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Navigating through the COVID-19 pandemic: Unfinished learning in primary and secondary education in Tunisia

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Abstract

During the outbreak of the global SARS-CoV-2 (COVID-19) pandemic, Tunisia, like many countries, prepared an emergency plan to shift to distance learning to salvage the academic year and ensure continuous learning. However, a shortage of digital materials coupled with the fact that many households did not have adequate Internet bandwidth made it virtually impossible to secure adequate digital learning. When in-person schooling was restarted in 2020/21, primary, pre-secondary, and secondary school pupils attended school on alternate days to avoid overcrowding. As a result of the pandemic, the curriculum has been lightened, and the fundamentals have been prioritized. Based on a content analysis of the Ministry of Education documents and a survey conducted by the Ministry on remote learning, we shed light on the different measures taken to curb learning loss during the spread of the pandemic as well as the challenges facing Tunisian students and the government. The consequences of these measures are discussed along with future recommendations.

1. Introduction

The SARS-CoV-2 (COVID-19) pandemic has caused disruptions to education systems worldwide. The United Nations (UN) estimates that COVID-19 has wiped out approximately 20 years of educational gains, with an additional 101 million (some 9% globally) of children in grades 1 through 8 having fallen below the minimum reading proficiency levels in 2020 alone. During the global pandemic, the delivery and receiving of education shifted immensely as 91% of the world's student population (over 1.6 billion children worldwide) were impacted by school closures, resulting in a historical shock to education (UNICEF, 2021a). This historical educational shock can potentially worsen a pre-existing 'learning crisis' or 'learning loss' in which many school-age students were already learning very little in school. With

some students not attending school and others forced into online learning education, learning losses range from forgetting what was previously taught to missing what would have been learned if schools had not been closed.

These learning losses and short-term learning deficits have the potential to worsen in the long run (with some projections highlighting that they will accumulate up to 2.8 years of lost learning in the long run; see Angrist, 2021). As students re-enter school far behind the curriculum expectations, they may be too far behind to learn anything from daily instruction and fall even further behind.

In Tunisia, the pandemic has exacerbated the crisis in education. To curb the spread of the pandemic, schools were closed for six months (from March 12 to September 15, 2020), which included the summer vacation (from June 15 to September 15 each academic year). Minimal online instruction was offered, though secondary students' third-term exams,[1] typically required, were canceled (UNICEF, 2020). Returning to school in the academic 2020/21 year, primary, pre-secondary, and secondary school pupils attended school on alternate days to avoid crowded classrooms. As a result, the curriculum has been lightened without giving up the fundamentals. As of the beginning of the 2021 school year, most schools, including universities, in Tunisia had completely reopened without restrictions (UNICEF, 2021b) in the face of a widespread vaccination effort,[2] though a return to remote learning was kept on the table as a plan B for higher education (Sawahel, 2021).

To assess the challenges facing students in primary and secondary education regarding remote learning, the Ministry of Education conducted an online survey in early September 2020 in which 1,837,314 primary, pre-secondary, and secondary students from public schools participated. Based on a content analysis of the Ministry of Education archives and the results of this survey conducted in the education sector during the pandemic, we seek to answer the following question: *What were and are the main challenges facing Tunisia students amid the pandemic*? To answer this question, we first present an overview of the Tunisian educational system, focusing on the different exceptional measures taken by the Tunisian government to ensure educational continuity during the COVID-19 pandemic. We then address some of the challenges faced by the students and families themselves, as well as the government. After that, we discuss future recommendations that could develop an efficient environment for distance learning during any other future crises and highlight the necessity of thinking about an effective strategy to remedy learning loss.

2. Historical overview of Tunisia's educational system

Since its independence in 1956, Tunisia has placed a particular emphasis on the development of the education sector. Public spending on education expanded to the

degree that Tunisia was one of the biggest education spenders in the Middle East and North Africa (MENA). In 2016, Tunisia spent 7.3% of its gross domestic product (GDP) on education (The World Bank & UNESCO Institute for Statistics, 2021). Historically, the education sector in Tunisia has witnessed several significant reforms. In 1958 the Tunisian government sought to unify and nationalize the education system and divided it into three cycles (primary, secondary, and higher education). It made education compulsory and free for all children aged 6–15. The late 1960s witnessed the *Arabization* of the primary education curriculum, granting primacy to the Arabic language and making it the language of instruction. French, the colonial language of choice, became a second language and the language of information and communication which gave access to scientific and technical culture. Around the same time, the *Arabization* of technical and scientific education began to constitute an essential feature of education policy (De Bouttemont, 2002). In 1989, further legislative reform of the education sector was introduced, aiming to enhance the standard of education and to create the best possible balance between training and employment. The reform was formalized by Law No 91-65 of 1991, which reinforced the notion of free education at all levels of education as well as the implementation of basic education.

3.   Structure of the school system

The Tunisian educational system is divided as follows (ILO, 2014):

Pre-primary education

Preschool education is provided in Tunisia for children aged 3 to 5 years. This level of education is optional for now, and it will be made compulsory for public schools by 2025. Public and private kindergartens, *Kouttabs* (Quranic schools), certain public schools, and private schools provide pre-primary education.

Basic education

Basic education (before secondary) is compulsory, and it is divided into two cycles: primary education and pre-secondary education. Basic education lasts for nine years. All subjects related to arts, sciences, and technical education are taught in Arabic at all grades of basic education.

– Primary education: This educational level lasts six years and covers the fundamentals of written and oral language, mathematics, and reading. French as a second language is taught from the second grade, whereas English as a third language is introduced from the fourth grade (Chraiet, 2019). By the end of the final year

in primary school, students take a non-mandatory national exam, which, depending on the score, allows students to enter elite Pilot pre-secondary schools.[3]
– Pre-secondary education (lower secondary): This educational level lasts three years and expands on the fundamentals. It also helps students improve their communication skills in Arabic and the two secondary languages. By the end of pre-secondary schooling, students can sit for a non-mandatory final national examination. Those who take and succeed in the national examination are awarded a diploma corresponding to a basic education certificate (Diplôme de Fin d'Etudes de l'Enseignement de base). The elite students can enter Pilot secondary schools.[4]

Secondary education (upper secondary education)

Students who have successfully completed pre-secondary education are eligible for secondary education in Tunisia. Secondary education in Tunisia lasts for four years. This level of education is divided into two cycles (general academic secondary education and specialized secondary education), with each cycle lasting two years. After completing the general academic secondary school level, students are tracked into the fields of mathematics, experimental sciences, technical sciences, economics and management, arts, computer science, or physical education. Admission to these tracks is determined by a student's score based on particular core subjects. Students must sit for a Tunisian Baccalaureate exam (Examen National du Baccalaureate) after completing specialized secondary school in order to attend college or the workforce.

Vocational and technical secondary education

The Ministry of Employment manages the vocational and professional programs of study. Two-year vocational programs award the Certificate of Professional Aptitude (CAP – Certificat d'Aptitude Professionnelle) upon completion. After completing the first two years of upper secondary school, students can enroll in two-year vocational programs that award a Professional Technician Certificate (Brevet de Technicien Professionnel). Students who successfully complete the professional technician certificate are eligible for two-year higher technical programs. After successfully completing the two years of the higher technical program, students get their Advanced Vocational Diploma (BET – Brevet de Technicien Supérieur).

Higher education

Universities and higher institutes provide higher education in Tunisia, and Tunisia has both public and private higher education institutions. The Tunisian higher education credentials are as follows: (i) bachelor's degree, which takes three years of

full-time study; (ii) master's degree, which takes two years; and a doctoral degree which takes three to five years to complete, depending on the field of study.

4. Quality of education

Regarding educational quality, Tunisia's participation in international assessments such as the Trends in International Mathematics and Science Study (TIMSS) and the OECD Programme for International Student Assessment (PISA) reveals that students perform poorly in the different areas, scoring below the scale average, which is fixed around and at 500 points for PISA and TIMSS, respectively (OECD, 2018; Mullis, Martin, Foy & Arora, 2012; Martin, Mullis, Foy & Stanco, 2012).

Figure 1:   Tunisia mean scores of PISA students' performance
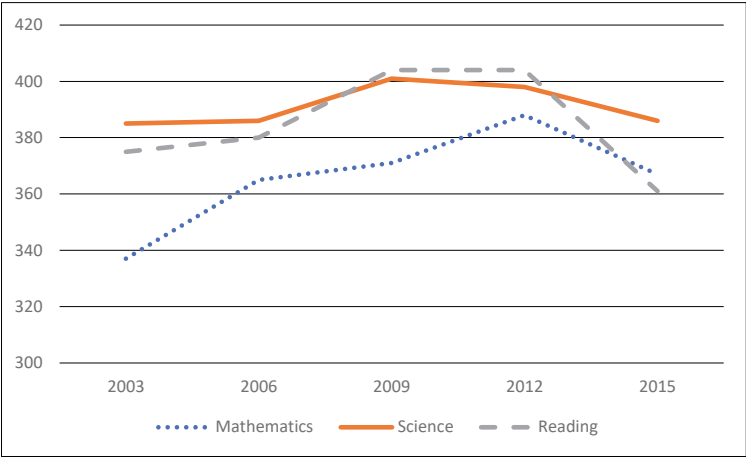
Note: PISA data can be downloaded from https://www.oecd.org/pisa/data/ for the different PISA cycles.
Source: Authors' creation based on PISA Data.

In both PISA and TIMSS, proficiency score levels are defined. They describe what students typically know and can do at given proficiency levels. Proficiency levels range from lowest proficiency level 1 to highest proficiency level 4 for TIMSS and 6 for PISA. The international evaluations have shown that Tunisia faces a severe learning crisis among most students. Given the vast amounts invested, the return on investment (in terms of student outcomes) has been unsatisfactory, and the standard of education has declined drastically (Bouhlila, 2011). For instance, in the 2015 PISA evaluation, Tunisia ranked 66th out of 70 participating countries (OECD, 2018), and the majority of the participating students scored below proficiency level 1

(Figure 1). For Tunisia, a rise in the number of students did not correlate to higher quality education.

More importantly, Tunisia, the home of the Arab Spring and one of the youngest democracies in the region, has not undertaken any significant reforms since the Arab Spring commenced in 2011, so it is challenging to measure the learning loss that has occurred to date. In the aftermath of the so-called Jasmine Revolution, under the governing Troika from 2011 to 2014,[5] the Ministry of Education took a non-interventionist approach to education reforms. In September 2014, the 'Social Dialogue on Education' (*al-Hiwar al-Watani Hawla al-Taelim*) was launched, and it adopted a participatory approach that included related educational sectors, namely, the Ministry of Education, the 'Union of Tunisian workers' (UGTT), the 'Tunisian Forum of Social and Economic Rights' (FTDES), and the 'National Observatory of Youth' intending to reform the education system. However, by 2015 both ministry studies and independent studies noted that teacher absenteeism was becoming prevalent, and the quality, infrastructure, regional disparities, and the skills needed to transition from school to work were severely lacking (Benstead et al., 2015; Jules & Barton, 2018). Before the COVID-19 pandemic hit, Tunisian's educational system was in a state of disarray; it had not undergone any needed major educational reforms from the Ministry. There was dissatisfaction across the system, while private schools were thriving. The employment sector reported a disconnect between the skills students were learning at school and the skills needed for the world of work.

5.   Implementation of ICTs in the education sector

Tunisia has committed to institutionalizing information and communication technology (ICT) in the education sector. The government policy towards integrating ICT in the Tunisian education system was clearly stated in the 2002–2007 policy (Hamdy, 2007). The policy has also emphasized the importance of ICT in equipping schools, introducing ICT as a subject, and providing teacher training. In addition, the ICT programs have taken into account the training of learners in the use of ICT as a tool to acquire knowledge and self-training. The integration of ICT in education is being reinforced through the 'Université Virtuelle de Tunis' (the Virtual University of Tunis – UVT). Initially launched in 2002 to teach Arabic to Tunisian families abroad, UVT provides a remote learning place during the lockdowns. UVT has been designed and created within the 'Institut National de Bureautique et de Micro-Informatique' (INBMI)[6] and is considered an essential basis of the 'School of Tomorrow Reform.' It is an example of pioneer experiences in North African and Arabian countries.

Though it has existed since 2002, the UVT was "neglected in the past, as it lacked the necessary resources before the coronavirus crisis" (Agade, 2020, para. 11). The UVT is a space for virtual classes where teachers and students can interact, either synchronously in videoconferences and collaboratively working on shared documents, or by exchanging documents, activities, and links and discussions in discipline forums between disciplines themselves and their respective teachers. It is also composed of a virtual library; it hosts a collection of free educational resources created by Tunisian teachers and validated by educational inspectors (Agade, 2020). These resources are classified and categorized according to Tunisian educational standards to facilitate searching and indexing. There is also a revision area for the last courses, which is furnished with video revision sequences for students in the Baccalaureate, the second year, and the sixth year of primary school. In addition to a room dedicated to the primary and preparatory grades, various interactive activities, audio-visual resources, and educational books are available for student use. However, nineteen years after its launch, there has never been an evaluation of how effective and successful (or not) the UVT has been. It was very abruptly retooled as its current iteration in the face of the school closures in 2020. Many families nevertheless saw promise in the system and hoped to have it further implemented in the future (ibid.). In 2011, a National Center for Technologies in Education (CNTE) was created. CNTE is under the supervision of the Ministry of Education, and it is in charge of developing and integrating information and communication technologies into the Tunisian educational system. Under the CNTE, UVT is being implemented during the pandemic (ibid.).

6. The chronological sequence of the pandemic with a focus on the most critical stages and consequences for schools

This section describes the most notable pandemic-response actions implemented by the Ministry of Education for the school years 2019/20 and 2020/21 based on the different archives and communications of the Ministry of Education, which can be accessed through the Ministry website.[7] It is worth noting that these exceptional measures applied to both public and private schools in Tunisia. In private schools, remote learning was ensured but without any students' assessments.

Exceptional measures during the school year 2019/20

On March 14, 2020, the Tunisian government ordered the closure of all schools and colleges and banned any public gatherings (Agade, 2020). Since then, the Ministry has taken a series of steps in order to help students catch up on their learning. The first meeting to examine these options took place on March 19, 2020, intending to

study the scenarios for the success of the school year and national examinations. The Ministry of Education agreed to use distance learning strategies to keep the connection between students and educators alive and active. However, it was stressed that remote learning is not considered a substitute for face-to-face instruction and that students will not be tested on what they will learn online. As a result, there were no incentives for students to catch up on their learning in this scenario.

Following that, further meetings were held. The meeting on March 22, 2020 focused on a three-pronged strategy. First, the Ministry of Education planned to set up a practical plan, including mechanisms and technological, logistical, and pedagogical solutions to activate and develop the digital platform in order to provide content, lessons, and digital services to students and educators for the duration of the pandemic (ADEA, 2020). Second, the Ministry of Education noted that it would prepare a logistical, pedagogical, and legal framework to establish an educational television channel. It was stressed that television had the potential to reach most students. Finally, it was thought that using this station for the development and broadcasting of television classes linked to third term programs for the final year students in primary education, pre-secondary education, and secondary education would hopefully help them in preparation for national examinations. It was underlined again that these courses are not a substitute for classroom instruction and cannot be used in the national assessments. The educational television channel 'Al-Watania Educational' was launched in Spring of 2021 with over 200 lessons geared towards Baccalaureate students, taught by a core group of teachers, and supervised by school inspectors (All Africa, 2021).

On March 26, 2020, the Ministry of Education issued a communication urging teachers at all educational levels to take the initiative to prepare documents (whether in Portable Document Format [PDF], Microsoft Word, or Microsoft PowerPoint formats) relevant to the official programs for the third term of the school year. On April 29, 2020, the Ministry of Education, which had already bumped up the spring break in response to the lockdowns, decided to end the school year early (Brookings Institute, 2021). The Ministry shifted its focus to building up the UVT online portal and supporting teachers who were creating lessons and activities by structuring, organizing, and approving them pedagogically. The hope was to make these materials available on the National Center for Technologies in Education's digital portal. Tunisian students were encouraged to follow these courses and use these digital materials at home. The Ministry notified students that hard copies of the lessons will be made available to students who cannot access the platform in their educational institutions. On May 12, 2020, a ministerial decision was taken to bring the school year to an end except for students in the Baccalaureate classes who will take the national examination. On May 28, 2020, schools reopened for complete in-person instruction for

Baccalaureate students from May 28 to June 23, after a period of class suspension that had lasted more than two months. The students were divided into smaller groups. The Baccalaureate national examination took place in early July 2020.

Exceptional measures during the school year 2020/21

Beginning on September 15, 2020, all students returned to in-person schooling from 2020/21. However, in the context of adjusting to the country's multiple health concerns due to COVID 19, the school time was cut in half, and the teaching of students occurred in groups daily to minimize congestion and guarantee social distancing. In addition, it was important to adjust the official programs in primary, pre-secondary, and secondary to the new school time since it is not possible to teach all of the elements of the programs in the same manner in half the time allocated for them. The General Administration for Programs and Continuing Education reviewed, adapted, and modified the content of official programs.

With the upsurge of the pandemic in October 2020, lessons were suspended in primary, pre-secondary, and secondary schools from October 29, 2020 until November 8, 2020. According to the Ministry of Education, this decision represents an extension of the pre-planned half-term holiday for the first term, beginning on November 2, 2020 and ending on November 4, 2020. Following this, two ministerial circulars[8] on assessment and evaluation in elementary, pre-secondary, and secondary education have been released. In the ministerial circular number 2021-10-12 dated February 12, 2021,[9] exceptional measures were also discussed. Both propose combining the second and third terms of the school year 2020/21 into a single assessment period lasting from January 4, 2021 to the conclusion of the academic year and eliminating the second term half-holiday scheduled for February 4 to February 7, 2021.

Hygiene measures and vaccination campaigns

To ensure the safety of students and their teachers upon school reopening in September 2020, students attended schools on alternate days to avoid crowded classes. Some hygiene measures such as spacing, regulations wearing masks, ventilation, and disinfection were implemented. On March 7, 2021, and in order to strengthen prevention measures and the application of the appropriate health protocol, the Ministry of Education, with the support of UNICEF and funding from the 'United States Agency for International Development' (USAID), launched a large distribution operation of cleaning and disinfection kits for all 6,102 schools in Tunisia (primary schools, pre-secondary, and secondary schools), benefiting approximately 2,100,000 students (UNICEF, 2021c). Schools were also given 8,630 contactless infrared thermometers

and multiple printed materials (1 million flyers, 170,000 posters, etc.) with COVID-19 response tips.

In May 2021, the government prioritized vaccinating primary and secondary school teachers and teachers over the age of 50 and/or with comorbidities (L'Économiste Maghrebin, 2021). Before the start of the school year in August 2021, the Health Ministry began giving COVID-19 vaccines to students aged 18 and up and school staff. Students primarily targeted by the vaccination were mostly Baccalaureate candidates and those under the age of 18 with chronic diseases. In collaboration with the Ministry of Education, the Ministry of Health organized coronavirus vaccination campaigns in high schools from October 7 to 14, 2021. The goal was to vaccinate students aged 15 and up who had not yet received a dose. In December 2021, all students (15 years and older) were eligible for the COVID-19 vaccination. Teachers and school staff must present the vaccine pass to access schools after the winter holidays. As of December 22, 2021, the vaccine pass became mandatory for all without exception, in accordance with the Presidential Decree No 1/2021 of October 22, 2021[10] (Tunis Afrique Presse, 2021a).

7. Challenges during the pandemic

When faced with a crisis, the intensity of policy change made by actors is dependent on whether that crisis is exogenous or endogenous, and "Covid-19 thus constituted a strong and multidimensional shock with sufficient destabilization and disruptive capacity to evolve into some form of paradigmatic and path-departing policy change" (Zancajo, Verger & Bolea, 2022, p. 113). The exogenous changes "can alter educational policy by changing the conditions in which education is delivered and by generating new educational problems" (ibid.). For Tunisia, the pandemic forced a change in the conditions of delivery and exposed problems. The intensity of the proposed solutions did not match the intensity of the policy changes during the lockdowns. In a practical sense, Tunisia did not actually switch from face-to-face learning to remote learning in primary, post-secondary, and secondary schools. In fact, there were different communications from the Ministry of Education, and the different measures taken regarding distance learning were experimental. The UVT, while being offered as a resource to families, is a resource only; the Ministry of Education committed to making its expansion a priority (Agade, 2020), but this is of little use to schools and families that do not have access to the Internet, and thus this 'priority' becomes optional to use. The building up of actual resources on the platform was left to teachers, and as of January 2022, the platform no longer appears to be supported. The Ministry also targeted a certain satisfaction of public opinion in the stressful period of the pandemic. In line with the global trend, Tunisian students' and parents' attitudes

towards distance learning showed a preference for traditional face-to-face learning. With around 50% of the households in Tunisia estimated to have both a computer at home and be connected to the Internet, the Ministry could not make distance learning mandatory. The general disinterest of Tunisian students in online learning is explained not only by the fact that it is not obligatory but also by the lack of incentives as they are assessed only for the face-to-face courses. As a consequence, students in Tunisia may experience a considerable learning deficit. We group the challenges of distance learning in Tunisia into three areas:

1. Shortage of digital media equipment, lack of Internet service, and technical problems;
2. Unequal economic opportunities and
3. Unfinished learning.

The Ministry of Education conducted a mandatory online survey about distance learning, in which 1,837,314 students from public schools participated (Ministry of Education of Tunisia, 2020). The online survey conducted in early September 2020 had to be completed by the students and their parents before proceeding with their online enrollment (the online enrollment is also mandatory for all students in primary, pre-secondary, and secondary schools in the public sector). The survey is divided into two sections. One is for the parents, while the other is for the students. Parents were asked about home resources that support e-learning, whether or not their children continued learning (via hard copies provided by the school, recorded lessons on virtual classrooms, or television lessons, etc.), their preferences for the different types of learning for their children (face-to-face, remote learning, and hybrid learning, etc.) and the main problems that children encountered when they had some sort of e-learning.

Table 1: Percentage of students in Tunisia with no digital connectivity and who did not follow any remote learning across educational levels

	No device	No Internet service	No remote learning
Students in primary schools	71%	73%	93%
Students in pre-secondary and secondary schools	49%	60%	89%

Source: Ministry of Education of Tunisia (2020).

The students responded to questions on home educational resources, such as the availability of any media equipment (computer, Internet connection re-liability, or tablet, etc.). They were also questioned about the difficulties associated with remote

learning and if they had access to any kind of e-learning during the school closure. The number of respondents were distributed as follows: 946,781 students in primary and 890,533 in pre-secondary and secondary schools. The survey findings made public in October 2020, revealed that 93% of pupils in primary schools and 89% in pre-secondary and secondary schools did not participate in any online learning (see Table 1).

Shortage of digital media equipment, lack of Internet service and technical problems

One of the biggest challenge students face regarding online learning is the shortage of equipment and Internet connection. As shown in Figure 2, students in Tunisia (across all educational levels) show higher digital connectivity (i.e., access to both a device and the Internet) than other low-middle-income Arab countries, including Algeria, Egypt, and Morocco.

However, this rate (around 40%) is still low and shows that many students in Tunisia were likely excluded from ongoing learning opportunities. The figures for the percentage of students with Internet access are not optimistic for remote learning. Students in lower grades, in particular pre-primary and primary, were more likely to be excluded from remote learning than those in higher grades. The Ministry of Education's survey shows that 71% and 49% in primary and pre-secondary and secondary, respectively, do not have any device for learning. Moreover, the lack of Internet connection impedes distance learning where 73% and 60% of students in primary and pre-secondary and secondary, respectively, do not have an Internet connection (see Table 1).

Additionally, the data gathered from students show that among those who participated in distance learning, 75% of the primary population and 66% of the pre-secondary and secondary population reported that they prefer hard copy materials from their respective schools instead of electronic resources. In addition, among those who reported taking remote learning, 57% and 52% in primary and pre-secondary and secondary, respectively, declare that they have frequently encountered technical problems. Moreover, another impediment in this context is parents' negative attitude toward remote learning, which may be explained by the low digital connectivity. According to the survey, just 13% and 14% of parents whose children are in primary/pre-secondary and secondary school, respectively, have shown a particular preference for remote learning for their children. In comparison, 53% and 48%, respectively, of parents in the same grades prefer face-to-face learning (see Table 2).

Figure 2:   Digital connectivity across educational levels in selected Arab countries
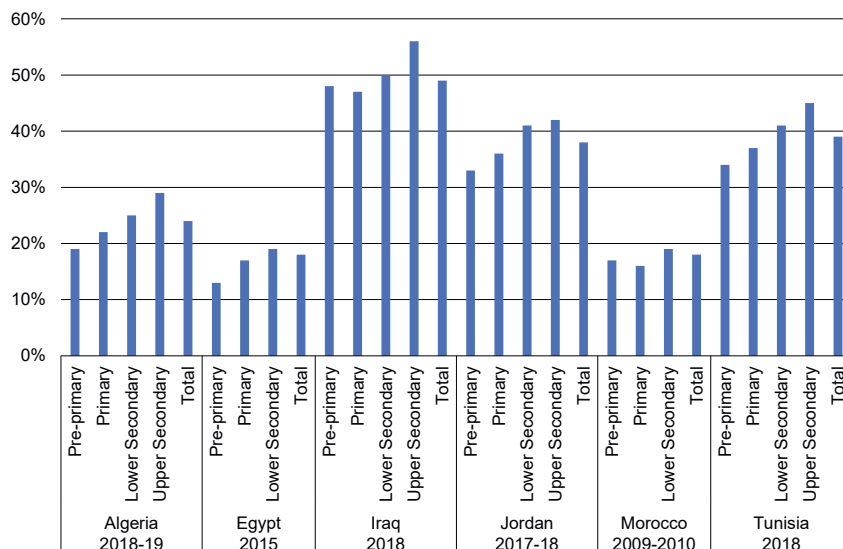
Source: UNESCO, UNICEF & the World Bank (2021, p. 25).

Table 2:   Percentage of parents' preference in Tunisia regarding the different forms of learning for their children

	Face to face		Distance learning		Hybrid learning	
	Primary	Pre-secondary and secondary	Primary	Pre-secondary and secondary	Primary	Pre-secondary and secondary
Parents' preference regarding the forms of learning	53%	48%	13%	14%	34%	38%

Note: Parents were asked the following question: "Under exceptional health conditions, would you prefer for your child (a) Face-to-face education, (b) Distance learning, (c) Hybrid learning?"
Source: Ministry of Education of Tunisia (2020).

Unequal economic opportunities

School closures may increase inequality between low- and high-achieving students (Grewenig, Lergetporer, Werner, Woessmann & Zierow, 2021) and between chil-

dren from different family backgrounds (European Commission, 2020; UNESCO, 2020). Children from low-income households generally live in precarious housing conditions, and they are less well-equipped in terms of technological devices both in numbers and quality, making homeschooling difficult (Van Lancker & Parolin, 2020).

The PISA 2015 data collected for 5,375 15-year-old students enrolled in high schools shows that students in the poorest wealth quintiles are the most disadvantaged in terms of possessing a computer for schoolwork and in terms of having a reliable Internet connection at home (see Figures 3 and 4).

Figure 3:   Students' possession of a computer for schoolwork according to wealth quintiles in Tunisia
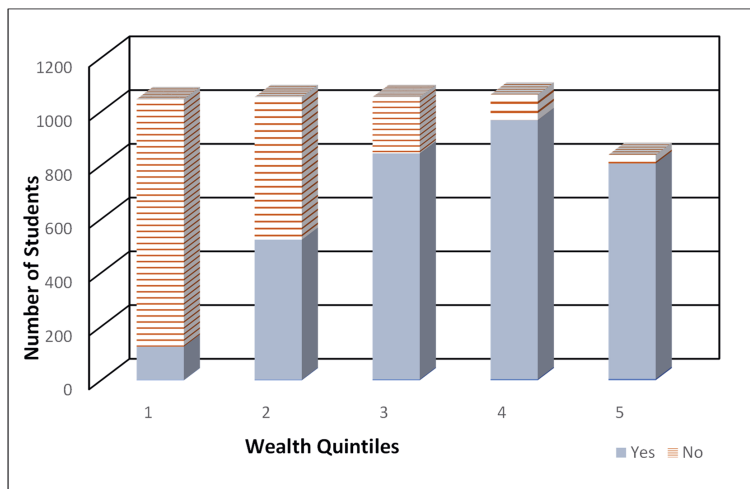

Note: PISA 2015 data can be downloaded from https://www.oecd.org/pisa/data/
The Y-axis indicates the number of students in each wealth quintile. The X-axis indicates the wealth quintile (the first quintile corresponds to the 20% poorest and the fifth quintile corresponds to the 20% richest).
Source: Authors' creation based on PISA 2015 data.

The lack of access to computers/Internet-capable devices is indicative of a deeper issue of economic inequality within Tunisia, heavily inflamed by the pandemic lockdowns. The World Bank estimates that income inequality jumped from 37 to 39.5 due to the pandemic (UNICEF, 2020). The Carnegie Institute estimates that "the percentage of poverty increased from 14 to 21 percent" in 2020, and "the unemployment rate increased from 15 percent in Q1 2020 to 17.8 percent in Q1 2021" (Dridi, 2021, para. 3). UNICEF (2020) notes that Tunisia drifted further away from SDG 1 during the lockdowns and that child poverty is now 50% higher than adult poverty. Child

poverty only enhances the struggles of primary and secondary students and makes them that much more likely to forgo virtual schooling, especially if that virtual schooling is not a mandate. The widespread economic inequality, combined with the government's feeble efforts to address that inequality during the lockdowns, amplified an educational crisis.

Figure 4:   Link to Internet connection in the students' home according to wealth quintiles in Tunisia

Note: PISA 2015 data can be downloaded from https://www.oecd.org/pisa/data/
The Y-axis indicates the number of students in each wealth quintile. The X-axis indicates the wealth quintile (the first quintile corresponds to the 20% poorest and the fifth quintile corresponds to the 20% richest).
Source: Authors' creation based on PISA 2015 data.

Unfinished learning

Between March 2020 and June 2021, schools in Tunisia were closed for sixteen weeks, with an essential lightening of the curriculum during the academic year 2020/21. Even though the school closure was much shorter in terms of weeks than the MENA average of twenty-five weeks (Figure 5), the resulting learning loss may have an impact on an entire generation of children, particularly the most vulnerable learners, including those with disabilities, if adequate measures to compensate for the learning loss are not put in place.

Figure 5:   Duration of school closures (in weeks) on average in MENA (March
             2020 to June 2021)

Country	Weeks
Kuwait	47
Syrian Arab Republic	44
Saudi Arabia	40
Yemen, Rep.	37
Iraq	32
Qatar	30
Egypt, Arab Rep.	30
Iran. Islamic Rep.	28
Djibouti	27
MENA Avg	25
Iraq (KRI)	24
Oman	22
Lebanon	22
West Bank and Gaza	21
Libya	20
Bahrain	20
Jordan	18
Tunisia	16
United Arab Emirates	15
Morocco	14
Algeria	7
Sudan	1
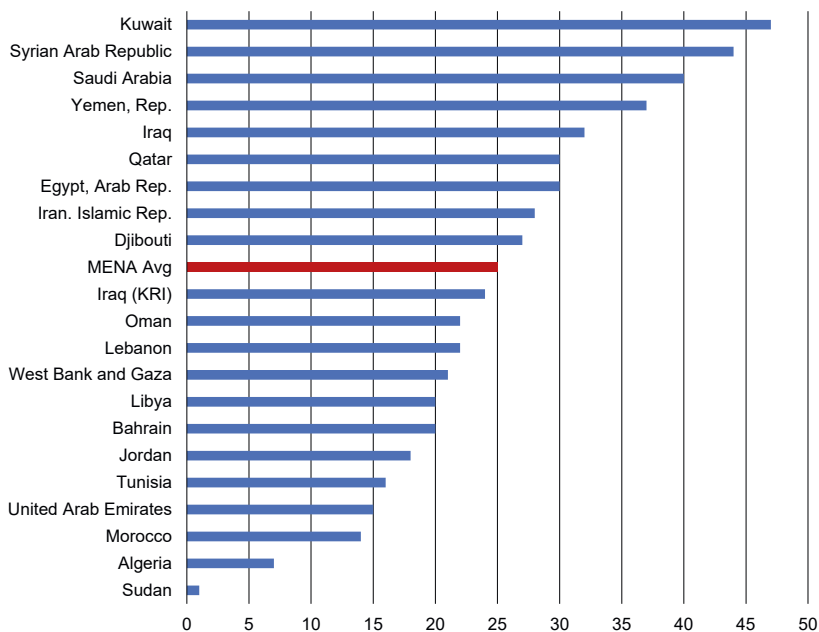
Source: UNESCO et al. (2021, p. 19).

Globally, the combination of the stress of the pandemic and the abrupt switch to
online learning has left students overall preferring face-to-face instruction to remote
learning (Butt, Mahmood, Saleem, Rashid & Ikram, 2021), which unfortunately is
not possible during the lockdown and thus leads to higher instances of interruption
of learning.

During the COVID-19 pandemic, the Arab Barometer's Wave sixth, the largest
publicly available Arab education survey, was conducted in seven Arab countries
between July 2020 and April 2021 in three rounds to capture the changing sentiments
of citizens during the COVID-19 pandemic (Arab Barometer, 2021a). The survey
was conducted in Tunisia with a sample composed of 3,208 respondents (ibid.). Na-
tionally representative mobile phones surveys were fielded. The survey lasted ap-
proximately 25 minutes, with most of the questions closed-ended (Arab Barometer,
2020a, 2020b, 2021b), meaning that respondents picked the response option that
most closely matched their view. The survey revealed that many Tunisian families

are frustrated by incomplete learning due to this unnecessary interruption: 47% of respondents feel the impact of the COVID-19 epidemic on children's education has been extremely negative. In comparison, 27% believe it is moderately negative.

With around 50% of the households in Tunisia estimated to have a computer at home and are connected to the Internet (see Table 3), the Ministry of Education could not make distance learning mandatory. The total disinterest of Tunisian students in online learning is explained not only by the fact that it is not obligatory but also by the lack of incentives as they were assessed only for face-to-face courses.

Table 3:   Households with computers and Internet connection in Tunisia (%)

	2017	2018	2019
Percentage of households with computers at home	47.1%	47.5%	52.1%
Percentage of households connected to the Internet	44.5%	46.1%	52.1%

Source: Institut National de la Statistique (2021).

When children are unable to attend school, they miss out on the opportunity to acquire knowledge and may forget what they have already learned, resulting in lower average learning levels for countries and, eventually, disengagement and dropout (Ardington, Wills & Kotze, 2021; Angrist et al., 2021; Azevedo, Hasan, Goldemberg, Iqbal & Geven, 2020; Gustafsson & Nuga, 2020; Kuhfeld et al., 2020). If students continue to fall behind in the curriculum, un-remediated learning deficits may accumulate over time (Kaffenberger, 2020). To quantify the learning deficits and their impacts on future earnings, UNESCO et al. (2021) released COVID-19 simulations for the MENA region based on their modeling of the potential impact of school closures on several learning outcomes, including learning poverty, the percent below minimum proficiency on PISA, and lifetime earnings.[11] The study's main objective is to assist Ministries of Education, critical national stakeholders, and development partners in advocating for and planning evidence-based recovery strategies to mitigate potential learning losses caused by COVID-19 school closures while combating learning poverty that existed prior to the crisis.[12] Three simulation scenarios were developed. In the optimistic scenario, country-level school closures were observed. The effectiveness of government-initiated mitigation measures (such as remote learning) is high and partial closures are assumed to affect 50% of the student population. Under the intermediate scenario, country-level school closures were observed. Mitigation measures have a middle level of effectiveness, and partial closures are assumed to affect 75% of the student population. Finally, under the pessimistic

scenario, country-level school closures were observed. Mitigation measures have a low level of effectiveness, and partial closures are assumed negligible and are treated as a complete closure (UNESCO et al., 2021). Based on our previous analysis, the pessimistic scenario applies more to Tunisia than the other two. In this case, the results show (see Table 4) that the pre-COVID learning poverty estimate in Tunisia (used as a baseline for the simulation analysis) suggests that 65.3% of children were either out-of-school or unable to read and understand a simple text by age ten. We argue that this percentage will rise to around 77% based on these simulations.

Unlike the measurement of learning poverty, which focuses on achievements at the primary level, the analysis of education proficiency based on PISA focuses on student performance for 15-year-olds, who are typically in lower secondary school. The simulations focus on reading proficiency scores and show how children performing below the minimum proficiency (PISA Level 2 or 407.47 points) could potentially change due to school closures and low mitigation effectiveness of remote learning. The percentage of 15-year-olds below minimum proficiency is likely to rise, and the percentage of 15-year-old children scoring below minimum proficiency could rise from 72% to 85.6%, respectively.

Table 4: Learning outcomes and future earnings: Pre-COVID baseline and under the pessimistic scenario in Tunisia

	Baseline	Pessimistic
Learning poverty	65.3%	76.9%
PISA below minimum proficiency	72.0%	85.6%
Present value loss to economy lifetime earnings with adult survival and labor force participation (millions of US$)	-11.456 M	-22.915 M
Present value (PV) loss to lifetime earnings of a single individual (US$)	-11,465	-22,933

Source: UNESCO et al. (2021).

The loss of learning can have a negative impact on lifetime earnings and single individual earnings. Under a pessimistic scenario, the simulations project that the current cohort of learners could lose approximately US$ 22,915 million of lifetime earnings (at the present value in 2017 purchasing power parity). For a single individual in Tunisia, these projected losses translate to close to US$ 22,933 (see Table 4).

8. Conclusion and discussion

In this paper, we shed light on how the COVID-19 crisis affected primary and secondary education in Tunisia and how the country has responded to the crisis in the education sector. A government-level survey conducted in early September 2020, in which 1,837,314 students from public schools participated, showed that more than 80% of the respondents in basic and secondary education did not participate in any online learning (Ministry of Education of Tunisia, 2020). The online survey is part of a larger body of evidence that there are many barriers to distance learning in Tunisia. However, instead of investing in children and their education, government budgets are being hollowed out by a recession and the diversion of public spending to health care and economic recovery. While notable efforts have been made to ensure the smoothest possible adaptation to distance and online teaching, numerous challenges persist, not the least of which is poor implementation and missed opportunities of technologies. The shortage of digital equipment, the drought of access to the Internet, and the technical problems make remote learning difficult for many students. In addition, the high cost of access to technology makes it difficult for children from poor backgrounds to access remote learning. The learning losses attributable to COVID-19 may not end with the pandemic but will likely also have long-term implications for the affected cohorts and are likely to exacerbate existing inequalities. Two academic years after the pandemic, the Tunisian government has not planned any strategy to address this learning deficit.

We can take away many lessons for the pandemic to better prepare educational systems for shocks and educate our students better. However, we cannot forget the lasting effect of the pandemic on our children as it threatens to rob them of their learning, and its effects, if not handled correctly, can lead to the further exploitation of many children. Many children can be at risk for child labor, violence, and exploitation without schooling. When the pandemic forced the closing of schools worldwide, many nations made an effort to support a formal switch to remote learning. However, Tunisia did not formally switch from face-to-face learning to remote learning in primary, pre-secondary, and secondary school, instead asking schools to offer it to students who could participate. The Ministry's ICT arm, CNTE, made efforts to support students with the UVT virtual learning platform but made no notable efforts to reach those in the rural coastal areas who did not have access to remote learning.

Despite a lack of formal studies in this early stage of a 'post-pandemic' Tunisia, there is evidence that there are many continuing barriers to distance learning in Tunisia. The online survey conducted by the Ministry of Education has demonstrated the lack of faith Tunisian students have in the concept of distance learning due to inequalities (Ministry of Education of Tunisia, 2020). Data from UNICEF (2020)

only support the idea that "the closure of schools for six months, combined with little to no access for the majority of children to distance learning, despite the Government's efforts in this regard, will most likely further deteriorate learning outcomes" (p. 1). These barriers can hamper or completely prevent the utilization of distance learning. The shortage of digital equipment, access to the Internet, the high cost of access to technology, and the technical problems make remote learning difficult for many students.

Moreover, it is crucial to change students' attitudes and behaviors about using digital resources. Students' preference for hardcopy materials makes it challenging to transition to digital materials in a short period. Even though research studies show that most students prefer hardcopy materials to softcopy materials (Akaadom, Takramah & Anagbonu, 2020; Looi & Chen, 2010), we recommend that teachers incorporate digital technology into their teaching by making course materials available in digital formats for students to access for their studies, a question of familiarizing them with electronic resources. Furthermore, primary school students may lack fundamental technology skills and may lack a computer and digital platform culture, which may impede their ability to continue learning. Introducing digital literacy at an early age is essential as it makes them responsible for using technology.

Remote learning ensures parental support if it is properly implemented. When students are required to remain at home and navigate the digital learning landscape on their own, parents need good parenting skills and a moderately high level of education, good computer knowledge, and digital literacy. Parents with lesser levels of education often feel unable to assist their children in studying specific courses and using the technology, which may explain their preference for face-to-face learning over remote learning. Promoting adult digital literacy is essential as it helps them respond to society's challenges. Moreover, the perceived effectiveness of online learning is vital in a stressful time such as a pandemic. Additionally, quality of the platform predicts performance. In an international study on online learning platforms during the pandemic, Butt et al. (2021) found that overall quality correlated with user satisfaction and predicted the ability to complete tasks, the student's performance on those tasks, and thus the continued use of that technology. It is not just a matter of ensuring that the virtual platform is available to most students, but also ensuring that the user experience promotes student learning effectively, especially if the platform is optional to use and reliant on the populace to seek out and make use of. There are, as of yet, no formal studies on the effectiveness or quality of television as a remote learning platform in Tunisia, but preliminary clues are not promising. As mentioned before, it was an online platform for ICT that was hastily repurposed to host online learning in masse. Combined with the lack of access, this may explain (not discounting the many other probable factors) part of why the 2020 ninth-year exam scores

were low and experienced an increase in fraud. However, the preliminary 2021 results were that scores had improved, and instances of fraud lessened (Tunis Afrique Presse, 2021b).

Access to technology makes distance learning simpler for the wealthy and more difficult for the poor, contributing to the widening gap between students from affluent origins and those from underprivileged ones. This is a problem worldwide:

> The rapid shift to the digital sphere during school closure periods highlighted major differences in access to digital technologies, depending on countries' level of income, but also with regard to the different social groups within countries. The stark digital divide added to and amplified the social divide, increasing inequality and directly impacting the distribution of learning losses among social groups during school closures. (Bozkurt & Sharma, 2020; as cited in Zancajo et al., 2022, p. 116)

As a result, increasing access to the Internet and other digital solutions for all children would be a critical long-term goal for reducing learning vulnerabilities. It is a role that the state must play in the ongoing digital age restructuring of schools, and it will not become more accessible when the pandemic has become history. Douse and Uys (2020) argue that remote learning during the pandemic is only part of the larger body of evidence that "an entire overhaul is called for, moving above AI [artificial intelligence] and beyond ICT, embodying and synergistically integrating contemporary technology in its connectivity, organisation, curriculum content and research, and in innovation, learning methods and management" (para. 9). This is not possible when infrastructure issues do not allow for this 'overhaul.' Tunisia committed to improving its virtual education space, but it must make sure that space is available to most, if not all, of its student populace, or else this is simply a half measure, and will only decrease the effectiveness of its own schooling in a post-pandemic world. Moving forward:

> Not only in these pandemic times but forever onwards, there need seldom be whole class group work. Weekly one-to-one face-to-face safe meetings with individual teachers and small group interactions as needed will be sufficient to supplement and sustain the predominantly online learning experience. This is already the world within which young learners live. (Douse & Uys, 2020, para. 11)

The move to online learning that has been implemented worldwide in the wake of the pandemic should not be conflated with 'effective' online teaching as it was, in most cases, haphazardly organized and executed, and should be differentiated as 'emergency remote teaching' (Hodges, Moore, Lockee, Trust & Bond, 2020).

It is worth noting that Tunisia has not implemented remedial programs since the COVID-19 school closures. The country has not planned to take any steps to measure learning losses in primary, lower secondary, and upper secondary levels. In addition, there has been no extension for the school year 2021/22 planned, and no curriculum

adjustments have been announced. Most children have lost substantial instructional time and may not be ready for age- and grade-appropriate curricula before the pandemic. Therefore, remedial instruction is essential to reduce long-term learning losses. Tunisian decision-makers should develop a strategy to address this learning deficit.

Although government policy measures taken to ensure learning continuity were not effective, they have nonetheless shown that deploying distance learning strategies requires developing an effective environment for distance learning, including schools, teachers, students, and their parents. On the one hand, remote learning could not reach all students. On the other hand, the preference for traditional face-to-face learning due to digital illiteracy and low computer knowledge makes it challenging to implement effectively. Now, what is the way forward for the Ministry of Education? More resources must be invested in the necessary digital, pedagogical, social, and emotional competencies to succeed in remote learning. A clear and appropriate plan to digitalize the learning and teaching process must be developed and discussed with different stakeholders.

Notes

1. There are three terms throughout the school year (first, second, and third). The first lasts for three months. The second and third terms run for two and a half months. Each term, students are evaluated based on the content covered in that term.
2. On December 22, 2021, the Tunisian government made the vaccination pass compulsory according to the Legislative Decree of October 22, 2021 (see: https://legislation-securite. tn/fr/law/105101).
3. In each governorate in Tunisia, there is a government run Pilot pre-secondary school. Entry to these Pilot schools is based on the criterion of having a score of 15 or higher out of 20 in the national examinations.
4. In each governorate in Tunisia, there is a government run Pilot secondary school. Entry to these Pilot schools is based on the criterion of having a score of 15 or higher out of 20 in the national examinations.
5. On October 23, 2011, Ennahdha won a plurality of the first post-Jasmine Revolution elections vote for the National Constituent Assembly (NCA). They formed a ruling coalition called the Troika – an alliance between Ennahdha, Ettakatol (the Democratic Forum for Labor and Liberties), and El Mottamar (the Congress for the Republic) – through which it ruled the country under Moncef Marzouki as President (from 2011 to 2014) and Hamadi Jebali as Prime Minister (from December 2011 to March 2013).
6. Institut National de Bureautique et de Micro-Informatique (INBMI) was previously named Bourguiba Center for Microcomputing (CBMI – Centre Bourguiba de Micro-Informatique), which was established in October 1984 by Mokhtar El Atiri, founder of the Tunisian National School of Engineering (Ecole Nationale d'ingénieurs de Tunis).
7. The different archives can be found on the Ministry of Education website. They are all in Arabic: http://www.education.gov.tn/?lang=fr

8. Ministerial circular 2020-10-62 (November 2, 2020) for the assessment and evaluation in primary education and ministerial circular number 2020-10-63 (November 3, 2020) for the assessment and evaluation in pre-secondary and secondary education.
9. Ministerial circular: http://www.administration.education.gov.tn/2021-02-12/12102021.pdf
10. For the Decree, see: https://legislation-securite.tn/fr/law/105101
11. See UNESCO et al. (2021) for the different learning outcomes used their corresponding definitions and how to calculate them.
12. Note that the results are simulations and they do not use actual data on learning losses or mitigation effectiveness, both of which are currently limited, particularly in MENA countries.

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