RESEARCH ARTICLE

COVID-19 and Educational Resilience in Africa: How School Closure Revealed Countries' Educational Conditions

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ABSTRACT

This study examines school closures in Africa during the COVID-19 pandemic as a reflection of countries' educational conditions. Using an interdisciplinary approach that combines the sociology of crisis and decision-making, it focuses on two leading indicators: The timing and duration of school closures concerning the emergence of the coronavirus. We then correlate these factors with each country's specific pandemic and educational context. Our data collection involved an online documentary analysis and leveraged insights from two webinars on African responses to COVID-19, conducted in March and June 2020, in which we participated. Through a categorical analysis, we classify the 54 African nations into five groups according to how they handled school lockdowns during this pandemic: Resistant, proactive, reactive, post-active, and passive, demonstrating that the modalities of their school closures were not neutral. Our analysis reveals the detailed nuances of the educational conditions in these countries, providing valuable insights into their crisis management policies and governance. It offers perspectives to assess educational resilience in major crises and deepens the relationship between educational conditions and responses to these crises.

Introduction

The COVID-19 pandemic, which reached Africa on February 14, 2020, took only 46 days to spread to almost all 54 African countries [1]. According to Spaull et al., this health crisis posed immense challenges to the educational systems of these countries, forcing them to implement drastic measures to contain the virus's spread and safeguard public health [2,3]. Among these measures was the schools' closure, which Sultana et al., define as a decision by state authorities to suspend face-to-face academic activities on school campuses temporarily [4]. From February to July 2020, Africa experienced a total and widespread school lockdown within countries during the peak of COVID-19 (Human Rights Watch, 2020). Except for Burundi and Cape Verde, all African countries had, in various ways, interrupted in-person educational activities during the pandemic's most critical period – February-July 2020 [5,6].

Several studies have closely examined school closures concerning education, evaluating their effects and impacts [2,7]. For instance, Plumelle et al., highlights that discontinuing in-person education led to significant learning losses, particularly among learners from disadvantaged backgrounds [8]. Additionally, Nwokeo-

cha et al., emphasizes how school closures exacerbated educational disparities already widespread on the continent, while other studies focus on their impact on learners' mental health [9]. In this vein, Chaney and Chippaux associate social isolation, pandemic-related uncertainty, and the disruption of educational routines with a notable increase in symptoms of stress, anxiety and depression among these learners [10-13]. Furthermore, as Béché and Igodoe et al., show, the transition to distance learning, imposed by these protective measures during COVID-19, posed significant challenges for educational stakeholders in teacher training and adapting pedagogical methods [14,15].

However, these studies primarily address school closures during COVID-19 in Africa from a deterministic perspective, thereby focusing on the identifiable and specific consequences of this preventative measure against the coronavirus on education. Although this approach is relevant for understanding the immediate effects of this measure, it may overlook the deeper dimension of school lockdown as a revealer of a country's educational conditions. In other words, it risks neglecting the structural educational dynamics hidden behind school closures and disregarding valuable lessons from this analysis, which is nonetheless likely

to provide insights into the comprehensibility of educational conditions. Besides, many studies Jack et al., and Ndejjo et al., recommend interpreting school closures in Africa during COVID-19 in terms of outcomes and lessons, especially as they deal with countries' educational conditions [16,17].

By educational conditions, we refer to the environmental, social, and organizational factors related to the school that influence and shape the teaching and learning processes [18,19]. According to Poolton et al., and Bourion-Bédès et al., these conditions play a significant role in determining the effectiveness with which learners can achieve their educational objectives in a given context [20,21]. Morency even goes so far as to link the conditions that determine education to the sustainability of learning, presenting the former as a tool capable of measuring the latter's effectiveness in a decision-making context [18].

As Renaud points out, if educational conditions thus determine learning, the decisions made in a crisis context can also reveal the strengths and weaknesses of these conditions [19]. Macamo describes a crisis as a tension and emergency that disrupts everyday life, involving a conscious decision to act [22,23]. In such circumstances, decision-makers sometimes depart from their expertise to rely on factors that break the usual patterns of thought and action [24]. For us, such a decision-making mode is likely to silently express hidden realities behind the performative figures of education [25]. By reacting in this way to COVID-19 challenges in education, most African countries hastily translated into their contexts the protective measures conceived and implemented in the Western context, a choice that Macamo finds curious, thus suggesting that whatever the sophistication of a response to nature, it continually exposes an unidentified weakness [22,23]. In this regard, as argued by Roux-Dufort and Peretti-Watel, decisions made in a crisis context can only reveal the weaknesses of a society [26,27].

From this perspective, we aim to examine school closures in Africa during the COVID-19 pandemic, approaching them at the intersection of the sociology of crisis decision-making [22-25]. Our objective is to demonstrate how the way African countries managed school lockdowns during this period reveals the strengths and weaknesses of their educational conditions. To illustrate this point, we consider three key indicators of school closure: The time lapse between the appearance of COVID-19 in a country, the decision to close schools, and the duration of this closure. According to Koselleck and Lagadec, the temporality of a reaction to a crisis reveals the foundations of a society [28,29]. This approach reveals that, rather than being a simple response to COVID-19 in the education sector,

this measure has laid bare the level of vulnerability or resilience of education conditions in African countries. We assume that there is a link between a country's degree of educational resilience and how it has proceeded with the closure of its schools, particularly in terms of the responsiveness and duration of this closure. We emphasize that school closure during the crisis is a important indicator of the level of performance of African countries' education systems, which can then be categorized accordingly.

Materials and Methods

To support the perspective above, we collected and analyzed our data based on two pillars. The first pillar consisted of online documentary research on school closures in the context of COVID-19 in Africa. This approach, centered on web exploration, is motivated by the overabundance of digital information on COVID-19, which, according to Breyton et al., Faure and Klingelhofer et al., is among the topmost documented phenomena on the web in 2020 [30-32]. We used Google Engine as our primary source of information. For French-speaking countries, we used the following query: COVID-19 OR coronavirus AND [country name] AND "closure of schools OR classes." For English-, Portuguese- and Arabic-speaking countries, we used the following one: COVID-19 OR coronavirus AND [name of a country] AND "school closure OR lockdown." We, thus, collected data on school closures in the 54 African countries, which we supplemented by exploring the UNESCO database and Wikipedia, from which we targeted information on school closures in Africa during COVID-19.

The second pillar of our approach consisted of two webinars on African responses to COVID-19 in the education sector, in which we participated. The first took place on Team on March 4, 2021. It marked the launch conference of the imagine cole project, a digital platform of learning resources implemented by UNESCO in ten French-speaking sub-Saharan African countries [33]. During the videoconference, education ministers from Benin, Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Guinea, Mali, Niger, Senegal, and Togo shared their countries' experiences of school closures due to COVID-19. As one of the participants, we took systematic notes on all the papers presented. The second webinar on ZOOM took place on July 13, 2021, and was organized by the KIX Africa 21 Center. During this session, African academic actors, including ourselves, who had played a central role in their countries' educational continuity, shared their experiences, from which we also picked up information on school closures.

We combined all these data on school closures in Africa during COVID-19 into a single file. Their re-reading and

processing enabled us to carry out a double correlation. The first level of this correlation was to link these data to their contexts, particularly the African governments' attitudes in relation to COVID-19 and the scale of the pandemic in terms of first infected cases, deaths, and infected people. Its second level was to compare them with performance indicators for the education systems of different African countries, such as learning performance and the overall quality of their education systems.

Results and Discussion

The cross-analysis we did helped us classify African countries according to their approaches to school closure during the pandemic into five distinct categories: Resistant (or defiant), pre-active, reactive, post-active and passive.

Defiant countries

The resistant or defiant group includes Burundi and Cape Verde, who left their schools open during the pandemic [34,35]. We define them as defiant or resistant because of their reluctance to apply global health guidelines on their territories, particularly school closures. Their extreme opposite is Uganda, which reopened its schools on January 10, 2022, almost two years after closing them, making it the country with the most extended COVID-19-related school closure worldwide [36]. There are at least two reasons why Burundi and Cape Verde did not opt to close their schools during the pandemic.

The first reason is their relationship to the pandemic. Despite their geographical differences-landlocked for Burundi and insular for Cape Verde-these two countries were among the last in Africa to be affected by the virus, with Lesotho recording its first case on May 13, 2020, at least six weeks after them [35]. Cape Verde and Burundi recorded their first cases on March 20 and 31, 2020, respectively, more than 40 days after the virus's first appearance on the continent, on February 14, 2020, in Egypt. This had probably given them considerable time to observe other countries' health and educational strategies and experiences. The lessons learned from these observations likely influenced their decision to keep their schools open, especially as they are among the continent's least affected countries regarding virus-related contaminations and deaths. Data from the Africa Center for Strategic Studies and the Reuters COVID-19 Tracker illustrate their relatively low impact from the pandemic. As of January 5, 2022, two years into the pandemic, Burundi reported only 14 deaths and 32,076 infections. Cape Verde had higher figures than Burundi but still managed to keep them relatively controlled, with 353 deaths and 43,567 infections, significantly lower than other African coun-

tries, like Tunisia, which recorded 28,655 deaths and 1,044,426 infections. It is also important to note that Burundi had initially adopted a skeptical stance towards the coronavirus Papillon, 2020 before performing a 180-degree turnaround by putting in place measures such as border closures, screening, quarantine, vaccination, and health passes without, however, closing schools [37,38].

The second reason lies in the resilience of educational conditions in these two countries. According to the APPRENDRE program, Burundi ranks among the top-performing African education systems in various PASEC rankings. Wathi highlights that since 2014, Burundi has made significant strides in education: Its pupils have consistently outperformed their French-speaking African peers in reading and mathematics, achieving high national performance levels and reducing disparities between the best and least advanced students [35]. This progress has positioned Burundi among the 42 countries worldwide with the most resilient educational performance. Similarly, Cape Verde demonstrates a remarkable educational robustness in Africa. According to the World Economic Forum on Education, which assessed 140 countries globally, including 38 in Africa, concerning competency-based educational development, Cape Verde ranks among the top ten African education systems [39]. This position aligns with the observations made by Ferreira, who highlights Cape Verde's commitment to educational reform and investment [40]. The exceptional educational resilience displayed by these two countries undoubtedly bolstered their decision to keep schools open despite the pandemic.

To sum up, the decision of Burundi and Cape Verde to keep their schools open during the pandemic, while Africa and the world "confined" theirs, was encouraged by the convergence of three factors: The delayed onset of the coronavirus in their respective territories, the low rates of COVID-19 contamination and fatalities, and the resilience of their educational systems. Notably, both Burundi and Cape Verde are among the eighteen African countries identified by UNICEF as well-prepared and capable of ensuring safe and effective education continuity following the pandemic's peak [41].

Pre-active countries

The category of pre-active countries comprises eight nations that implemented preventive measures by closing their schools well in advance of the emergence of the coronavirus within their borders. These countries merit the designation of "pre-active" owing to their proactive and anticipatory response to the threat of COVID-19, taking swift action to shutter their educational institutions even before the pandemic directly

impacted them. They include Uganda, Guinea-Bissau, Botswana, Mali, Malawi, South Sudan, São Tomé and Príncipe, and Comoros.

Uganda and Guinea-Bissau pre-emptively suspended classes four days (COVID-19 onset: March 22; school closure: March 18) and six days (COVID-19 onset: March 19; school closure: March 25), respectively, prior to the arrival of COVID-19. Mali and Botswana took similar preventive measures, shutting down schools a week before the virus was detected-on March 25 in Mali and March 30 in Botswana. In the case of South Sudan and Malawi, the schools ceased operations 11 and 15 days before their first COVID-19 cases were confirmed on March 20 and March 23, 2020, respectively [42,43]. Meanwhile, São Tomé and Príncipe and Comoros took even more cautious steps, closing schools 16 and 44 days ahead of the virus's emergence in their territories.

Among these nations, Botswana stands out, boasting the sixth-best education system in Africa [39]. Conversely, the other members on this list confront significant challenges related to educational stability and performance [44]. It is reasonable to assume that their decision to close schools early was primarily motivated by concerns regarding the fragility of their social, health, and educational structures. For instance, in his 2020 report, The Association of the Development of Education in Africa (ADEA) highlights significant deficiencies in the education systems of these countries, characterized by issues such as overcrowding, instability, and, notably, severe problems with internal efficiency.

According to Jourde, it is legitimate to question whether Guinea-Bissau's educational system requires a complete reconstruction [45]. Besides, this country bears the scars of 40 years of institutional instability, deficient learning, and some of the lowest academic achievement levels among comparable nations [45]. Similarly, according to a 2020 UNICEF report, Mali presents a nearly identical reality: A literacy rate exceeding 50%, high rates of school dropout and non-enrollment, a shortage of qualified teachers, and a deficient school environment. These factors likely explain the meager rate of educational survival in the country, as noted by the CONFEMEN (2020) Education Quality Observatory. According to the Cross Catholic Blog, Malawi is also grappling with an educational crisis characterized by poor-quality teaching, low primary school completion rates and pronounced reading deficiencies [46]. As for South Sudan, it has been ravaged by almost six decades of near-continuous civil war, resulting in the world's lowest literacy rate and significant institutional fragility in the field of education. Meyerfeld has aptly labeled it an "education black hole" [44]. Finally, even São Tomé and Príncipe do not escape these challenges, having one of the continent's most congested and unequal education systems. Particularly at the primary level, dropout and repetition rates regularly reach 80% [47].

Based on the data above, which underscore the fragile state of educational infrastructure in these eight countries, we can reasonably conclude that their choice to close schools for several days or even weeks before the arrival of COVID-19 was not indicative of the strength or effectiveness of their educational systems. Instead, it was a precautionary and anticipatory measure aimed at minimizing the predicted health risks within their borders, given the vulnerability of their social and educational context. This decision seems to have been influenced by two additional considerations: Firstly, the monitoring of the pandemic's progression in neighbouring countries, and secondly, the recognition of their limited healthcare and educational capacities to contain the effects of COVID-19 if schools as the primary hub of virus transmission, were to remain open.

The countries in the pre-active group were the last to be affected by COVID-19 in their respective geographic regions. For example, the countries closest to São Tomé and Príncipe were already hit by the pandemic in the first two weeks of March: March 6th, 12th and 14th, respectively, for Cameroon, Gabon, and Equatorial Guinea. Probably out of caution, and despite its isolated location, São Tomé and Príncipe closed their schools on March 20th, 16 days before the pandemic arrived on its soil. Likewise, although the Comoros Islands are nearly 300 km from the African coast, they are very close to Mayotte, a French territory affected by COVID-19 as early as March 14, 2020. During this period, France was experiencing severe COVID-19 outbreaks. Cautiously, the Comoros Islands closed their schools 44 days before the coronavirus appeared on their territory.

Similarly, neighbouring countries of South Sudan were already affected by COVID-19 as of March 21, 2020: Democratic Republic of Congo (March 10, 2020), Ethiopia (March 13, 2020); Kenya (March 13, 2020), Sudan (March 13, 2020), Central African Republic (March 14, 2020), and Uganda (March 21, 2020). The country closed its schools three days after its neighbours and fifteen days before the virus reached its soil on April 5, 2020, considering its social, economic, health, and educational fragility resulting from a long civil war. Malawi also took this measure on March 23, 2020, eleven days before the arrival of COVID-19 on April 2, 2020, and two days after the last neighbouring country was affected by the virus: Zambia (March 18, 2020), Zimbabwe (March 21, 2020), Mozambique (March 21, 2020). The same applies to Mali, which, after observing that its neighbours were already infected by COVID-19 (Algeria: February 25, 2020, Senegal: March 2, 2020,

Burkina Faso: (March 9, 2020), Guinea Conakry: March 13, 2020, Côte d'Ivoire: March 11, 2020, Mauritania: March 13, 2020, and Niger: March 19, 2020), closed its schools on March 18, seven days before the virus arrived on its soil.

Botswana, too, closed its schools seven days before COVID-19 reached its soil (March 30, 2020), three days after the last neighbouring country was affected: Namibia (March 14, 2020), Zambia (March 18, 2020), Zimbabwe (March 21, 2020), Angola (March 21, 2020), and South Africa (March 5, 2020). Similarly, after noticing that it's two neighbours-Senegal (March 2, 2020) and Guinea Conakry (March 13, 2020)-were already infected by the coronavirus and had closed their schools, Guinea-Bissau took this measure on March 19, six days before COVID-19 appeared on its territory (March 25, 2020). Uganda, which reopened its schools on January 10, 2022, after two years of closure, had closed them on March 18, 2020, three days after the last neighboring country Tanzania (March 16, 2020) was affected and four days before COVID-19 arrived on its territory.

In summary, the early school closures in these eight "pre-active" countries are correlated with an awareness of the acute vulnerability of their educational conditions. While their decision demonstrates prudent anticipation of the coronavirus threat, it is primarily motivated by the fragility of their social, healthcare, and educational systems, which they likely aim to prevent further deterioration.

Reactive countries

The group of reactive countries includes Rwanda, Zambia, Sierra Leone, Tanzania, Liberia, Gambia, Niger, Chad, and Mozambique. We refer to them as "reactive" because they quickly closed their schools once COVID-19 emerged in their areas. The first three immediately closed their schools on the very day the coronavirus was detected on their soil. Rwanda closed its schools on March 14, 2020, while Zambia and Sierra Leone did so on March 18 and March 31 of the same year, respectively, demonstrating immediate reactivity. As for the six other countries, although their reactivity was slightly delayed, they closed their schools one day after the discovery of the first COVID-19 case within their territories. Niger and Chad suspended their classes on March 20, 2020, while Tanzania, Liberia, Gambia, and Mozambique did so on March 16, 17, 18 and 23 of the same year, respectively.

Whether their reactivity was immediate or slightly delayed, the speed with which these countries responded to COVID-19 by closing their schools reflects various factors specific to their respective contexts. This reactivity does not necessarily equate to high-performing, stable, or resilient educational conditions, particularly considering that many of these countries face educational deficits. For example, in 2021, UNICEF assessed the education sector in the Gambia as deficient quality, "featuring significant bottlenecks" that hinder learning and result in high dropout rates. Similarly, according to reports by Barma Y, Chad and Niger consistently performed poorly in PASEC assessments regarding enrollment and completion of studies [48].

Nevertheless, despite the relative weaknesses in their education systems, these countries had anticipated their "educational confinement" by implementing pedagogical continuity measures even before the appearance of COVID-19. Chad obtained support from Maskott and Canopé of the French Ministry of National Education through the French Embassy in Chad as early as February 2020 to establish an alternative school system in case of school closures due to COVID-19 [49]. This collaboration included the production of tutorials and podcasts by the Canopé network to assist Chadian teachers in distance education. At the same time, Mascott had to provide Chadian students and teachers with an open digital resource bank within one week. Niger adopted a similar strategy in partnership with the World Bank. Furthermore, a teacher distance education initiative has been in development for over five years in both Chad and Niger. During a March 2020 webinar launching the Imaginecole Initiative, the Ministries of Education of Niger and Chad reported that they activated it from March to June 2020 when schools were closed due to COVID-19.

Although limited access to electricity (15% in Niger and 10% in Chad in 2019) and the internet (9.8% in Chad and 10% in Niger in 2019) significantly constrained the reach of these educational continuity measures during the pandemic, they nevertheless demonstrated a certain level of preparedness aimed at mitigating the crisis's impact on education. Therefore, we can interpret these countries' decision to close their schools upon the arrival of COVID-19 on their soil due to their awareness of the potential disasters that the virus could have caused in the absence of action and passivity. As Omtzigt et al., state, they may have felt that their limited healthcare, social services and education resources would not be sufficient to handle the impact of a pandemic [50]. For, at the same time, Western countries, which have the most advanced healthcare and education systems, were experiencing the consequences of COVID-19 in terms of deaths and hospitalizations between March and June 2020. Therefore, the reactivity of Gambia, Niger, and Chad to COVID-19 in terms of school closures can be considered both an indicator of preparedness and a precautionary measure aimed, to the best of their abilities, at addressing the spread of the pandemic within their territories.

As for the reactivity of the six other reactive countries-Liberia, Mozambique, Rwanda, Sierra Leone, Tanzania, and Zambia, it is based on various considerations, although they do not belong to the top ten African education systems, according to the AUF's APPRENDRE program and the World Economic Forum [39]. On the one hand, Rwanda, Mozambique, Tanzania, and Zambia benefit from relatively stable and improved education systems and have widespread alternative forms of distance education [51-54]. Thanks to this relative technical advantage, they likely did not hesitate to close their schools upon the arrival of the pandemic on their territory, knowing that they have relatively relevant means of pedagogical continuity in the event of lockdown [34].

On the other hand, countries like Sierra Leone, Rwanda, Liberia, and Chad have already faced health crises or conflicts. For example, during the 1994 genocide in Rwanda, all schools were closed for over a year [55]. Liberia also closed its schools during the civil war from 1980 to 1997 and during the Ebola epidemic that ravaged the country between 2014 and 2016 [56,57]. The same applies to Sierra Leone, which learned lessons from the civil war (1991-2002) and the Ebola epidemic (2013-2016), during which it completely closed its schools and even Niger [58,59]. These countries' various experiences in managing epidemics or conflicts acted as a reflex, an alert, or conditioning in their decision to reinforce their reactivity to the COVID-19 pandemic regarding school closures.

In conclusion, while the reactivity of these countries may not necessarily indicate a robust and high-performing education system, it may be linked to educational conditions that have faced emergencies such as conflicts and epidemics in their histories. This also highlights their ability to implement reactive measures in response to the pandemic, drawing on their experiences in managing social and educational crises.

Post-active countries

The category of post-active countries includes those that waited several days, weeks, or even months after detecting the first COVID-19 contamination on their territory before closing their schools. In total, 33 African countries maintained a "worrying" time lapse between the appearance of the coronavirus on their soil and the introduction of restrictive measures, including the suspension of classroom teaching. The fact that these countries account for 61% of the continent's total could raise questions about Africa's preparedness, particularly regarding its educational infrastructure, to mitigate the initial impact of the COVID-19 pandemic effectively. In any case, assessing the length of time between the appearance of the virus and the decision to close schools enables us to classify these 33 countries into four distinct sub-groups: Immediate post-actives, slow post-actives, hesitant post-actives, and late post-actives.

Immediate post-active countries

Immediate post-active countries did not lose enough time after the first case of COVID-19 on their soils to enact preventive measures, including school closures. This sub-group comprises six countries: Gabon, Sudan, Mauritius, Kenya, Mauritania, and Somalia. They waited three or four days after the pandemic outbreak to suspend all face-to-face school and academic activities.

These five countries share a common trait, except Somalia, which has proven experience in managing crises that have led to school closures [58]. What they have in common is their educational conditions, which are among the most robust and stable on the continent. For instance, data from the UNESCO Institute for Statistics reveal that Sudan is one of the highest-performing African countries regarding primary to secondary education transition (93.5% in 2018) and retention in the school system (84.6% in 2018). According to Afro Barometer statistics, compiled by Wali Wali et al., Gabon also has an acceptable rate despite shortcomings in education quality [60]. Their data show that Gabon and Mauritania have the best school infrastructure coverage among African countries. Also, Kamil notes that Mauritania made significant progress in education during the 1990s, a disappointing period for Africa overall [61]. Moreover, according to the World Economic Forum two countries in this sub-group-Kenya and Mauritius are among the ten African nations with the best-performing education systems in 2020 [62].

The educational indicators below allow us to understand how the post-activity of these countries, except Somalia, is linked to their decision-making processes and health and education governance. This post-activity promptness and establishment of pedagogical continuity mechanisms can also be attributed to established remote infrastructures in these countries. According to Wagnon, a country with widespread and easily accessible technical components like electricity, the Internet, radio, and television can quickly implement distance learning initiatives during a crisis [63]. The more accessible these components are, the faster the implementation process can be. It's also worth noting that, except Somalia, none of these countries has ever had to deal with a crisis that led to a general shutdown of its schools.

Slow post-active countries

The sub-group of slow post-active countries waited around a week after the detection of the first case of COVID-19 on their territories before implementing barrier measures, including school closures. This group includes nine countries: Ghana, Zimbabwe, Angola, Côte

d'Ivoire, Congo, Djibouti, Lesotho, Benin, and Eritrea.

The first three countries Ghana, Zimbabwe, and Angola suspended all face-to-face school and academic activities five days after the virus outbreak, on March 12 in Ghana, March 21 in Zimbabwe, and Angola. Côte d'Ivoire, Congo, Djibouti, and Lesotho did so after six days, and the last two Benin and Eritrea after precisely one week. None of the countries had previously enforced nationwide school closures, even during periods of conflict, as seen in Côte d'Ivoire (2002-2011) or Angola (1975-2002) [64].

However, it would be imprudent to attribute their delayed decision to close schools solely to the quality of their education systems, as none of them rank among the best on the continent [35]. Equally, it would be incorrect to attribute their decision to the availability of alternative educational options during crises. Instead, their relative slowness may be correlated with educational conditions that lack experience in emergency education. These countries also exhibit diverse and disparate social, health, and educational backgrounds. Their delayed response in closing schools during the COVID-19 pandemic could, thus, be partly due to the time-consuming process of determining how to continue education. Besides, in most of these countries, Ministries of Education established committees and task forces to engage in consultations and deliberations regarding suspending in-person educational activities [65]. As Hajer reports, this decision-making process, involving reflective committees and consultations, contributed to the delay in school closures, underscoring the complexities of social governance during times of crisis [66].

Hesitant post-active countries

Hesitant post-active countries include Burkina Faso, Eswatini, Namibia, Equatorial Guinea, Seychelles, Tunisia, Cameroon, Morocco, and the Central African Republic. These nine countries took some time eight to fourteen days between the arrival of the pandemic on their territories and the decision to close schools [67].

By referring to the chronological table created by the British Broadcasting Corporation to follow the progression of COVID-19 infections and fatalities, it is evident that the virus severely impacted these nations at the beginning of the outbreak in Africa. As Tardy points out, the beginnings of a crisis, especially a threatening one, are upsetting and destabilizing [68]. When faced with a difficult situation, there are two possible outcomes: A desire to tame it before making any decisions or a feverishness that results in inaction. Redissi cites the example of Tunisia, effectively demonstrating this point [69]. This country waited over 20 days after COVID-19 appeared on its soil, on March 2, 2020, before taking

measures to combat it through various structures such as the National Instance for the Fight against Coronavirus, the Permanent Commission for the Follow-up of COVID-19, and the National Security Council. This process followed a widespread consultation, however, resulting in disagreements between central and local governments.

It is evident that some post-active countries, such as Tunisia, have been slow to adopt the tools and mechanisms required for ensuring educational continuity. Burkina Faso, too, waited more than two weeks after the appearance of COVID-19 on its territory to define the modalities of pedagogical continuity outside school [62]. Cameroon and Morocco also did the same [2,14]. The delay in closing schools during COVID-19 in these countries was likely due to their inflexible and rigid decision-making processes in choosing distance learning modalities to mitigate confinement. In most of the countries in this sub-group, Ministries of Education extended this decision-making process to all components of the educational community, thus national consultations [14,67].

It's also worth noting that the hesitant post-active countries experienced the shortest school closure times: Burkina Faso (March 21 to October 1: 195 days) and Morocco (March 16 to September 7: 173 days), which are among those most affected by the pandemic. Schools in Eswatini (March 20 to July 4), Namibia (April 18 to June 4), Equatorial Guinea (March 16 to April 14), Tunisia (March 16 to June 1), Central African Republic (March 14 to June 20), Seychelles (March 26 to May 18, and Cameroon remained closed only for 106, 78, 90, 76, 82, 54, and 74 days (March 17 to June 1), respectively. There are several possible interpretations of these short school closure times compared to other African countries.

The first issue pertains to the remote pedagogical continuity tools used, which were inadequate in promoting educational inclusion and ensuring the quality of learning [70]. As in Cameroon, this consideration would have led to the reopening of schools in June, given the drop in COVID-19 contamination rates, so as not to exacerbate learning losses further [14]. The second interpretation highlights the sanitary measures wearing masks, hand washing, hydroalcoholic gels, and physical distancing integrated into schools, which would have made them safe and suitable learning environments during the COVID-19 period [35].

Late post-active countries

We refer to the last sub-group of post-active countries as "late," for they waited several weeks after the appearance of the coronavirus on their territories before implementing barrier measures, including school clo-

sures. As shown by Bashizi and Ndejjo et al., South Africa, Senegal, Togo, and the Democratic Republic of Congo (DRC) suspended all classroom-based educational activities a fortnight after the first case of COVID-19 was discovered on their soil [17,71]. Algeria and Nigeria did the same after 17 and 26 days, respectively, while Egypt decided after 30 days (World Bank, 2020). As Omtzigt et al., indicate, the prolonged silence in some countries between identifying the initial contaminations and implementing response strategies can be explained by different hypotheses that relate to these countries' educational conditions [50].

Firstly, these countries' health and education systems, except for the DRC and Togo, are among the most stable on the continent [72]. This relative advantage could justify the delayed closure of schools, even if it resulted in disadvantaged learners experiencing learning losses [33]. In addition to weighing the decision to close schools during the COVID-19 pandemic, it is important to consider how long these countries' Ministries of Education take to create and implement local solutions for continued education [17]. This was the case in Togo. According to the remark of the Togolese Minister of Education's remarks during the launch webinar of the ImaginEcole initiative on Mach 20, 2023, this country dedicated sufficient time to developing a mobile distance learning app known as "Teck Tal" to support its education system's response to the pandemic. This is also the case for Senegal, which was already well advanced in the field of digital education before the arrival of the pandemic and had adopted a similar strategy by developing a "National Education Information and Management System" (SIMEN). According to the Senegalese Minister of Education's presentation during the ImaginEcole conference, it was within the framework of this system that the "Education Channel" was launched, ensuring, alongside other local initiatives, the continuity of education in this country during the COVID-19 confinement. Morocco and Nigeria also set up remote educational continuity conditions before closing their schools [17,73]. More specifically, in Nigeria, as Soremekun points out, the High Coordinating Committee for Responses to COVID-19 devoted days to examining important issues before school closure [74]. As reported by Sfeir, these included the capacity of the country's technological equipment to meet the needs of its 46 million students, the financial capacity of households to support their children's distance learning, and the techno-pedagogical readiness of teachers to deliver online courses [75]. These questions also arose in the case of the DRC, whose geographical size would probably have contributed to the socio-political mechanisms of school closure in a crisis context [47,71].

To sum up, in this group, the immediate post-active countries, such as Gabon and Sudan, had acted promptly due to the relative stability of their educational conditions and widespread infrastructures. As for the slow post-active countries, they took around a week to close schools, often preceded by concerted action. Hesitant post-active countries, such as Tunisia and Morocco, were among the most brutal hit at the pandemic's start, leading them to think long and hard before closing schools. Finally, late post-active countries like Senegal and Nigeria first implemented local pedagogical continuity strategies before school lockdown. Hence, there were several weeks of waiting before the schools closed. All these various decisions result, thus, from several factors relating to the relevance of countries' educational conditions and governance.

Passive countries

The last category of African countries regarding the closure of schools during the COVID-19 pandemic consists of passive countries. These nations faced the repercussions of the pandemic and school closures without presenting less risky alternatives. They include three countries: Libya, Madagascar, and Uganda.

Libya took 306 days, nearly a year after the first appearance of COVID-19 on its territory on March 24, 2020, to initiate the closure of schools. Surprisingly, by July 4, 2020, Libya ranked as the sixth most severely affected country in Africa, reporting 463,321 COVID-19 cases and 6,107 related deaths, according to data from graphics.Reuters.com. The passivity in Libya's decision to close its schools can be attributed to the unstable socio-political situation that has persisted since 2011. During this crisis, millions of children relied on schools as a food source provided by the World Food Programme [76,77]. In this context, shutting down schools would have meant depriving these vulnerable children of their meals. Consequently, Libya opted for a brief school closure, lasting only 21 days, which stands out as the shortest duration of school lockdown due to the pandemic in Africa, in stark contrast to Uganda, where schools remained closed for an extended period [78].

Uganda responded promptly by closing schools but maintained this closure for an exceptionally extended period, from March 22, 2020, to January 10, 2022, in response to the COVID-19 pandemic [79]. Uganda's reactive-passive approach can be attributed to its concern about preventing a social and healthcare catastrophe related to the coronavirus, especially given the vulnerability of its healthcare and education systems in the African context [80]. For instance, according to Panara, an estimated 48% of Uganda's population faced difficulties accessing medical care in 2018, ranking it among the twelve African countries with the lowest healthcare coverage [80]. Meessen et al., also noted that Uganda is one of the three African countries with fragile epidem-

ic preparedness capacities [81]. Similarly, in education, Uganda grapples with high dropout rates, learning disparities, and subpar teaching quality [82]. Fearing the potential overwhelming of its healthcare system, Uganda implemented strict measures in response to school closures, as highlighted by Panara [80]. Nevertheless, Uganda still encountered the effects of COVID-19 and the extended school closure, with the country ranking among the fifteen African states most affected in terms of infections (162,572 cases) and deaths (3,570). According to Mouillaud, an estimated 30% of Ugandan children may not be able to return to school, with learning losses potentially reaching 50% [79].

In contrast to Uganda, which was reactive in closing schools, Madagascar waited one month and fifteen days after the pandemic arrived on its territory to suspend in-person educational activities. This closure lasted a total of five months in 2020. Although Madagascar did not downplay COVID-19 like Burundi, it criticized the Western-imported protective measures and vaccines, instead promoting its "COVID-Organic" natural remedy [83]. As Verneau stresses, this led to a conflict between Madagascar and the World Health Organization, Amnesty International and the West, in general, accused of interference [84]. According to Caramel, Malagasy authorities' trust in COVID-Organic as a preventive and curative solution to COVID-19 led to delayed school closures [85]. The closure only occurred with the continuous increase in infections, pushing the country to join the COVAX initiative [86]. In total, Madagascar suffered both the effects of the pandemic, with 62,844 infected cases and 1,335 deaths as of February 14, 2022, and the effects of school closures. On March 13, 2021, UNICEF Madagascar tweeted that the closure of schools in the country had affected over 7 million children, potentially leading to permanent absences (Tables 1-7).

Table 1. Classification of African countries based on their school closure measures during the COVID-19 pandemic.

Categories	Sub-categories	Number	Countries
Defiant countries	Non applicable	2	Burundi, Cape Verde
Pre-active countries	Non applicable	8	Botswana, Comoros, Guinea-Bissau, Malawi, Mali, São Tomé and Príncipe, South Sudan, Uganda
Reactive countries	Non applicable	9	Chad, Gambia, Liberia, Mozambique, Niger, Rwanda, Sierra Leone, Tanzania, Zambia
Post-active countries	Immediate post-active countries	7	Ethiopia, Gabon, Kenya, Mauritania, Mauritius, Somalia, Sudan
	Slow post-active countries	9	Angola, Benin, Congo, Côte d'Ivoire, Djibouti, Eritrea, Ghana, Lesotho, Zimbabwe
	Hesitant post-active countries	10	Burkina Faso, Cameroon, Central African Republic, Equatorial Guinea, Eswatini, Guinea, Morocco, Namibia, Seychelles, Tunisia
Passive Countries	Late post-active countries	7	Algeria, Democratic Republic of Congo, Egypt, Nigeria, Senegal, South Africa, Togo
	Non applicable	3	Libya, Madagascar, Uganda

Table 2. Pre-active countries.

Countries	First confirmed COVID-19 case	Date of school closure	Number of days between confirmed case and school closure
Botswana	30 March	24 March	-7 days
Comoros	30 April	23 March	-16 days
Guinea-Bissau	25 March	19 March	-7 days
Malawi	23 March	09 March	-15 days
Mali	25 March	19 March	-7 days

São Tomé and Príncipe	6 April	20 March	-44 days
South Sudan	20 March	10 March	-11 days
Uganda	22 March	18 March	-4 days

Table 3. Reactive countries.

Country	COVID-19 arrival	School closure date	Number of days between confirmed case and school closure
Rwanda	14 March, 2020	14 March, 2020	0
Zambia	18 March, 2020	18 March, 2020	0
Sierra Leone	31 March, 2020	31 March, 2020	0
Tanzania	16 March, 2020	17 March, 2020	1
Liberia	16 March, 2020	17 March, 2020	1
Gambia	17 March, 2020	18 March, 2020	1
Niger	19 March, 2020	20 March, 2020	1
Chad	19 March, 2020	20 March, 2020	1
Mozambique	22 March, 2020	23 March, 2020	1

Table 4. Immediate post-active countries.

Country	First confirmed COVID-19 case	Date of school closure	Number of days between confirmed case and school closure
Gabon	12 March, 2020	14 March, 2020	2
Sudan	13 March, 2020	15 March, 2020	2
Mauritius	18 March, 2020	20 March, 2020	2
Kenya	13 March, 2020	15 March, 2020	2
Mauritania	13 March, 2020	15 March, 2020	2
Somalia	16 March, 2020	18 March, 2020	2

Table 5. Slow post-active countries.

Country	First COVID-19 case	School closure date	Number of days between confirmed case and school closure
Ghana	12 March, 2020	16 March, 2020	4
Zimbabwe	20 March, 2020	24 March, 2020	4
Angola	21 March, 2020	24 March, 2020	3
Côte d'Ivoire	11 March, 2020	16 March, 2020	5
Congo (Republic of the Congo)	14 March, 2020	18 March, 2020	4
Djibouti	18 March, 2020	23 March, 2020	5
Lesotho	15 March, 2020	19 March, 2020	4
Benin	16 March, 2020	22 March, 2020	6
Eritrea	21 March, 2020	27 March, 2020	6

Table 6. Hesitant post-active countries.

Country	First COVID-19 case reported	School closure date	Number of days between confirmed case and school closure
Burkina Faso	9 March, 2020	16 March, 2020	7
Eswatini	14 March, 2020	21 March, 2020	7

Namibia	13 March, 2020	20 March, 2020	7
Equatorial Guinea	14 March, 2020	21 March, 2020	7
Seychelles	14 March, 2020	22 March, 2020	8
Tunisia	2 March, 2020	12 March, 2020	10
Cameroon	6 March, 2020	18 March, 2020	12
Morocco	2 March, 2020	16 March, 2020	14
Central African Republic	14 March, 2020	24 March, 2020	14

Table 7. Late post-active countries.

Country	Date COVID-19 first confirmed case	Date of school closure	Number of days between confirmed case and school closure
South Africa	5 March, 2020	20 March, 2020	15
Senegal	2 March, 2020	19 March, 2020	17
Togo	6 March, 2020	22 March, 2020	16
Democratic Republic of Congo	10 March, 2020	29 March, 2020	19
Egypt	14 February, 2020	15 March, 2020	29
Algeria	25 February, 2020	12 March, 2020	17
Nigeria	27 February, 2020	19 March, 2020	20

In conclusion, the passivity of the three countries above results from their unreliable education conditions: socio-political instability, precarious educational infrastructure, and vulnerability of healthcare structures, thus highlighting the importance of underlying dynamics in a country's education conditions during a crisis.

In sum, we have analyzed school closures in Africa during the most critical period of COVID-19 (March-July 2020) to understand how they reveal the strengths and weaknesses of a country's educational conditions. We aimed to demonstrate that these exceptional measures were not neutral or isolated. They acted like a telescope, enabling us to see the fragility or robustness of the social, institutional, and organizational factors that impact education in a crisis context. Instead of examining its effects, which is the focus of most research on "COVID-19 and education in Africa" Plumelle and Nwokeocha, we have decided to investigate what it hides and what it reveals about a country's ability and resilience to withstand educational challenges during times of crisis [8,9].

We thus utilized an approach that combines the sociology of crisis Macamo, Peretti-Watel and the sociology of decision Guarnelli to analyze data on two important factors related to school closures during the COVID-19 pandemic [22-24, 27]. These factors are the period between the onset of COVID-19 and the school lockdown and the duration of the school closures.

Conclusion

The dual correlation we established between the data and their contexts, along with the performance indicators of the education systems in those contexts, helped us to comprehend the reasons behind African countries' decisions to shut down schools. It also enabled us to categorize African countries according to how they had suspended their face-to-face schooling activities during COVID-19 while explaining this categorization. We thus established five groups: The resistant (or defiant), the pre-active, the reactive, the post-active, and the passive.

Our results indicate that despite the "global containment," schools in Burundi and Cape Verde have remained operational, which indicates their remarkable resilience in the face of the pandemic. On the other hand, the early closure of schools in countries such as Guinea-Bissau, São Tomé and Príncipe, Comoros, and South Sudan stems from a desire to avoid further deterioration in their already fragile social, health, and educational conditions. As for reactive countries such as Rwanda, Sierra Leone, Liberia, and Gambia, their readiness to close schools reproduces their experience in managing crises and epidemics, even if this does not always reflect the robustness of their education

systems. As for post-active countries, their reactions to the pandemic regarding school closures can be attributed to relatively resilient educational conditions or educational governance lacking crisis management experience. Meanwhile, the passivity of Uganda, Libya, and Madagascar highlights socially deficient education systems.

We thus emphasize that an unusual measure in times of crisis, such as the closure of schools during COVID-19 in Africa, should not be seen as a standalone action from its context. Instead, it acts as a revealing indicator of the complexity of the underlying educational and social realities. In this case, this approach has allowed us to show that behind school closures lie factors that shed a profound light on educational accessibility, school policies, and educational governance. It also acts as a barometer of educational resilience, i.e., the capacity of an education system to adapt to a crisis while preserving the continuity and quality of training. Therefore, it provides valuable insight into the strengths and weaknesses that influence teaching and learning quality and effectiveness in a country amid a crisis. Such an approach offers a "bottom-up" method to identify the "impact" of a pandemic on educational conditions while inviting a deeper understanding of educational resilience as the expression of the relationship between these educational conditions and responses to a significant crisis in a context. Meanwhile, this study calls for an in-depth analysis of the factors that impact a country's ability to mitigate the effects of a crisis in education, including geopolitical, institutional, socio-economic, and cultural factors.

References

[1] Awa CF. COVID in Africa: Open or close schools, the dilemma of the continent's authorities. 2021.

[2] Spaull N, Van der Berg S. Counting the cost: COVID-19 school closures in South Africa and its impact on children. S Afr J Child Educ 2020;10(1):1-3.

[3] Ceesay EK. Potential impact of COVID-19 outbreak on education, staff development and training in Africa. Res Glob 2021;3:1-6.

[4] Sultana F, Bari R, Munir S. Impact of school closures due to COVID-19 on education in low- and middle-income countries. J Glob Health Rep 2022;6:e2022034.

[5] Impact of COVID-19 on Children's Education in Africa. Human Rights Watch 2020.

[6] Courade G. The Africa of poverty in the time of COVID-19. Foreign policy 2021;(1):39-52.

[7] Durpaire JL. Some effects of COVID-19 on schools around the world. Sèvres International Review of Education. 2020;(84):19-23.

[8] Plumelle B. School closures and their effects on student learning. Int J Educ 2021;(87):31-37.

[9] Nwokeocha S. Impact of COVID-19 on teaching and learning in africa assessed by the education unions. J Educ Learn. 2021;10(4):15-26.

[10] Chaney C. Family stress and coping among African Americans in the age of COVID-19. J Comp Fam Stud 2020;51(3-4):254-273.

[11] Chippaux JP. Impact of COVID-19 on public health in sub-Saharan Africa. Bull Acad Natl Med 2023; 207(2):150-164.

[12] Wang G, Zhang Y, Zhao J, Zhang J, Jiang F. Mitigate the effects of home confinement on children during the COVID-19 outbreak. Lancet 2020;395(10228):945-947.

[13] Loades ME, Chatburn E, Higson-Sweeney N, Reynolds S, Shafran R, Brigden A, et al. Rapid systematic review: The impact of social isolation and loneliness on the mental health of children and adolescents in the context of COVID-19. J Am Acad Child Adolesc Psychiatry 2020;59(11):1218-1239.

[14] Béché E. Cameroonian responses to COVID-19 in the education sector: Exposing an inadequate education system. Int Rev Educ 2020;66(5):755-775.

[15] Igodoe AA, Marie-France L. Editorial. The impact of COVID-19 on educational inequalities in the French-speaking world. Education in Debate: Comparative Analysis 2022 ; 12(1), 1-11.

[16] Jack R, Oster E. COVID-19, school closures, and outcomes. J Econ Perspect 2023;37(4):51-70.

[17] Ndejjo R, Tusubiira AK, Kiwanuka SN, Bosonkie M, Bamgboye EA, Diallo I, et al. Consequences of school closures due to COVID-19 in DRC, Nigeria, Senegal, and Uganda. PLOS Glob Public Health 2023;3(10):e0002452.

[18] Morency L. Are learning conditions the same for all students? J Educ Sci 1990;16(1):43-53.

[19] Renaud G. Learning conditions confronted with the new clothes of training. For 2012;22-34.

[20] Poolton JM, Masters RS, Maxwell JP. The relationship between initial errorless learning conditions and subsequent performance. Hum Mov Sci 2005;24(3):362-378.

[21] Bourion-Bédès S, Rousseau H, Batt M, Tarquinio P, Lebreuilly R, Sorsana C, et al. The effects of living and learning conditions on the health-related quality of life of children and adolescents during the COVID-19 lockdown in the French Grand Est region. BMC Public Health 2022;22(1):517.

[22] Macamo E. The normality of risk: African and European responses to COVID-19. 2020.

[23] Macamo E. Africa and COVID-19: How to translate dangers into risks. 2020.

[24] Guarnelli J. The paradox of decision-making in an over-publicized crisis situation. 2014.

[25] Grossetti M. Sociology of the unpredictable: Dynamics of activity and social forms. PUF 2005.

[26] Roux-Dufort C. Managing and deciding in a crisis situation: Diagnostic, prevention and

decision-making tools. 2003.

[27]   Peretti-Watel P. Sociology of risk and health crises: An insight into the coronavirus pandemic. 2020.

[28]   Koselleck R. Crise. Tracés 2023;(44):143-82.

[29]   Lagadec P. Learning to manage crises.1993.

[30]   Breyton M, Schultz É, Rouquette A, Mancini J. Information overload in the context of COVID-19 pandemic: A repeated cross-sectional study. Patient Educ Couns 2023;110:1-7.

[31]   Faure A. The COVID crisis seen by the world of research. 2020.

[32]   Klingelhoefer D, Braun M, Brueggmann D, Groneberg DA. The pandemic year 2020: World map of coronavirus research. J Med Internet Res 2021;23(9):e30692.

[33]   Consequences of school closures. UNESCO 2021.

[34]   Chanceline Niyera. Burundi: Continue learning safely during the COVID-19 pandemic. Global Partnership for Education 2022.

[35]   Wathi. The lessons of the COVID-19 crisis in education in West Africa. 2022.

[36]   D'Alançon F. COVID-19: After two years of closure, Uganda reopens its schools. 2022.

[37]   Papillon M. Burundi defies coronavirus and WHO. 2020.

[38]   COVID-19: Burundi government changes strategy regarding vaccination. Radio France Internationale 2020.

[39]   Kinda A. Best African Education Systems 2020: Cape Verde, the only West African country in the top 10. 2020.

[40]   Pires Ferreira AC. The education system of Cape Verde: Reforms and current issues. Int Rev Educ 2013;(63):21-27.

[41]   Bisin S, Thompson G. Only 1 in 3 countries ready to safely welcome children back to school in West and Central Africa. United Nations Childre's Fund 2020.

[42]   Oxfam. COVID-19 and female learners in South Sudan: The impact of school closures in Juba, Rumbek, Kapoeta, Torit and Pibor. 2021.

[43]   Kidman R, Breton E, Behrman J, Kohler HP. Returning to school after COVID-19 closures: Who is missing in Malawi? Int J Educ Dev 2022;93:1-6.

[44]   Meyerfeld B. South Sudan, a black hole for education. 2015.

[45]   Jourde J. In Guinea-Bissau, the education system remains largely to be built. 2020.

[46]   Cross Catholic Blog. Problems Facing the Education System in Malawi. 2021

[47]   ADEA. Delivering education at home in African member states amid the COVID-19 pandemic: Country status report. Reliefweb 2020.

[48]   Yacouba Barma A. Education: The good and bad students of French-speaking Africa. The Africa Tribune 2017.

[49]   Tchad. National response plan for the education sector to the COVID 19 epidemic in Chad (PRNSE C19). 2020.

[50]   Omtzigt DJ, Pople A. The cost of doing nothing: The price of inaction in response to the COVID-19 crisis. United Nation (UN), Off Coord Humanit Aff. 2020.

[51]   ADEA. Distance education and open learning In Sub-Saharan Africa: A literature survey on policy and practice. Final Report 2002.

[52]   Komba W. Increasing education access through open and distance learning in Tanzania: A critical review of approaches and practices. Int J of Educ dev using ICT. 2009;5(5):8-21.

[53]   Siaciwena R, Lubinda F. The role of open and distance learning in the implementation of the right to education in Zambia. Int Rev Res Open Dist Learn 2008;9(1):1-2.

[54]   Study of the education sector in Rwanda: Revised edition. UNESCO 1998.

[55]   IRB. Rwanda: Information on schools opening during the 1994 genocide in Rwanda, particularly in Rubavu in the Gisenyi prefecture. 1999.

[56]   Lai B, Thyne C. The effect of civil war on education, 1980-1997. J Peace Res 2007;44(3):277-292.

[57]   Yao H, Memon AS, Amaro D, Rigole A, Abdou YD. Public health emergencies and school attendance: What the Ebola crisis can teach us about the coming post-COVID education landscape. Int J Educ Dev 2021;85:1-12.

[58]   Samonova E, Devine D, Sugrue C, Capistrano D, Sloan S, Symonds J. 'An empty bag cannot stand upright': The nature of schooling costs in Sierra Leone. Int J Educ Dev 2021;87:1-7.

[59]   Chavez D. Back to school after the Ebola outbreak. reliefweb 2015.

[60]   Wali Wali C, Ossé L. Gabonese people express their dissatisfaction with education needs. Afro Barometer 2021;1-8.

[61]   Kamil H. Study on the situation of education in Mauritania. UNESCO 2003.

[62]   Impact of COVID-19 on Cameroon's education system. UNESCO 2020.

[63]   Wagnon S. Educational continuity: Meanders and paradoxes in times of pandemic. Recherches and éducations 2020.

[64]   Kone A. The persistence of the Angolan conflict between 1991 and 2002. World (s) 2018(1):175-194.

[65]   Madjissembaye N. COVID-19: 133 cases in the first week of December, government strengthens measures. Tchad Infos 2021.

[66]   Hajer C. Tunisia: Scientific Committee for the

Fight against Coronavirus Decides to Strengthen the Vaccination Process. AA .com 2022.

[67] Béché E, M P Sii. African schools in the era of COVID-19. 2024.

[68] Tardy T. Chapter 1. Introduction to Crisis Management. Crisis management, peacekeeping and peacebuilding 2009;13-34.

[69] Redissi H. Tunisia facing COVID-19 Thinking together, acting together. In the Realm of Corona Normativities 2020;287-296.

[70] Tsague NB, Dounla MF, Coulibaly B. Distance education experiences in secondary education in Cameroon in the era of COVID-19: Views and perspectives. Contexts and didactics 2022; (19). [Crossref]

[71] Bashizi A. Learning in lockdown: Children in the DRC share the impacts COVID-19 school closures have had on them. 2021

[72] Kamdem G. Top 10 African countries with the best healthcare systems in 2020. 2020.

[73] The World Bank's education response to COVID-19. World Bank 2020.

[74] Soremekun O. UN strengthens Nigeria's COVID-19 response capacity. Africa Renewal 2020.

[75] Sfeir Y. Democratic Republic of Congo: Increasing alternatives to ensure learning continuity during the COVID-19 pandemic. Global Partnership of Education 2021.

[76] Abou Ghrara A. WFP and the Libyan ministry of education launch a central kitchen project to provide nutritious meals to school children. World Food Program 2022.

[77] COVID-19: Gabon Telecom's nice gesture. Direct Infos 2020.

[78] Gillon J. Coronavirus outbreak in war-ravaged Libya raises fears of worst. Jeune Afrique 2020.

[79] Mouillaud L. In Uganda, the world's longest school closure has left its mark. 2022.

[80] Panara M. Health: why the challenge is so great for Africa. 2020.

[81] Meessen B, Van Damme W. Health systems in low-income countries: Towards a revision of institutional configurations? Developing Worlds 2005;131(3):59-73.

[82] Naamara W, Nabasumba S, Nabadda C. Educational inequality and quality of life: A comparative study of secondary schools in Central and Northern Uganda.2017.

[83] Borgia G. Madagascar: The "miracle" herbal tea available in capsules against COVID-19. 2020.

[84] Verneau L. In Madagascar, COVID-19 is seriously damaging the school environment. Radio France International 2021.

[85] Caramel L. Anti-coronavirus herbal tea with artemisia: The Malagasy president's gamble. 2020.

[86] Ioussouf R. Malagasy president's COVID-organics fails to stop COVID-19 . 2020