teachers could do the lesson much more interesting if they would use other tools, rather than just PowerPoint presentations and some videos from YouTube. "The internet provides so much information and tools and teachers did not take the chance to make the lesson more advanced and adapted to online learning".
- "Many times, our homework was worksheets, that we would normally get in a physical lesson in a normal class. The teachers did not manage to adapt to online learning. Maybe because it was an unexpected change."

- The material used for the lesson is to be more digitalized. One student mentioned that it would be better if he could take digital notes on the worksheets and material provided form the teachers, instead of having to print the material and transfer notes by hand.
- The students of the focus group also suggested that it would be nice if the schools provided their students with tablets for their assignments and lessons instead of books. This will be also helpful in case we need to shift to fully online education again, all the material will already be in our tablets and the transition will be much easier.

**What is better in education online in contrast to stationary education?**

- Using PowerPoint presentations for the lesson was an improvement from the "traditional" handing worksheets and just printing information on a paper or just reading from a book. It made the lesson more interesting and using images helped the student stay interested.

**What were the main challenges/difficulties?**

- Students agreed that even though the quality of the lessons was satisfying for them, sitting in front of a screen for so many hours made it difficult for them to stay concentrated. They would get distracted much easier and since cameras were off it was much easier to get tempted to just leave and do something else, even if it was just to get a snack.
- One student mentioned: "We had implemented online learning for two years. The first year was really difficult as the teachers were unprepared and it showed. Most of the time they were not able to keep the school timeline. Students would get confused and they would not even pay attention to the lessons. The second-year was better. Teachers got used to keeping the school timeline and the quality got a little better. However, I believe that there is still a long way to go."
- The students also mentioned that their classmates would not even connect to the online lesson most of the time. Or they would "cheat" by connecting just for the start of the lesson when the teacher would check which of his/her students connected and then they would disconnect again. The teachers could not monitor effectively the online class. Many times, students would also forget their microphones open and some teachers that were not familiar with technology would get confused and take some time to close the microphone of the students.
- The students also mentioned that when they had to do online tests, most of the students would cheat. There wasn't a way for the teacher to control what they were doing on their computer. They could open other tabs to connect to social media, talk with their classmates, or even copy-paste from the internet. Even if the camera was open during tests, teachers could not control what we were doing on our laptops.
- One student especially highlighted that one of his main difficulties was that he did not have access to a printer. Many times, he wanted to take notes on the material that the teachers gave them. To do that he needed to print the material and then take notes on the paper. Being unable to print the material, making it difficult for his learning process and the way he would pay attention to the lesson. He had to take notes on a blank paper and when he had access to a printer, he would transfer the notes, and this would take time. It would be better if all the documents were accessible to take notes on them digitally.
- Some students were playing around by disconnecting other students from the online lesson, on purpose.

- Then some students would talk to each other on social media and again would get distracted from the lesson.
- A student mentioned that being at home meant that she needed to also take care of the dog and would bark all the time. Not only she was distracted by the barking, sometimes she would leave the lesson, even if it was for 5 minutes, to take the dog out for a walk.
- "We had to be seated in front of a screen for many hours during the day.". A student said that many times he would get headaches from too many hours staring at the screen.
- All the students agreed that at some point they would feel the lack of physical contact and connection with their classmates at school.
- Many teachers took for granted that the students were paying attention to the lesson and did not engage with their students at all.

**How were they dealt with?**

- The teachers were understanding sometimes. For example, if a student would not connect, they would call them on their phone to ask if they are okay and if they can connect, to not lose the lesson and stay behind.

**What progress has been made with the use of ICT?**

- Some improvement was made in the sense that the school purchased cameras and microphones and installed them in the classes. This happened in case some students affected by the pandemic, stayed home participating online. This way they could still be able to participate in the lesson even if most of the students were physical. However, teachers would many times forget their accounts and could not connect to let the online participants participate. Or even if they had students connected online, they would never take them into accounts or ask them if they have any questions.
- Some teachers stopped using the whiteboard in lessons and instead they are now using PowerPoint presentations or digital notepads that are projected into the classroom wall. "This is refreshing" the students stated.
- Moreover, some technology and information teachers are trying harder to teach the students coding in some programs like python or R. This is important as most of the modern jobs require using a computer and being familiarized with technology.

**Annex II: Focus group of teachers Q&A**

**Introduction:**

The Focus Group was conducted on Monday, 11 October 2021 with seven participants with an educational background (teachers, principals, and vice-principals)

The participants were firstly contacted by phone. When they indicated interest to participate in the focus group, they were sent an invitation, in which we mentioned that the meeting would be recorded for transcript purposes. On the day of the focus group, they were sent the PowerPoint presentation that was going to be presented in case they wanted to prepare themselves. The focus group gave us meaningful insights into the ONLIFE project.

**Discussion Topics**

1. **What are the main issues concerned with implementing the use of ICT in your school?**

- If we do not have a good internet connection in schools, we cannot have quality online education. On the other side if students do not have access to a good internet connection, then the quality for them is not nearly as good as with physical learning.
- One teacher especially mentioned that in the case of their school they had infrastructure problems. Meaning that the computers they have installed in the school are very slow and old, making it difficult to support basic programs (like python), etc. and consequently making it difficult for the teachers to do an online lesson using other tools to make it interesting and interactive. Also, the cameras they gave to some teachers were of low quality and the students could not see them clearly.
- A teacher also mentioned that when the pandemic started the students did not have any accounts for the needs of the school (only the teachers had accounts). Therefore, to start online lessons, all the students had to create accounts first and then after a long process, we could do online lessons.
- “Because of connectivity problems, the students could not have their cameras on and therefore we could not see if they were paying attention to the online lessons (because of IPR issues). Or see if they are truly connected”. The teachers felt like they were talking to a wall and not really sure if students even listened to them. "For me, it is impossible to talk about modern online education, without being able to see the students"
- *"We saw many teachers not knowing how to adapt to online learning. Many teachers would just continue to write on a whiteboard and do their lesson as they would normally do, and just doing it in front of the camera for students to see".*
- Another problem we faced in online education was the tests, that would be implemented online, and we could not monitor whether the students were cheating and copying information from others (through social media) or the internet by opening a separate tab. Also, even if the cameras are open, they could have written notes at the side of their desks and we can never be sure if the results of the tests are “honest”.

2. **What are the main and most interesting experiences in enhancing ICT in your school?**

- The teachers did not have any relatively interesting experiences in enhancing ICT in their schools.
- One interesting comment from another teacher was: "Even though teachers in my school would try many tools and experiment with various platforms to see how they can do online lessons better, what impressed me was that the students were already familiar with anything that was given to them. Making me understand that the students are actually way more digitally educated than us and we are left behind".
- Here another teacher mentioned that maybe it would be better if teachers had something like a "handbook" of ideas and good practices on how to use various tools for an interesting, practical and interactive online lesson. A document where teachers can share their experiences on digital and online education.

3. **What strategies/experiences are there in teachers' professional development for the digital era?**

- One teacher mentioned that the Cyprus pedagogical of Cyprus (and some other forums) offered workshops and seminars for the digital development and training of the teachers to become digitally competent and know how to implement educational practices in the digital era.
- One teacher mentioned that in his school they firstly trained the ITC teachers with the aim of these teachers transferring their knowledge to all others.

4. **What are the main (and interesting) experiences in the field of recognition and validation of teaching competencies with particular attention to digital skills?**

- In Cyprus, there aren't any validation and recognition schemes of teaching competencies with attention to digital skills.

5. **What are the main (and interesting) experiences in the field of quality assurance in school education (with particular attention to eLearning quality standards)?**

- There wasn't any quality assurance or reporting with particular attention to eLearning quality standards, in Cyprus.

6. **Strengths, weaknesses, risks, or opportunities for School System Bodies in promoting ICT in school education**

   One teacher mentioned that instead of each school promoting ICT separately, this effort needs to be centralized and organized. It is important to improve education and create educational videos to be used in online learning. The videos are to be then integrated into the schools' curricula and implemented in all schools of Cyprus.

7. **What are the most important needs of the teaching staff? What are the needs of students/parents? What are the perspectives for improvement? What recommendations would you make?**

- The participants highlighted again that it is important for the teachers to be educated and familiarized with digital education. The students are ready, and maybe even more educated in ICT than teachers.
- Also, there were not any guidelines to evaluate the students when the education was shifted fully online. We did not have any indicators or instructions on the assessment of the students.
- What helped to evaluate the students was creating multiple-choice questions with limited time to answer, to mitigate the risk of the students "cheating".

8. **What have been the most important efforts in organizational and educational processes to enhance digital developments in your school? Strategy, teaching, learning, administration, etc.**

- There were not any particular efforts.
- One teacher mentioned that the only effort made in his school was to buy new equipment to improve online learning (new cameras, new computers, new microphones, etc.). But still, there is a big problem regarding the education of teachers to adapt to digital education.

9. **Does the school have a strategy for using ICT in the coming months? If so, what are the plans?**

- The only instructions given are that all the teachers and the students need to have their accounts ready and create their online teams in case we need to shift again to online learning.

10. **What have been the most important critical issues to enhance digital developments in your school? Teaching, learning, administration, etc.**

- The education system of Cyprus did not provide any guidelines or help to enhance the digital transformation to the schools. They could for example install cameras in every class or help to renew all the computers and provide good practices for online learning. Nothing was done.

11. **Inclusion - what happens to pupils who can't access online, don't have Wi-Fi or equipment? How is this monitored and by whom? Are there any special schemes?**

- Some students did not have laptops, we would lend the laptops from school.
  Also, some students were living in an area where electricity would sometimes get cut and they could not attend the lesson. We tried to make small revisions to fill them in on what they missed.

12. **What are the good practices for ICT that exist within your school?**
    - Teachers would help each other to try and develop their ICT skills to improve the quality of the online lessons**.**
    - A principal in the focus group mentioned that he created a small one-day seminar in his schools to help the teachers improve their ICT skills.

13. **What is the national political framework related to the adoption of ICT in schools in your country?**
    - **What are the key documents?**
    - **What guidance and support have been provided?**
    - **What training (if any) has been available / undertaken?**

    The only training available is some seminars and workshops offered by the Cyprus Pedagogical Institute.

**Further Comments:**

It would be a good idea and practice if an online platform, where students and teachers can communicate in real-time, post documents, recordings and lessons, upload material, create events in a calendar, etc., was created and implemented in all schools of Cyprus.

### 7.4 Poland: National Report

**i. School details:**

Liceum Ogólnokształcące im. Zofii Nałkowskiej w Krakowie (http://vii-lo.krakow.pl/) was founded in 1902 as the Second Imperial-Royal College. It had the status of a secondary school. The main emphasis was on teaching mathematics and natural sciences as well as modern languages.

During World War II, the school did not function. There were Nazi military barracks in the building.

In 1945, the school resumed its activity as the 9th Gymnasium and the Girls' High School. The high school had two profiles: humanities and mathematics and natural sciences. In 1950, the school was named the VII Secondary School.

In 1960, the construction of a new school building began. Since 1963, the school has been located in a building at 5 Skarbińskiego Street in Krakow. Currently, 74 teachers work there and 650 students study in 26 classes.

**ii. Methodology:**

The information was gathered during a meeting held on November 17, 2021. The participants were the school principal, two deputy principals, teachers of entrepreneurship, mathematics, psychology and ethics and two researchers from the Pedagogical University of Cracow.

Additionally a questionnaire was circulated among students in period November 17-19. The survey was conducted using the CAWI method in online mode. 143 students participated.

**iii. School ICT policy:**

The ICT policy is regulated by law. Its implementation includes:

- Compliance with the fundamental provisions of copyright law relating to information and communication.
- Understanding the rules of using computer programs.
- Understanding the need for a computer program license.
- Learning about examples of computer crimes and criminal liability for them.

Individual aspects of the specific requirements and recommendations to schools during the pandemic are included in the Ordinance issued by the Ministry of Education on March 11, 2020 and amended numerous times thereafter (23 times until September 7, 2020).

The school uses uniformly, in all classes Microsoft Teams. The license is provided to all schools centrally by the Ministry of Education (however according to a recent central survey in 70,39% of schools it is allowed to teachers to use the communication programs they personally prefer, i.e., there can be a variety of programs applied in the same school. As the survey shows this leads to additional difficulties on the side of students and makes also pedagogical supervision over the teachers harder). However, at the beginning of the pandemic, for the first 2 months, the application was suggested by the Pedagogical University of Cracow, who is cooperating with the school on various levels. Some courses for teachers were held online by PUC staff experienced in distant learning. MS Teams were introduced as a standard tool by the end of May 2020. However no training was offered neither by the lead authority (the municipality of Cracow), nor by Teacher Training Centres.

**iv. How are policies translated into practice:**

The period of growing SARS-CoV-2 coronavirus epidemic in Poland coincided with the duration of the second semester of education in schools in the school year 2019/20. The introduced restrictions forced a quick change in the mode of teaching with a total shift to

distance learning. Both the education system in Poland and its individual entities were poorly prepared for such a transformation. Simultaneously both administrative activities were undertaken under an accelerated procedure and - or maybe most of all - adaptive actions on the level of individual educational units.

The new situation inspired and still inspires to build well-thought-out quality control plans for content transmitted remotely, as well as the procedures, methods and techniques for making them available to students. On this occasion ready-made, resource-based or resource-based solutions may prove useful in the cloud, or on ready for use advanced MOOC platforms and developing educational technologies, also those using gamification, edutainment, virtual reality and artificial intelligence.

**v. Examples of good/interesting/useful practices:**

The following forms of supporting teachers in the field of distance learning have been introduced either by the school itself or by its leading institution:

- a distance learning team was established to coordinate and support the activities of all teachers;
- trainings developing competences in the field of distance learning methodology were organized;
- external training was financed for teachers to develop competences in the field of distance learning methodology;
- external training to develop IT competences was financed for teachers;
- IT support was provided in the use of tools supporting distance learning.

The time of isolation was devastating from the pedagogical and psychological point of view. The school organized psychological and pedagogical support.

For parents of school students:

- Remote conversations with teachers;
- Advice and remote talks with a psychologist and / or school educator;
- Advice and remote conversations with a psychologist and / or educator from a psychological and pedagogical counseling center;
- Parents' guides were made available on the school's website;
- Regular remote office hours of the school pedagogue / psychologist.

For students:

- Remote contact with a pedagogue and / or psychologist (by phone or via profiles on social networks or instant messaging);
- Frequent information exchange and support from the class educator;
- Personal on-call duty of the school pedagogue at school with the possibility of direct contact or by phone;
- Advice and remote conversations with a psychologist and / or educator from a psychological and pedagogical counseling center;
- Remote specialist classes for students (conducted by psychologists and / or class educators);
- Online integration workshops and competitions;
- Corrective and compensatory classes, revalidation and development classes implemented online.

**vi. Issues/challenges/limitations concerning use of ICT for staff and students:**

For 10% of students, computer equipment was obtained from the Remote School project, implemented by the Project Centre Digital Poland. (In rural areas the percentage of students not adequately equipped with the hardware was much higher: 38,1%.)

For learners, the greatest obstacle to the effective use of the distance education there are competency barriers, e.g. no experience in independent learning, no training in time management. Student respondents noted that these barriers are more important than for example, technical limitations related to access to equipment and the internet. This is an important guide in the development of educational methods at a distance in the future. In addition to giving students access to the appropriate equipment, it is also necessary to develop their learning competences.

Loss of interpersonal contact, lack of face-to-face interaction, and physical distance from these factors. These are particular problems and challenges because - in line with a constructivist approach - learner engagement, communication and group learning, and community building are particularly important for learner development.

Students coped with the challenge of distance learning, despite the technical difficulties of teachers with operating the equipment, the lack of Internet access and the use of digital tools. After several months of working remotely, they appreciated the contact they had with teachers and the opportunities for individualizing their work. Students often devoted several dozen hours a week to performing tasks only ordered by teachers with the use of traditional textbooks and notebooks. They really lacked the support of the educators, the possibility of getting help from them when they did not understand something or were unable to perform an exercise. Their ability to learn independently and take responsibility for their own education has undoubtedly increased, which seems to be the added value of working remotely. Students see many benefits of professionally organized and implemented distance education. Hoping that their teachers' digital competences will improve, they expect more attractive educational materials and modern digital tools to be used in this way of learning. The students also emphasized that a successful remote lesson is one during which interaction and discussion with the teacher and peers are possible.

**vii. How ready is the school to meet the needs of their learners:**

All teachers have access to appropriate computer equipment. Majority of them had and still has to provide access to the various resources needed for implementation distance learning on their own - in particular, it concerns internet connection (for working from home) and IT equipment and digital resources. The school provides some remote support tools teaching (for example, e-learning platforms). Although the school partially provides teachers with access to specific resources, they still often use it payed from private resources.

The study shows that there is rather small degree of use of materials available on educational platforms. Only a few people mentioned guides for remote lessons, e-textbooks, online classes, webinars, training and lesson plans. As the reason they pointed out lack of time.

**viii. Recommendations:**

These are formulated in a form of a SWOT analysis of the remote education during pandemics.

Strengths:

- teacher involvement;
- teacher cooperation and information exchange between them;
- good contact with parents;
- knowledge and skills in the field of ICT;
- previous experience with tools IT (for example, Microsoft Teams, electronic journals);
- adjusting the teaching process to the needs students;
- implementation of the core curriculum.

Weaknesses:

- lack of appropriate equipment or Internet access (both students and teachers);
- low student involvement / lack of motivation;
- lack of competences (technical / IT) teachers;
- teachers' reluctance to conduct lessons online;
- difficulty verifying independence of student's work (parents' help);
- carrying out educational tasks, teacher overload;
- no contact with some students;

Opportunities:

- development of digital competences;
- increase in teachers' involvement;
- learning new tools, development of the teaching base;
- variety of techniques applied during the conducted lessons;
- self-empowerment of students;
- more frequent and regular information exchange;
- improving relationships with students;
- individualization of the didactic process (also as a tool for learners during longer absence from school);
- increase in teachers' creativity;
- better cooperation with parents.

Threats:

- no personal contact with students;
- difficulty in implementing educational activities;
- weakened social relations;
- fatigue of teachers and students, decline of motivation;
- difficulties in implementing the core curriculum;
- addiction of students to new technologies;
- difficulty in making objective student grades;
- unable to reach some students;
- not sufficient equipment and / or internet access (both for students and teachers);
- difficulties to asses student’s work from the point of view of its independence.

For many years, education has faced new challenges and one of them is the use of modern technologies in teaching. The modern student lives and functions also in a parallel space - in cyberspace. Teachers, following the students and responding to their needs, should get to know the world of their life and functioning and accompany them in appropriate proportions so that virtual reality does not replace the real one. It is the teachers who should teach the wise use of modern technologies and Internet resources. Meanwhile, experiences from the beginning of the pandemic have shown that neither schools nor teachers were prepared to transfer education to virtual space. Students who were deprived of relations with their peers overnight, and additionally overwhelmed with an excessive number of tasks to be solved on their own, also found themselves in a difficult situation.

Digital education, well designed and thought out, brings many benefits. Its advantages include, among others:

- increasing the effectiveness of educational processes, favoring the development of competences necessary in the future;
- unleashing individual creativity and, at the same time, teaching team collaboration;
- supporting the creation of individual development paths;

- comprehensive development, leveling educational social disproportions, because regardless of the place of residence, it is an educational opportunity for people from poor families;
- it provides the possibility of global education, makes the educational process independent of time, place and space;
- it enables access to works of art, historical knowledge, museum resources in an attractive form for the recipient;
- equalizing development opportunities for people with special educational needs,
- providing students with continuous access to knowledge.

### 7.5 Greece: Doukas School

**i. School dratils:**

In 1917 the private school is founded and in 1970, "Doukas School - Palladio Lyceum" begun their operation in Maroussi, Greece. The aim of the school is to offer high quality educational services using new technologies and by collaborating with international educational organisations and introducing pioneering research projects and innovative practices and educational approaches. The vision of the organisation is to educate "Global Citizens with Greek Identity, equipping them with 21st Century Skills". Doukas School is one of the largest companies in the industry and they are a leader in the field of primary and secondary private education with approximately 1600 students. The organisation employs approximately 500 people.

**ii. Methodology** – how was the information for the case study gathered?

The information was gathered mainly through an interview with the Head of Informatics and Digital Education Ms. Philippi Maria who is perceived as the appropriate person to provide the requested information. Further information that was utilised is also publicly available through our website.

**iii. School ICT policy / guidance / support**

The school has its own ICT department which employs technicians to handle digital devices and applications, so there is a whole structure that supports the part of digital education. The department of digital education organises, designs, and implements in a pedagogical and organisational level the use of digital technologies with the technical support of the ICT department, which has its own procedures and devices, so that it can function properly in terms of digital technology. There is no external support for the acquisition and implementation of digital education. As far as public schools are concerned, there is another structure described by the ministry in which, one of the computer science teachers, is appointed as head of the computer lab, where he/she oversees the digital devices of the lab and possibly the school in general. In other words, there is no separate section.

**iv. How are policies translated into practice**

The school's response to the pandemic was immediate as it transferred most of its operations on-line, without cancelling any classes. In the second year of the pandemic, the school proceeded to better structure the system and the way the lessons are done with the digital tools, and that operated smoothly during the pandemic. The department of digital education quickly trained teachers in distance education, and the ICT department helped organise school systems so that Microsoft Teams could be implemented immediately to build teaching procedures through the application. The following year each group of students in Teams corresponded to a digital classroom so each teacher could teach either hybrid, remotely, or live, with his digital and live classroom.

The WebEx platform, used by public schools, was not used by Doukas Schools each student has a personal computer equipped with the latest Microsoft applications (e.g. Teams, Forms, OneNote). Other applications were used to make the lesson more effective e.g., digital books, tutorials, videos, Flipgrid, Google Forms for digital assessment, One Drive cloud for quizzes and student assessment. The teachers were trained through the Microsoft Education Centre in all the technologies that could improve their course with relevant badges and certifications / degrees in the use of digital tools. There was also an internal training system based on the peer-to-peer model and creation of databases with instructions, tools, peer-to-peer learning (Teams Edu Lab).

**v. Examples of good / interesting / useful practice**

A good practice for learning in a digital environment is to use tools that promote collaboration and self-regulation for both students and teachers, such as OneNote. As educational materials were integrated in to the app, with the connection of multiple sources and collaboration tools, while taking into consideration that in modern education teachers and students self-regulate their learning. Another worth mentioning practice is the application of peer-to-peer teacher training to familiarize them with digital tools during the pandemic.

**vi. Issues / challenges / limitations concerning use of ICT for staff, for pupils**

**Results of teacher focus groups and pupil surveys**

**Pupils Survey**

General: On the 6th and 13th of November 2021, Doukas School organized 4 pupil surveys. Secondary students formulated teams of 3 and participated in small focus groups where they were asked to express their opinion about distance learning. The questions mainly refer to their experience with online learning, their preference between online teaching and teaching with physical presence.

Also, they shared their opinion about the advantages and the disadvantages of moving from school to home learning, the problems they faced and the changes these two years brought to digital education.

An important note is that all participants are Doukas School students, a Greek private school, that implements a 1:1 program with PCs and tablets as early as 4th Grade. Therefore, students were competent and used in utilising technology in their learning process.

**Experiences with using technology in their studies**

*What worked well?*

Students pointed out that they were already equipped with devices and knew how to use them in the context of their school as they have been doing so for several years prior to the pandemic outbreak. Students also mentioned the positive effect of on-line learning in some aspects of their daily lives such as waking up later, just before the start of the lesson.

*Most memorable activities?*

When students were asked of any memorable activities to share, they replied by describing the everyday situation of on-line learning, saying that it was fun to use some of the tools, such as forms or Minecraft, but being away from school, they focused on the lack of socialization and low levels of focus during the on-line sessions, and a student stated that these feelings did not allow them to have very good memories as those they have from participating in f2f activities in school.

*What tools, sites, apps etc were used?*

In another question about what they enjoyed the most and what tools they used, students unanimously mentioned that they liked the applications they used for physical education lessons. Supplementary they cited 3 tools they used as shown below:

- Teams: main platform used for online classes
- Photodentro: platform where all Greek school books are, there are supplementary videos and activities that students used in their online classes
- Electobox: platform for online voting. It was used for school elections

*Main challenges online - What could be done better?*

Students mentioned that the on-line learning in general worked well but it would work better if students' households were better technically equipped (wifi networks, high internet connection, set-up and ready to use devices), as well as the problem that some of them noticed, who mentioned that they had to share technical infrastructure and physical spaces within their house with their siblings and their parents, sometimes overloading the network or the physical space.

*What is better in education online in contrast to stationary education?*

The majority of students answered that they prefer coming school. Only one team mentioned that there are advantages and disadvantages in both, and if they were in front of the dilemma health or school, they would choose health first. They stated that they had to stand in front of an electronic device for hours, and of course, it was difficult to start reading after 8 hours in front of a screen. They consider online learning passive learning as they cannot participate in the same they do as when they are in classroom.

*What were the main challenges / difficulties?*

Students seemed to understand that online teaching affected positively the covid situation. Nevertheless, students referred to the lack of socialization, as most of them had their cameras closed, they could not see each other and interact. Another student mentioned that this change affected their whole life. Students pointed out that it was difficult for them to stand in front of a screen for so many hours as they faced headaches and problems with their eyes. All students agreed that the most significant issue was concentration. It was not easy for them to stay focused and of course they cannot compare it with their concentration when they are in classroom.

*How were they dealt with?*

The general opinion expressed throughout the groups of students was that in terms of the technical infrastructure, that they had the support of the school and ICT department, and that solved most of the problems, on the other hand, in relation to the socialization aspect, students stated that there was not really much to be done.

*What progress has been made with the use of ICT?*

During the pandemic the online learning was improved and to that direction all parties contributed, namely the school infrastructure, students and teachers.

To the question if they observed any progress with the use of ICT, students replied that the advances they noticed were not significant and it depended on how much emphasis the teachers put on the new tools, as the students themselves did not look for new additions to the already existed platforms and applications. During the discussion the following question arose 'Did the technological companies put emphasis on digital education and improved their products or students and teachers became more familiar with the technology and started exploring new tools', students answered that it worked both ways.

To conclude, one of the teams mentioned that the digital education was improved, they now have a tablet with all the information they need and they can study anywhere, anytime with any device.

**Teacher Focus Group**

Meeting Date: 11-11-2021 Time: 14:30-16:00 (online)

Introduction: We were able to acquire thorough information regarding the techniques used at secondary schools in Greece while adopting remote learning by holding a focus group. The focus group was based on semi-structured interview questions that investigated key issues in

the field of online distance education, such as infrastructure requirements, cooperation practices and professional growth, online educational techniques, and digital competencies.

The procedure went smoothly, and the conversation brought up some interesting points. Instead of signing consent forms, participants were told about the meeting's recording and agreed to the GDPR alignhement in regards to the keeping of the data, the research purpose of its use, the ability to ask to erase any information relating to them, etc. As a result, we have documentation that the participants agreed to be recorded for transcribing reasons and were informed that following the development of this report the recorded video would be deleted.

The focus Group was held on Thursday, November 11, 2021, with eight participants. Participants included engaged instructors, persons with extensive educational background, and educational leaders. Their areas of competence varied, encompassing a wide range of school-taught disciplines. Their experience was largely documented through emergency remote instruction during the Covid-19 period.

The topics discussed and a summary of the answers that were provided by the teachers follow.

*Describe your experience in relation to the use of ICT during the pandemic.*

All participants agreed upon and started by mentioning that more important than the tools themselves, based on their own experiences and those of colleagues that were discussed among them, was the availability of the ICT staff on the school premisses that was available at all times, ready to quickly respond to the teachers' needs. Another participant, added, and the rest agreed, that the smooth and efficient operation of the wifi played an important role, and where not evident, issues arose, that were almost impossible to tackle. Therefore cloud tools are of no use if the basic infrastructure is not operating properly. In relation to ICT, teachers stated that it was important that they were extensively engaged in peer working teams, exchanging ideas and practices, throughout the online learning period, and this gave them a platform to discuss the use of on-line tools, and most importantly, being able to discuss the full process of integrating any new tool to their lesson.

*What are the good practices for ICT that exist within your school for communication, teaching and learning online? What were the challenges during the pandemic transition to learning online? (e.g., online platforms, web conferencing tools, etc.)*

The useful digital technologies that were mainly mentioned were:

- Teams
- Forms
- Power Point
- Flashcards
- Padlet
- Kahoot!
- Minecraft

Most of the challenges that participants faced during this transition, had to do with keeping the online lesson interesting enough for the students. For the teachers who were experienced with technology, the most challenging obstacles were the monotonous nature of online video conferences, the search for interactive tools and the need to adapt to the students' way of thinking. The lack of live socialization, playing, even trick, challenges teachers to find fun and "childish" ways of instructing, in order to balance out the psychosocial dimension of students and keep the socio-emotional aspect alive.

Experiences related to the professional development of teachers for the Digital Era and the certification of teaching related digital skills?

During the pandemic, teachers noticed that both themselves and their colleagues intensified their participation in seminars and professional development activities (e.g. Microsoft's Educator Certification – MCE) that further enabled them to effectively engage their students in online learning. They mentioned that many of the seminars were held by the Ministry of Education and that they had a feeling of certainty to teach online, due to their previous ICT experience that the school has already adopted. They agreed that, because the institution has already been making extensive use of digital -and Microsoft- tools and innovations, they feel comfortable about their digital knowledge and skills when attending seminars or teaching digital skills.

*Advantages, disadvantages, possibilities and risks of ICT integration in educational institutions?*

| | |
|---|---|
| **Advantages** | - More efficient and direct communication<br>- More organised administration<br>- Improved time management<br>- Increased participation from disinterested pupils<br>- Less monotonous lessons |
| **Disadvantages** | - Infrastructure dependency for a smooth learning experience<br>- Need of ICT knowledge, experience and support from teachers |
| **Possibilities** | - Even more interactive learning experience<br>- Facilitation in project-based learning activities<br>- Increased rate of pupils participation in various educational digital-themed competitions |
| **Risks** | - Extensive use of digital tools may cause pupils' difficulties in "traditional" writing |

*What improvements would you suggest for successful online education and enhancement of digital development in schools?*

- Provide and employ appropriate and dependable infrastructure (equipment, tools, Internet access) to meet the demands of instructors, support personnel, parents, and students. This means that everyone should have equal access, regardless of their background (e.g., socioeconomic status).
- Provide all individuals engaged with effective, hands-on training. Training should place an emphasis on the development of digital competencies while encouraging creativity in the pedagogies used.
- To analyze the success of online learning, use assessment methodologies. As a result, all practices may be altered as needed, either during or after the implementation phase (e.g., end of school year). Formative evaluation (e.g., informal talks among leaders-teachers) during the semesters is an important proactive tool.
- Facilitate collaboration and communication among schools, regulatory agencies, instructors, research centers, practitioners, student and parent communities, and others. Reciprocal engagement reveals problems and difficulties while encouraging the exchange of concerns, ideas, and best practices.
- Create an action team of professionals that will give ongoing administrative, technical, and emotional assistance to all participants.

*What is the national political framework related to the adoption of ICT in schools in your country? What could policy makers and local authorities do to support hybrid learning in schools?*

Teachers mentioned that during the pandemic and the need to go on-line or hybrid at times, they felt luck to work at a private school as they had the technical infrastructure, the

knowledge, and the continuous IT support. On the other hands, colleagues that work on public schools had neither of the aforementioned.

On another perspective, nor did parents have the proper equipment and knowledge to support their children, especially those from lower-income families, more often found in public schools.

Therefore, the legislatives and policy makers should focus on 3 axes:

- Equipping and supporting schools and households to upgrade their technological infrastructure and equipment.
- Educating teachers, students, and parents of the proper use of technology in a learning context.
- Proactive development of learning content to be used in on-line or hybrid learning environments.

*Conclusion*

The focus group produced a set of valuable results. It recorded the opinion of individuals that practice teaching at a daily basis, offering the project team valuable insight to the lessons learned from the recent experience of on-line and hybrid learning during the COVID-19 pandemic, recognising the advancement on all levels, but also mentioning the several difficulties they needed to overcome, and suggesting changes and improvements to be made.

**vii. How ready is the school to meet the needs of their learners?**

Due to the 1-to-1 model implemented since 2007, in the context of which each student has a personal computer with all the educational content and to engage in all the learning activities. Doukas is considered to have been one of the most well-prepared schools in the country in terms of meeting the needs of students. That doesn't exclude the possibility of any improvements, especially when it comes to teacher training programmes.

**viii. Recommendations**

In order to help students and teachers find the balance between digital and real world, schools should focus on the knowledge and experience developed during the on-line period. This means, that the ways in which children and teachers work in hybrid environments, must be structured because of the way our whole life now moves into a hybrid environment. It is also very important that everyone is trained in ethical matters relevant to digital technologies and data protection and how to properly use any form of technology. We are probably in the 4th industrial revolution, and we have a very big tool called A.I. in our hands, that we must use it properly.

### 7.6 Spain: “Institut Nicolau Copèrnic”, Terrassa, Barcelona

#### i. School details:

This is a public school offering secondary education and upper secondary education (Baccalaureate). Situated at in Terrassa (city near Barcelona), a very industrial city in a working-class area. There are 16 secondary education cohorts with an approximate 450 students aged 12-16, and 2 upper secondary groups with around 70 students aged 16-18. The Centre offers vocational education careers at different levels with a total of 410 students (many in the computer science studies) in blended learning mode. The number of teachers is 82, as well as 10 administrative people. Complete info about the school, tools and daily activities, at https://copernic.cat/

#### ii. Methodology:

Focus groups were held with 4 teaching staff, and another focus group with 5 students that were in the 3rd. and 4th. year of Secondary education, and currently in the first year of Baccalaureate.

The focus group with students was made as a Zoom meeting, which was recorded after the students gave permission to.

Focus groups with teachers was done through questionnaire interviews given the difficulties of gathering all together. A total of 4 teachers were interviewed, including profiles as the head of studies, the ICT coordinator and 2 regular teachers.

#### iii. School ICT Policy

Background: The school ICT policy related to 2020-2002 responds to the general measures that were taken by both the Spanish Ministry of education and the Regional Government. During the pandemics, two were the main measure that were decided: the Ministry order the closure of all schools around the country, which was done.

The Regional Department of Education of Catalonia, on the other hand, established that the last semester of the course 2019-2020 should be done online, finishing all evaluation activities of this academic year this manner.

Later, the Department issued instructions with respect to the opening of schools in the course 2020-2021 from the very beginning (September), following very strict prevention rules. In respect to ICT policy, the instructions given were that all ICT resources should be of individual use, so the regional Government offered one personal laptop to each secondary school student (as well upper secondary) in Catalonia, something that was in fact achieved during the first semester of the course 2020-21 for many schools, but not for all. For example, this school got the equipment late in the second semester.

At the same time, the Department of Education issued the “Digital Education Plan of Catalonia 2020-2023” aiming to contribute, from the school, to the development of the digital skills that the citizens of Catalonia need to live and work in a society in constant transformation. The objectives of the plan are a) Ensuring that students in Catalonia are digitally competent at the end of compulsory education; b) Increase the number of teachers who have the digital teaching competence understood as a key competence of the 21st century; c) Weave a country network with digitally transformed centers that facilitate learning in the context of educational transformation.

The Digital Education Plan of Catalonia is accompanied by a series of actions ranging from teacher training to new endowments of digital equipment for teachers and students, in which specific attention is paid to digital content. Particularly the actions are:

- Teacher training in order to deal with the educational transformation, the plan pursues to improve the digital competence of teachers, with the ability to adapt to different educational scenarios: face-to-face, hybrid or online, which can accompany students in their learning process. The new training offer planned is designed in three levels of digital competence (basic, intermediate, and advanced) and in different modalities or formats: kudis (digital capsules), macrokudi, MOOC (mass open and online courses) and webinars.
- Digital equipment for students: provision of digital devices for public school students from 3rd-4th of secondary school to post-compulsory education (vocational training and baccalaureate), with a range of 293,296 students and endowment for home connectivity for 101,000 students in a situation of vulnerability. The schools are proprietary of the equipment, which is lend to students for free.
- Equipment for teachers at public schools: endowment of 72,412 new digital devices.
- Equipment for Schools: transformation of the wifi-LAN network of 1,230 schools and expansion of fiber optics to improve connectivity.

Additionally, the regional Government is now requesting each educational center to write the so called Digital School Strategy (EDC), which should define and specify the lines of action of a Centre that make it possible for teachers, students and the center to achieve digital competence. To achieve this digital competence, the EDC includes all areas of the center: organizational, methodological, curricular and communicative, which must necessarily be involved and, where appropriate, transformed, from a perspective of innovation and continuous improvement. The objectives of the EDC are grouped into five areas, which have as their goal the maximum achievement of the digital competence of students, teachers and the Centre:

- Achieving digital competence
- Strategic planning and organization
- Teaching methodologies and innovation
- Digital and gender inclusion
- Security and data protection

As part of this strategy, the government started a programme for supporting what is called “digital tutors”. The tutor (a teacher usually) will be in charge of accompanying, implementing and evaluating the digital strategy in the Centres. Specifically, through the support of mentors, teachers will be trained in digital skills as part of the school’s educational project; the digital commission will be accompanied in the elaboration of the digital strategy of the center and an internal training will be carried out to achieve the digital competence.

Next academic course (2020-21) and currently, the regional government provided the full Google Suite to all the public school, as well to the charter schools (not the private one, which are very few). The government also provided, in yearly loan regime, a windows-based laptop computer to each secondary school student. Additionally, at the center there are several computer classrooms, digital whiteboards, and 60 Chromebooks that are used on the spot with previous reservation made by the teacher. The school is fully wired.

All these policies are progressing at the Institut Copèrnic, but not all are fully implemented, given the short time. The Centre, which legally holds a certain grade of autonomy (as all schools in Spain) publishes the document called “School Education Project”, in which stablishes the strategy plan. This Project is undergoing an update process (done every 6 months) in order to include the above-mentioned Governmental Plan as well as other measures. The school’s project stablishes that “We educate in the digital competence and the

Technologies of the information by the importance that has in the current society placing it of transversal form in all the curriculum." Additionally, this strategic plan accounts for a ICT School committee which includes, apart from the management, 2 teachers with responsibilities of coordinating all ICT activities, dynamising the Departments, and gathering the needs of the studies and teachers (for instance training). It is supposed that the "digital tutors" mentioned above will be part of this ICT Committee once implemented.

**iv. How are policies translated into practice**

All the mentioned policies are progressing at the Institut Copèrnic, but not all are fully implemented, given the short time. The Centre, which legally holds a certain grade of autonomy (as all schools in Spain), publishes the document called "School Education Project", in which stablishes the strategy plan. This Project is undergoing an update process (done every 6 months) in order to include the above-mentioned Governmental Plan as well as other measures. The school's project stablishes that "We educate in the digital competence and the Technologies of the information by the importance that has in the current society placing it of transversal form in all the curriculum." Additionally, this strategic plan accounts for a ICT School committee which includes, apart from the management, 2 teachers with responsibilities of coordinating all ICT activities, dynamising the Departments, and gathering the needs of the studies and teachers (for instance training). It is supposed that the "digital tutors" mentioned above will be part of this ICT Committee once implemented.

**Other concrete measures**

Before the pandemic and during the course of 2019-20, the Centre Nicolas Copernic already provided to both teachers and students official Google Classroom, and Moodle accounts. No all teachers in secondary education and upper secondary education used the systems since whether to use them or not was decided by the individual teachers on voluntary basis. In terms of vocational education, the tools were used long time ago, since one of the grades is Informatics, and teaching has been blended learning since 2010.

On the other hand, the Centre uses an online management system (Ieduca platform) provided for free by the regional Catalan Ministry of Education. The system allows for teachers to manage their tasks, as e.g. send information to parents in case students do not assist one day, or access to Google Suite, or the school's Moodle, which includes access to each of their cohort students.

Many of these tools were in place at the time of the pandemics, however as mentioned before not all teachers were using them. For instance, Moodle was basically used in few some subjects; the same happened with Google Suite and certain communication tools included in it, e.g. Google Meet. We must bear in mind that the public school system is centralized in terms of organisation, but the didactical use of ICT resources is on voluntary basis to certain extent, decided by the Centres and ultimately, by the teachers.

The main problem at the time of the school closure was that teachers were not ready to confront the consequences, and keep academic contact with the students, while nor all students had the necessary infrastructure (computer, good Internet connection at home or space for study). Although many had certain skills to use cloud learning, initially there was little support from the regional government to prepare an action plan in terms of providing infrastructure to students (a good percentage of students' families in this center are low income), and a quick contingency plan for teachers, leaving the initiative to the school in one-to-one basis. The situation improved very much in 2020-21.

During the closure period (from March till July 2020), following the instructions, teachers contacted by email students once a week to provide homework organized as project work. The idea was more to keep contact with the students, rather than to continue with the

academic planning of this particular year. In students' opinion, they worked little and learnt very little, showing their discontent. Some of the tasks were provided in Google Drive, but not to all teachers and groups. Videoconference communication was very scarce, with very few Google Meet activity, however many students were unable to use it given the lack of family ICT infrastructure.

The management of the school tried to identify the most vulnerable students to provide them with computers, and if necessary, with Mifi connections (mobile wifis) paid by the regional government, or other local authorities (the Centre is part of the Terrassa Consortium of Education, which works with the administration, both local and regional, for coordinating administrative measure and educational activities). At this point in time there was no formal evaluation about the results achieved.

This situation at that point in time unveiled the lack of preparation of the center and the lack of competencies (digital and pedagogical) of teachers to confront this critical situation. Although some (in some subjects) were able to use some tools, a good part of the teaching staff was unable to (having no support) set up alternatives to continue the course with the available tools (Drive, some Moodle). The case was different for vocational education students and teachers used to the blended learning model.

The situation changed radically during 2020-21. All the tools previously mentioned were set up to be used with all the cohorts of students, and teachers were trained to do that. Students got their personal computer, and other technical solutions were solved. We should stress that all the students came back to regular face-to-face activities, as mentioned before.

**Please describe your projects/initiatives**

- The school can be considered to a certain extent a school in the cloud (as all public schools) since all administrative operations and academic tasks are fully online. Through the school portal teachers, managers, administrators, students and families could access to their respective classrooms, tasks, digital resources, and general information about the school life, but this does not happen necessarily. Each student has his/her own computer, and have secure Internet connection at home. Learning management systems as Moodle (for some courses) and specially Google Suite (for all courses) are in place.
- Management of the academic activities is done through an online platform ( Ieduca) with access by administrators, teachers, students and families. A dedicated school portal provides information to all academic community as well entry point for all the above-mentioned tools. This portal is provided regionally, but the specific contents are managed by the school.
- Right now, in cases of confinement, the classroom is equipped with a microphone and a camera for the teacher to meet with the students. They are basic resources, which allow you to take classes to get out of the way that in short confinements go well but would not serve so much for a long confinement.

**v. Examples of good/interesting/useful practice**

- Provision of computers and fiber optic communication for the centers, and provide free computers for all they need: teachers, students and schools themselves
- Provision of free Internet access to vulnerable students' families, apart from computers for the students, for the students to connect with the center in regular basis. This includes technical support
- Follow up of students at risk of exclusion, by the tutors, in order to assess show they are following the regular course either at home or online. This would avoid situations of students disconnected from the school at the times of confinement. A Commission of Absenteeism has been created to follow up students

- In collaboration with the Terrassa Education Consortium, a tutorial accompaniment on the steps to follow to apply for administrative matters, as registration, was used. Also, accompaniment by telephone or video conference in which families who have requested it have been accompanied or either by phone or video conference.
- During the confinement, most students found themselves isolated and disconnected, increasing the demand to locate and communicate with them and their families. In this situation the school mediator (in collaboration with the Terrassa Education Consortium) has had one very relevant role in connecting and passing on important information to families as well as commenting and resolving issues such as the possibility of working from home, if they have material, Internet, computer, etc.

**vi. Issues/challenges/Limitations concerning use of ICT for staff, for pupils.**

At the beginning the lack of digital equipment and good Internet connection at home for a certain percentage of students was an important drawback for implementing online education for all, then the decision was given to teachers in terms of the situation of their cohort of students. Teacher had already some training for using online environments (google Classrooms, etc), but to fully use during this time was an impossible leap for many

Although the digital tools were currently there, not all teachers were ready to apply them with their students, at least intensively. A lack of teacher training, and specially in pedagogical aspects of the use of online tools and resources, and by extension, to hybrid education, has been identified. Now all the operations are face-to-face (except for the courses confined), then the need for its use and for further training has diminished.

Teachers recognized the lack of specific training, not only for themselves, but also for the students, not only on the basics (which is necessary, since many basis errors are done by both) but going deep into the affordances of the tools.

Another aspect teachers complained about was what they consider part of students' digital culture. All students now have a computer, except for those who have broken it. There are many cases that when in September they receive a computer for free, in two months the computer were broken. The current problem with digital resources is that they are fragile and students do not know how to care for them.

Families do not participate very much in the life of the Centre. They need channels of information, as e.g. how to access the information in the school's portal, as for instance the digital agenda, the access to the student's portfolio, etc. The Centre should take care of this aspect providing basic digital competencies and targeted training on the digital school system and tools, for them to participate (at least virtually) in the life of the school and build stronger links with the school community.

**vii. How ready is the school to meet the needs of their learners?**

Formally, the school is ready to strictly follow the rules posed by the regional government for f2f and for cases of students and teachers confined. In the case of teachers, they are substituted immediately. Both teachers and students recognize that this situation has taught all that many things can be done without face-to-face.

In the words of one teacher "A few years ago I saw it as unthinkable to do activities with other Institutes remotely, and now it's something I do quite often. Because the same tools that allowed me to stay connected with students have also helped me connect with other high schools and do activities together. Everything can be profitable and one learns to adapt and use the new tools".

But, although the school live is supported by a digital environment, with tools for communication and learning, provided free by the regional government, it seems that, for the reasons previously mentioned, the schools fail in some respects.

First, there are no established criteria or protocols to decide which digital environments to use. Each teacher takes the classes online or hybrid as best they can. They have received enough training or experience, the teacher has learned based on being in this stressful situation, according to two teachers.

Second, the classrooms are not prepared sufficiently for hybrid education, with a lack of good facilities and technical equipment for good quality videoconferencing, so students, if is the case, can follow lectures from home. Teachers should be always ready for a hybrid lecture, but with an equipment that is better than that of provided (e.g. Google Meet cannot focus well the blackboards).

There is a lack of training in meaningfully using the tools available, going beyond short courses on the tools that were already in place (Google Suite, and productivity tools) apart from the regular courses as competence assessment, dealing with diversity, etc… Probably training pills on case studies coming from real needs of teachers using the digital learning environments provided.

Teachers' digital competences, especially for Cloud-based education and hybrid approaches, isn't strong enough after 2 years of leaving with the consequences of the confinements. Clearly teachers need more practice and time to adapt to a school in the cloud model in times of pandemics, going beyond of what is usually done when confinement cases occur: using videoconferencing for those who are not in the classroom while teaching face-to-face to the others. The same can be said about school leaders, who have demonstrated little initiatives, beyond following up what was given by the regional government.

The new Digital Education Plan 2020-23 from the regional government, when fully deployed, might be an instrument to accelerate the transition to a cloud school in all terms, especially if investment and leadership is provided. But without counting with the educational community these plans can be a dead letter, as many times happen, and schools fear.

**viii. Recommendations**

These are some of the recommendations coming from the participants.

Students: improve digital skills

- The digital skills need to be stablished in each educative stage's curriculum as a Crossfield competence which, besides having an instrumental nature, must contribute to the global improvement of all learning processes and help using digital technologies safely, as well as the defining the digital identity of the students.
- Digital Identifier. In this sense all students (and teachers) will have a Digital Identifier (IDI) for all operations in their centers and with the administration.
- Creating an individual professional dossier of each student, which should ensure a formative evaluation of the digital competences and of other learning processes related to digital production, so that the pupil's evolution could be assessed accordingly.

Teachers: training and accreditation of digital skills for the education in the cloud

- Provide with a digital identifier (IDI) for any operation in their Centres and with the administration
- Agile accreditation system for validating training other than that of the regular official one, which is very bureaucratic, recognizing other types of training and competencies for digital education

Educational institutions

- Teachers, families, and students themselves agree that face-to-face is the best approach to learning. They think that the lack of provision plan for disruptive moments should not

occur in the future. Schools need clear contingency plans in coordination with the administration to different situations, beyond improvising as happened at the beginning

- Provide training pills on realistic case studies coming from the needs of local teachers using the digital learning environments provided for dealing with.
- In the same line, schools should provide training for the whole community, not also teachers, but students and families, in collaboration with the Administrations, but also with other potential providers, and recognize this training as part of the professional teacher's portfolio
- Strong follow up of students at risk of digital exclusion
- Adaptation of the classrooms for hybrid education, providing all the necessary specially in terms of videoconferencing
- Activate a "Institute Digital Strategy" (EDC), as part of the "School Strategy Plan", adding guidelines for consolidate and move towards digital education of the school, and promoting a practical digital culture. This document, specific for each school should define the course of action of the Centre, so making possible for teachers, students, and the Centre to achieve the digital competence. To achieve this digital competence, the EDC covers all areas of the Centre: organizational, methodological, curricular, and communicative which must necessarily be involved and, if so appropriate, transformed, from an innovation perspective and of continuous improvement. This initiative has been planned by the Regional Government, but need concretion by all schools.
- Work closely with both the educational administration and the city authorities. The model "Educational Consortium", which is very common in cities in Spain, works well for supporting the schools in all operations, something that has been of great need at the time of pandemics.

# 8. Recommendations

The literature studied offers a large number of recommendations for education organisations, teachers and teacher education and training. This section seeks to summarise the main ideas and suggestions. These considerations provide leaders like school principals and education officials within local authorities, school inspectorates and Ministries of Education with a general framework from which a set of thematic benchmarks for decision-making, planning and policy-making processes could be developed.

Soobrayan et al. (2020) suggests we must increase the resilience of education systems, to establish systems that are more flexible, fully dedicated to all children, systems that educate through a variety of methods and technologies and that are better equipped to deal with possible crises. They also propose we must aim to preserve and promote quality inclusive education and education for all young people, especially the most marginalized children.

Pollock (2020) considers that the Covid-19 crisis could be an opportunity to change public education to create more equitable school systems in the long term, thinking first about the conditions need to be in place for students to learn and for teachers to teach, and how will leaders adapt the education system to support these conditions.

Mustapha et al. (2021) performed a meta analysis of the resources and digital technologies available for developing education from home. For this purpose, they undertook a review of Scopus and Web of Science databases to find and select literature for a systematic review. The main challenges and solutions from this research were identified and are summarised in Table 2.

Table 2: Main challenges and solutions from literature analysis (after Mustapha et al., 2021)

| Challenges | Solutions |
|---|---|
| constructing curricula, designing student assessment | Take advantage of asynchronous learning (Daniel, 2020) |
| methodological, content perception, technical, and behavioural challenges during sessions and online exams | develop an online learning model, learning outcomes should be rigorously and regularly evaluated to monitor effectiveness (Khalil et al., 2020) |
| teaching pedagogy and learning styles | reformulate teachers and students use of digital technologies , (Sá and Serpa, 2020a) |
| quality of the Internet, how communication is handled | apply more effective digital communication (Ayman et al. 2020) |
| innovative mobile pedagogies | provide pragmatic guidelines for remote mobile education (Hall et al., 2020) |
| improve academic performance and engagement using big data and gamification | provide a learning environment to improve students' familiarity with concepts (Vargianniti and Karpouzis, 2020) |
| evaluate students' readiness in using digital media online | support student readiness for online learning (Küsel et al., 2020) |
| teachers need to facilitate digital education | empower pupils to engage in making and shaping their own digital futures (Iivari, 2020) |
| lowering the expected volume of work for students, shifting to a pass / fail model rather than assessment | identify areas in need of assistance, provide greater access to online digital materials and guidance for working from home (Johnson et al., 2020) |
| student performance, digital divide | gamification improved interest and performance across genders (Pal and Vanijja 2020) |
| significant barriers to adequate access to technology at home due to socio-economic barriers | Systematic improvement to eliminate disparities, improve parental involvement with schooling (Kim and Padilla, 2020) |
| weak technical infrastructure, is everybody is ready to use it? | Improve readiness for online learning (Küsel et al., 2020) |

| | |
|---|---|
| need a digital education culture | important role of leaders in education (Sá and Serpa , 2020b) |
| need to transform online teaching and learning | consider issues of social justice, equity and critical digital pedagogy (Fujita, 2020) |
| how students learn using online environments, support, monitoring for families | encourage more research of online learning and teacher practice (Carter Jr, et al., 2020) |

Bakator and Radosav (2020) proposed the following potential solutions and guidelines for effectively "tackling" the COVID-19 era challenges to education:

- institutions should develop long-term, detailed plans regarding their curricula and courses;
- courses and course schedules have to be in-sync with social distancing measures in manner that will not have a severe detrimental effect on the quality of education;
- national projects should be initiated where financially struggling educators and learners would have a chance to get the necessary technical equipment for conducting online teaching and learning;
- a multiple scenario strategic plan should be developed after operational plans are put in place;
- a unified platform should be used for reporting on the status of classes, curricula, staff and students in educational institutions;
- rigorous standardization and accreditation should be conducted in order to maintain or even improve education quality.

Soobrayan et al. (2020) confirmed that all barriers to participation, learning and well-being need to be removed. They suggested the resilience of the education system needs to be increased and the capacity of schools, teachers and education officials to provide quality inclusive education provided for all children, including in times of crisis. This can only be achieved if education systems analyse, plan, develop, review and provide support strategies in four interconnected critical areas:

1. Access to education;
2. Inclusive quality education;
3. Well-being (mental health and psychosocial assistance); and
4. Safe schools.

### 8.1 Recommendations for education strategy and systems

The COVID-19 pandemic has been a huge challenge to education systems. A high level of preparedness is needed so that education can quickly adapt to the changes in the environment and can adjust themselves to different delivery modes, for instance, remote learning or online learning in situations. Begdahl and Nouri (2021) highlighted how critical it would be for the educational sector to have preparedness plans to ensure safe and functional education in times of crisis.

Lorente et al. (2020) confirmed that it is essential to articulate inclusive educational policies that support strengthening the government response capacity to address the sustainability of education. Allodola (2020) points out that a digital approach requires careful and gradual planning with a view to inclusion, strongly supporting digital skills training and cooperative work for teachers, so that they are all prepared. Bakator and Radosav (2020) proposed suggestions and guidelines regarding solutions for the educational system in the Republic of Serbia. They suggested education reform cannot happen spontaneously, it must be in accordance with a developed strategic plan. Without such a long-term plan, first efficiency will "suffer" and afterwards effectiveness and quality of education will deteriorate.

To manage education in post-Covid times, Basilaia and Kvavadze (2020) suggested that lessons learned from the pandemic should force a generation of new laws, regulations, platforms and solutions for future cases, when the countries, government and population will be more prepared than today. Future digital education policy will have to ensure that exposed inequities are deeply reflected upon and that steps are implemented to ensure that the chasm does not extend further within and across schools.

According to Zhu and Liu (2020), in contemporary digital society, made all the more urgent as a result of the Covid-19 pandemic, the school needs to reinvent itself. Aspects such as training, internet access infrastructure, hardware and software, digital literacy, and students and academics' teaching and learning strategies are essential in this shift. Nilsson (2021) suggested that five phases of crisis management should be implemented for distance education in schools, namely to engage, explore, explain, execute, and evaluate the situation. In schools the Nathaniel and Van der Heyden (2020) crisis management framework should be implemented, using the following steps:

1. Prepare a school crisis plan.
2. Inform and explain the method that will be followed to the students.
3. Inform and explain what is planned for the students.
4. Look at similar crisis situations and learn from them.
5. Have two teams. One team to fight the crisis, another team to be in charge of the crisis exit and post-crisis.
6. Have crisis management courses in schools given by a specialist.
7. Communicate the purpose of distance education to the students.
8. Remind students of the results that can be expected and how they will be achieved.
9. Do what has been decided.
10. Let the students evaluate the experience with distance education to know better next time and learn.
11. Improve readiness to manage future crises by learning and adapting the lessons from the current crisis.

Emergency crisis measures were also considered by Korkmaz and Toraman (2020). The most important measures they suggested to support online learning were enhancing network capacity, reliability of internet speed, information technology support, learning tools, digital learning resources and improving educators' competencies related to online learning environments.

Other measures included guaranteeing every student has access to the internet and other necessary equipment, organizing special preparatory training for outbreaks in the future, establishing better educator, student and parent cooperation, placing more emphasis on teaching real-life problem-solving skills, revising the curricula to make it more effective by the integration of the topics related to self-care, health, hygiene etc., revising educational practices starting from the concept of education itself and making a new structuring program, taking measures to promote educators' creative thinking skills, considering educators as professionals who can manage complex processes rather than technical employees, and making effective plans for the potential extraordinary conditions in the future.

Online programs should be designed in such a way that they are creative, interactive, relevant, student-centred, and group-based (Partlow and Gibbs, 2003). Di Pietro et al (2020) proposed the following elements as part of a successful strategy integrating online and offline teaching and learning activities:

- Guarantee access to internet, at a reasonable speed and availability of devices as basic prerequisites for any online teaching and learning strategy.

- Adopt a Virtual Learning Environment (VLE) giving learners access to educational resources, connecting students with teachers and facilitatating remote lessons.
- Rethink the role of broadcasting education: educational broadcasting can be a useful complement to online programmes as it delivers teaching to those who do not have access to the internet and offers materials across schools within a country or region.
- Improve availability of learning technology for students with Special Educational Needs and /or Disabilities.
- Provide support for teachers: teachers need to learn how to adapt their role to a situation in which they can communicate only online and improve their digital competences. They need to be well trained in the pedagogical approaches best suited for online learning and blended modes (Daniel, 2020), and
- Support parents to help their children: Involve parents in the design of the learning strategy and in its implementation. This implies regular and detailed communication between parents, teachers and the school.

### 8.2 Recommendations for teachers and teaching

The development of the capacity for virtual teaching and virtual classrooms should be viewed as an opportunity and solution, rather than as a burden or unnecessary transition and adaptation (Shenoy et al. 2020). For teachers, Sunita (2020) recommends support for coping with changes, especially meeting the needs of vulnerable and pupils of different abilities.

Remote learning requires a fundamentally different approach to teaching, examples include 'flipped classrooms' (Flores et al., 2020), project-based learning (Mathewson, 2020), and case-based learning (Talukdar, 2020). Teachers also need to re-think contact hours, content, assignments, evaluations, lesson plans and delivery methods. The most appropriate and appealing teaching methodologies based on students' learning preferences. Özer and Suna (2020) confirmed teachers should also re-think evaluation and monitoring methods to determine the impact of learning, by improving methodologies for designing formative assessment and remedial activities (Crăciunescu et al., 2020).

Allodola (2020) suggests we need to work towards the construction of a "school culture". It should change towards fostering education that encourages content-creation, adopts student-centered learning (López-Meneses, 2020) and the logic of participatory action-research (Serpa et al. 2018). According to Ciurmelli et al. (2020), school needs to become a cognitively motivating, relationally welcoming place oriented on the learners and their needs (Batini and Scierri, 2019), providing a positive atmosphere that allows them to develop in a serene environment, where relationships are proponent and stimulating; proposing active teaching that aims at fostering motivation and sense of self-efficacy, developing skills, abilities and study strategies (Scierri et al., 2018).

Velicu (2021) suggests that post-pandemic education would be improved by implementing online platforms for schools to use, making the class available to children who, for various reasons, cannot attend school on-site, having the lessons video recorded and available to students, digital tools for in-classroom education. An LMS can provide the set of tools that houses course content and offers the framework for communication between students, teachers, and parents.

To help overcome the problem of limited time to prepare online learning content, Huang et al. (2020) recommend teachers should make better use of the thousands of open educational resources (OER) published by the education organisations and available in other national and international repositories as well as public online tools, platforms, and enabling technologies. They provide a handbook for the use of OEP (Open Educational Practices) and OER (Open Educational Resources) during the COVID-19 outbreak. They discuss OER competencies for OEP and provide guidelines for teachers and learners to facilitate OEP and OER application.

### 8.3 Recommendations for staff preparation and training

The application of modern ICT in education is imperative, however the changes required when moving learning online are not easily made by most teachers. Consequently, professional development is needed. The relevance of digital pedagogical approaches needs to be recognised as well as the importance of including it in the training curricula to prepare future teachers.

It is necessary to first evaluate whether teachers need to adopt a broader educational philosophy and assess the level of skills and competences of educators to deliver online learning and where necessary facilitate suitable training (Fauzi and Iman, 2020).

Korkmaz and Toraman (2020) discuss the educators' ability to provide online learning practices, they recommend the integration of more courses about online learning into the curricula of teacher education faculties, in order to transform the role of educators from teaching to facilitating. It includes arrangements for teacher educators to remain in touch collectively with student teachers for mutual support and brief and simple updates on learning technologies staff were already familiar with. For teachers they recommend attendance at professional development events, webinars and MOOCs. Mahmut (2020) proposes establishing a professional development program for teachers in collaboration to support professional skills development. Sunita (2020) suggested specialised training to school staff should be provided by the local Ministry of Education specifically for the use of online platforms, learning management systems and remote teaching tools.

La Velle et al. (2020) presented a model framework for a new digital pedagogy for teacher training, discussing the opportunities and affordances available as the post-Covid educational landscape emerges (Figure 9). They suggested that the Covid-19 crisis provides an opportunity to reflect on the idea that practicum experience may be necessary but it should not, in itself, be a condition for teacher learning.


1=set high expectations which inspire, motivate and challenge pupils; 2=promote good progress and outcomes; 3=demonstrate good subject and curriculum knowledge; 4=plan and teach well-structured lessons; 5=adapt teaching to respond to the strengths and needs of pupils; 6=make accurate and productive use of assessment; 7=,amage behaviour effectively to ensure a good and safe learning environment; 8=fulfil wider professional responsibilities

Figure 9: Knowledge enhancement framework for teacher standards (La Velle et al, 2020)

### 8.4 Recommendations to meet the needs of students at different levels / stages

Reassuring students and parents should be a vital element of institutional response, institutions need to take steps to inform, reassure and maintain contact with students and parents. Support for the delivery of education must also be provided (Sunita, 2020) through

online platforms with community level connectivity for the underprivileged (including connectivity and provision of tablets to underprivileged should be prioritized by government agencies and other authorities). Alevizou (2020) considered the critical importance of media literacy, working in schools, communities, and families in light of Covid-19 fake-news by empowering young people to develop critical judgement.

It is important to recognise that online learning is not the same as classroom learning and, therefore, effective pedagogical approaches differ (Moore, 2007). The physical environment and distractions differ, learning is not time-bound beyond scheduled meetings, students cannot gain immediate clarifications or feedback, and teachers have less observational or incidental information to identify, and be responsive to, student well-being issues. Additionally, the introduction of new ways of learning can be stressful and supportive pedagogies enable students to make academic progress and reduce stress. Classrooms that were thriving during the pandemic were the ones where teachers had developed strong, positive relationships with their students and built inviting, yet business-like, communities of learning (Heyck-Williams, 2020).

There is considerable urgency for the development of an effective pedagogy of online teaching and learning (Green, 2020). Yates et al. (2021) proposed the importance of supportive pedagogies for personalisation, authenticity and collaboration. Supportive pedagogies include clear instructions, guidance on managing time, empathetic, well-managed discussions, multiple ways of checking learning progress, multimedia resources, fun collaborative activities, authentic experiences, and providing a structure that encouraged motivation while also giving flexibility. For example, the independent use of time was supported by teachers who curated learning management systems to provide clear plans. An important first step in supportive pedagogy is *preparing* students to be independent and to take responsibility for their own learning.

Supportive pedagogy aligns with Holmberg's (2005) idea of empathy and Noddings (1984) 'ethic of care' whereby pedagogical actions are motivated by the needs of students. Supportive pedagogy is cognisant of students' individual situations and provides support for their wellbeing, which is more complex when interactions are mediated by technology. Providing emotional support is particularly relevant in emergency situations and crises, which students may experience as stressful and where their normal support networks may be limited. A second aspect overlaps with motivation in that supportive pedagogy helps students organise their time and stay focused in the face of distractions.

Considering the needs of pupils and supporting their parents, in distance education teacher guidance and follow-up is necessary as well as adapting resources as part of an individualized education approach (Yazcayir and Gurgur, 2021). About the skills new generations should build to confront present and future situations: d'Orville (2020) says:

"*Resilience and adaptability will be crucial for the next generations. Future employers will highly value creativity, communication, and collaboration, alongside empathy and emotional intelligence. We also need to train students to work across demographic differences, so as to harness the power of the universal collective through effective teamwork and global collaboration. The corollary of such education is pursuing multilateralism in all fields of human activities, especially in the interconnected world we are inhabiting, as so tragically evidenced by COVID-19. No doubt, these skills are essential to navigate the present pandemic—and to prepare for the next one*."

Planning needs to deliberately and thoughtfully take into account the needs of the most vulnerable students, these are the students with the highest needs,

"*the priority has to really be focused on the highest needs students, instead of providing families and students choice for the sake of choice*" (Williams et al., 2021; 14).

### 8.5 Recommendations on approaches to remote learning

Crăciunescu et al. (2020) reflected on the need for a digital transformation, stating,

"*The current context generated by the COVID-19 epidemic requires an approach to the face-to-face, online or hybrid (combined) educational process. The teaching-learning-assessment process will continue through alternative solutions based on new technologies and virtual learning environments, which are an important need as well as an opportunity*".

Digital transformation is:

"*a process that aims to improve an entity by triggering significant changes to its properties through a combination of information, computing, communication, and connectivity technologies*" (Vial, 2019: 118).

Iivari et al. (2020) examined the digital transformation initiated by the COVID-19 pandemic in basic education, the digital divide that was reinforced. They argued that research should better acknowledge children and their digitalized everyday lives. The digital divide is not merely about access to or use of digital technology, but about being able to integrate digital technology into meaningful social practices and gain benefit from it. We should be more active in preparing society for the digital transformation.

Digital literacy itself is critical for a digital transformation (Santos and Serpa, 2017) as a skill to mobilize competences in the selection, authorisation and use of information that comes digitally through the Internet as highlighted by the European framework for digitally competent education organisations (Figure 10).

According to Harris et al. (2020), the rapid adoption of digital technologies for almost all education activities presents opportunities to rethink how many of the teaching and learning practices might occur in virtual environments. Technology adequacy and teachers' readiness are two main components to address in developing a mature online learning ecosystem and its sustainability (Giovannella et al., 2020a). We should also consider how to empower teachers and learners to more proactively shape their digital futures as protagonists who not merely accept digitalization as is but critically reflect on it and try to influence its trajectory (Iivari and Kinnula, 2018).

The review of literature confirmed that schools need to be properly equipped for virtual teaching and learning. For instance by providing teams of experts who can provide valuable support to teachers, students and parents through set-up and training. Complex institutional plans for distance learning should be avoided as teachers should work with what they know.

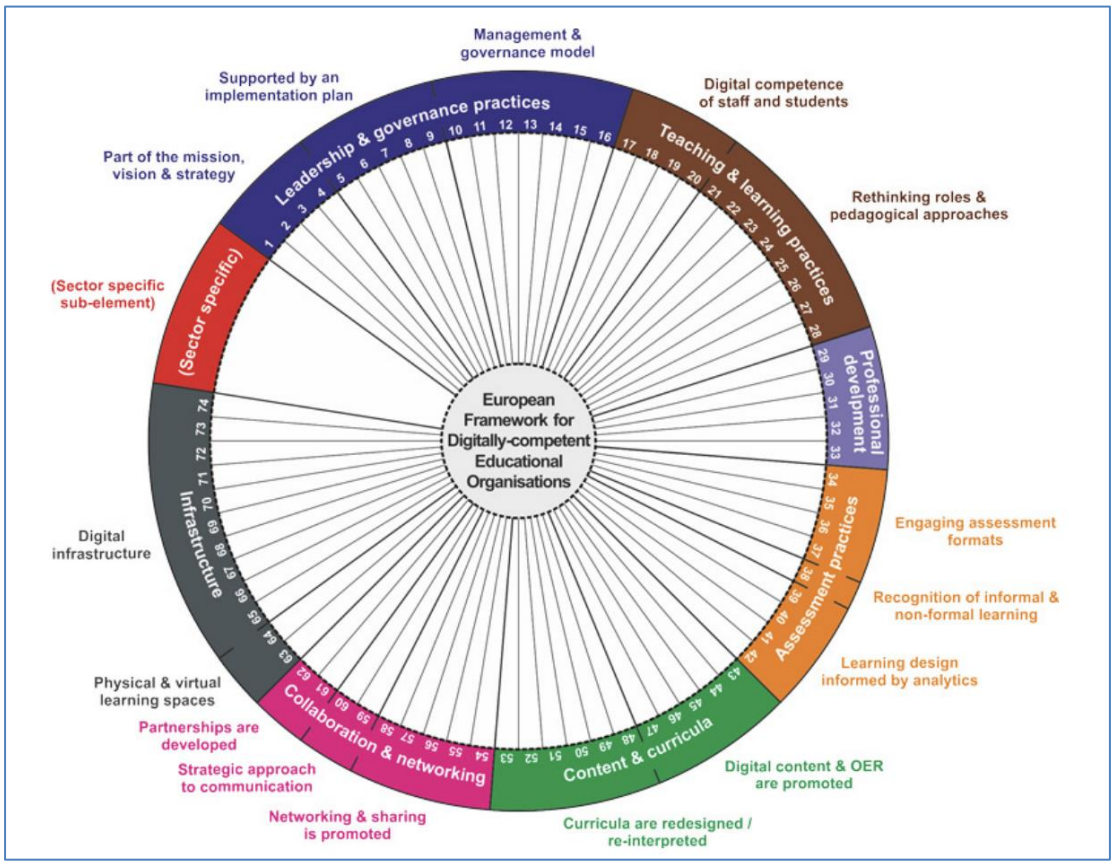


Figure 10: European reference framework for digitally competent education organisations (after Redecker, 2017)

Exploring designs for learning, Begdahl and Nouri (2021) looked at synchronous, blended and asynchronous teaching and learning. Synchronous teaching and learning allows the development of teacher-led lessons which included planned peer-to-peer interactions, short instructions and individual work and feedback where students work individually during regular lesson time. Blended teaching and learning included a combination of synchronous and asynchronous approaches. Teachers tended to minimise the time allocated for peer-peer interaction including planned independent individual studies. Asynchronous teaching and learning emphasised individual work with written instruction and asynchronous submission and little interaction. In ramping up capacity to teach remotely, schools and colleges should take advantage of asynchronous learning in digital formats.

Mladenova et al. (2020) considered that teaching and learning could not be effective when using synchronous only or asynchronous only approaches; this is why both should be implemented. They said the pandemic seriously affected professional communication and relationships, thus they observed that communication was most difficult with the students in the lower year as they did not know their teachers since this is the first course in which they meet. They still did not know each other so well, so there was a lack of teamwork and mutual assistance between them.

The use of effective online instructions facilitates feedback from learners, makes learners ask questions, and broadens the learner horizon (Keeton, 2004). Institutions must focus on pedagogical issues and emphasize collaborative learning, case learning, and project-based learning through online instructions (Kim and Bonk, 2006).

Teachers should take advantage of asynchronous learning as for most aspects of learning and teaching you do not have to communicate simultaneously. Asynchronous working gives teachers flexibility in preparing learning materials and enables students to juggle the demands of home and study. Asynchronous learning works best in digital formats. Teachers do not need

to deliver material at a fixed time: it can be posted online for on-demand access and students can engage with it using wikis, blogs, and e-mail to suit their schedules. Teachers can check on student participation periodically and make online appointments for students with particular needs or questions. Creating an asynchronous digital classroom gives teachers and students more room to breathe.

Technical difficulties can be solved through prerecording video lectures, testing the content, and always keeping a Plan B ready so that the teaching–learning process cannot be hampered. Online courses must be made dynamic, interesting, and interactive. Teachers should set time limits and reminders for students to make them alert and attentive. Efforts should be made to humanize the learning process to the best extent possible. Personal attention must be provided to students so that they can easily adapt to this learning environment.

Social media and various group forums can be used to communicate with students. Communication is the key when it gets difficult to try reaching out to students via texts, various messaging apps, video calls, and so on—content should be such that enable students for practice and also hone their skills.

### 8.6 Recommendations for curricula and assessment

Korkmaz and Toraman (2020) suggest school curricula should be revised and redesigned according to the needs of the current life situation. They recommend that meaningful and flexible curricula should be constructed and more effective lessons about working with online education should be integrated into the curriculum.

When constructing curricula, designing student assessment first helps teachers to focus. Institutions experienced in distance learning often start the process of course construction by designing the student assessments. This is a way of clarifying learning objectives and content that teachers making a sudden transition to remote operation should consider adopting. It will help them determine the parts of the standard curriculum on which they will focus as well as their aims in including other topics.

Teachers should keep two objectives in mind, it is important to continue to orient students' learning to the classroom curriculum and the assessments/examinations for which they were preparing. It is also vital to maintain students' interest in learning by giving them varied assignments.

Teachers should draw on the abundance of high-quality learning material available as freely usable Open Educational Resources. They can use digital tools to create and present digital content for students such as: to create interactive web-based exercises that can be accessed from any smart terminal connected to the Internet (Ex. HotPotatoes), virtual billboards (Ex. Padlet), Concept maps (Ex bubbl, popplet), Quiz (Ex. Simple pool), video recording (Ex. Loom), word clouds (Ex. Wordart).

In circumstances where students have limited access to the Internet and software resources, the teacher can use, for the initial, formative or summative tests, Google forms or applications in the category of student response systems: Kahoot, Mentimeter, Socrative, etc. The teacher will also be able to use, for video conferences, applications such as Google Meet, Zoom, Facebook Messenger, Skype, Webex, etc.

According to Anderson (2021) curriculum acceleration is needed, this refers to the wide variety of educational and instructional strategies that help the students catch up and advance their learning progress. Acceleration requires that educators focus on the 'essentials' of the curriculum and reduce the amount of time spent on review.

Cahapay (2020) attempts to rethink education in the new normal post-COVID-19 era through the perspectives of curriculum. In the post-COVID-19 era, there is a need to consider

education anew as far as curriculum is concerned in terms of goals, content, approach, and evaluation. Educational systems should contemplate reducing the curriculum content, teaching what is “essential”, removing content that is not. He suggests in this respect significance, relevance, and utility need to be considered. A curriculum goal that must be emphasized is to develop preparedness competencies among the learners.

Zhu and Liu (2020) deemed the following were essential:

- to provide open educational platforms that allow students and teachers to access high-quality learning tools;
- to research and assess models of online teaching-learning processes;
- to develop in teachers the ability to carry out online teaching and in the non-teaching staff the ability to support teachers and online systems;
- to encourage cooperation between organizations with the purpose of fostering high-quality online learning;
- to allocate investment and funds to distant learning investing in modern technology;
- to arrange flexible learning sessions, accommodating targeted students time schedules;
- to arrange for online exams for the students;
- to start or improve the existing educational TV channels and broadcast programs for 24 hours a day, to increase the learner’s flexibility to learn;
- to digitalize libraries and make books available on the Internet to all stakeholders.

## 9. Perceptions of the future

A number of researchers focused on post-pandemic futures. Anderson (2021) suggested the digital divide will close at a much faster rate than it has in the past. Technology will be critical to make systems more resilient and provide a continued educational experience at home and at school (Saavedra, 2021). This will be a challenge to define the investment path needed for both the ministries of education and ministries of finance for all children and youth. He confirms educational technology will be an integral component of reimaging schools with the establishment of criteria for the selection and use of technology. The World Bank (2020b, 2020c) has suggested that this should be guided by the educational objectives of reaching all learners; engaging all stakeholders and rigorously and routinely using data to learn what strategies, policies, and programmes are effective in maximising student learning. In a reimagined education world, parents, teachers, and authorities must cooperate and reach a balance to minimise negative health and education impacts (Arundel, 2020).

Preparing for future shocks is essential, this experience must be used to become better prepared for future crises. Schools need to be better prepared to switch easily between face-to-face and remote learning as needed. Teachers must be better equipped to manage a wide range of devices in the event of future lockdown. There needs to be suitable reflection on pedagogical preparedness for the new teaching and learning landscape, very different from ordinary classroom teaching and the changed roles of both teachers and students. Research into conditions for special needs students need to be considered along with effective strategies informing teachers on how to support them through distance education.

Curricula must be sufficiently flexible to be delivered in person or online. The future education system must not be subject to lost learning during the next crisis affecting education. Allodola (2020) describes the necessary research as providing the ability to build, maintain and strengthen relationships in school organization, configuring it as a community of practice. Research based on preparedness plans should be developed that take critical aspects into consideration. As schools were not pedagogically prepared for the transition into temporary distance education, less hybrid forms of teaching, during the Covid-19 outbreak, experiences gained, and lessons learned, may be gathered and collectively evaluated to form the basis of pedagogical plans, for use now and in developing preparedness for the future.

In preparing for the future, policy makers should consult the activities of the Inter-agency Network for Education in Emergencies (inee.org). The mission of the Network is to ensure the right to a quality, safe, and relevant education for all who live in emergency and crisis contexts through prevention, preparedness, response, and recovery.

Benassi et al. (2020) highlighted the important role of research exchanges between school and research, especially concerning the teaching methods, the technologies used, the participation and the Inclusion, curriculum content, organization and school leadership, assessment and training needs. A number of new areas of research should be followed up, for example carrying out studies of the effects of COVID-19 on education and learning, the usefulness of different digital resources for students and to examine whether digital learning can replace some elements of the physical classroom in the future. The purpose would be to establish an analytical basis for reflection, analysis and comparison, where the data collected can be shared with schools and the scientific community, with a view to mutual enrichment.

## 10. Conclusions

The global emergency required the adoption of new teaching methods, strongly based on the use of technologies, and an overall reorganization of education. Some consider online learning to be a failure. Others hope for the return to school and back to usual practices. Others hoped that this situation could turn into an opportunity for a change based on the limitations highlighted by the situation to pave the way for a rethinking of education focused on pupils and their involvement.

Schools have become more resilient to online learning as technology helped them overcome the barriers during the crisis (Ayebi-Arthur, 2017). But a robust IT Infrastructure is a prerequisite for online learning. Dhawan (2020) confirmed the need for a high level of preparedness so that education can quickly adapt and adjust to different delivery modes. Before bringing in and adopting any online tools the purpose and context of technology adoption must be understood by those using them.

The crisis created opportunities for international collaboration on which the resilience and adaptability of education can be built (d'Orville, 2020). It is critical that the academic educational community learns from these experiences and prioritises a forward-thinking and practical scholarly approach (Sunita, 2020). Reflection and evaluation are imperative to keep improving and positively evolving current education offerings.

Andreas Schleicher, OECD Special Advisor on Educational Policy, has suggested that,

"*countries need to use the momentum to reconfigure learning environments to educate learners for their future, not our past. [...] Effective learning out of school during the pandemic placed much greater demands on autonomy, capacity for independent learning, executive functioning, and self-monitoring. The plans to return to school need to focus on more intentional efforts to cultivate those essential skills among all students"* (OECD, 2021: 5).

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