

## **Covid-19: impeding Deepen crisis and higher education in Nigeria**

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### **Abstract**

Covid-19 pandemic is and remain a major problem experienced around the world. This paper investigates the deepen Covid-19 crisis on the Nigeria Higher Education. School closures due to coronavirus (COVID-19) are affecting learners worldwide. Therefore, the thriving concept of this paper is to ensure that the temporary measures of e-learning benefits both learners in rural and urban area and not to create inequality in the Education system in Nigeria. The paper identifies online learning, WhatsApp, SMS message, radio, television, e-mails, internet as medium of e-learning and to maintaining good inter-personal communications among others as significant factors that will help to bridge the gap between learners in public and those in private institutions in Nigeria. The roles of stakeholders is to facilitate measures that is all encompassing that will motivate teachers and others in exploring new online curricula modalities as a temporary measures to facilitate and promote e-learning among others. Thus, the challenges of e-learning facing Nigeria public and private universities learners needs a collaborative effort in ameliorating their plight. This paper discusses the meaning of Education, the concept of school closure and Covid-19, Covid-19 crisis and covid-19 predictable short, medium and long term impact, role of stakeholder during covid-19 crisis and Nigeria Education, factors that will aid e-learning, and the general teaching and learning process in Nigeria Education.

**Keywords:** Covid-19 pandemic, impeding, deepen, crisis, and Nigeria higher education

### **Introduction**

Since its foundation, universities, like any other social institution, have had to face devastating epidemics that have impacted their daily functioning. And they have survived and continued their mission even with their doors closed. In 1665, Cambridge University closed due to a black plague epidemic that struck England. Isaac Newton had to return to Woolsthorpe Manor, his home. One day, sitting in the garden, he saw an apple fall that inspired him to formulate his theory of universal gravitation or, at least, he told William Stukeley who included this anecdote in Newton's biography that he would publish after his death (Stukeley, 1752) <sup>[8]</sup>. The moral of this story is that, inasmuch as the doors of higher education institutions have to be closed, academic activities continue where there are spirits committed to science and training, and, sometimes, with surprising results. Incidentally, the University of Cambridge has closed its doors now in 2020, for the second time in its history.

As put by UNESCO (2006) <sup>[9]</sup>, nations have a quest to provide learning environments that are economically, socially, culturally and physically accessible for all children. It is, therefore, for this quest that countries keep adapting and updating their basic education policies. People can similarly be educated through online reading of e-books, reading books, excursion, exploring their environment or even by attending classes (Peters, 2010). Furthermore, processes in education are viewed as tasks related to achievement; that is to refer to what people can consequently achieve in terms of production at individual, national and international levels (UNESCO, 2007) <sup>[10]</sup>. Thus, School closures due to coronavirus (COVID-19) are affecting learners worldwide. By the end of March 2020, over 180 countries had closed down their schools, affecting 87.4% of learners (over 1.5 billion students.). Governments

are taking action to support learners to continue their education remotely. Some are using technology, but they face a number of challenges as they also deal with countrywide healthcare emergencies and likely economic recession. We know that school closures due to health crises such as Coronavirus, Ebola outbreaks impact learners. They lead to more school dropouts, leave learners at a higher risk of abuse, loss of confidence and self-esteem, and decline in quality teaching and learning process.

In Nigeria, school opportunity is correlated to income level, and public schools differ from private schools in the populations they serve. While private schools serve learners from higher socio-economic backgrounds who are willing and able to pay more to access the better resources offered by private schools, public schools which are usually free, comprise students from lower socio-economic households and low-income areas. In instances where distance learning opportunities are available, uptake will be low from the students in the public school's category, as a result of poor infrastructure such as lack of electricity, or poor/no internet connectivity, etc.

Opportunities to learn within the homes are also limited, given that a parent's ability to provide education support to their children will be shaped by their own level of educational attainment, general literacy level, and other commitments. Given the significant relationship between educational attainment and income level, and the correlation between parental income level and school choice, we can infer that the literacy level of parents in public schools in Nigeria might be lower than their private school counterparts. In instances where the parents are educated, investing the time to train their children during this time might be a luxury. For Nigeria, the reality is simple - while the school closures are necessary to curtail the spread of the COVID19 virus, until the ban on movement is lifted and

schools are reopened, majority of students will not be learning. A longer-term impact of these school closures would be deepened educational inequality. While some international development partners (UNESCO, for example) have put together and provided access to ICT-based resources to foster learning, uptake will depend largely on the level and quality of digital and internet access, and language accessibility (as most programs are available in English or other non-native Nigerian languages).

No one knows for sure how long these closures are likely to last. Initial measures taken by many governments have ranged from 15 to 30 days, but one can easily anticipate that they will be extended until the pandemic subsides. It is not unreasonable to imagine scenarios where this situation can last two months or more, or as in the case of Spain and Italy where the decision was announced not to resume face to face classes for the rest of the academic course which normally ends in June.

By implication, the impact of the pandemic on higher education was abrupt and in the majority of cases there was no contingency plan other than to attempt to continue classes remotely, it is important that we start to conceptualize a way out of this crisis, ensuring the highest degree possible of inclusion and equity. Indeed, one could say that the pandemic adds a further degree of complexity to higher education globally but particularly in the region because of the unresolved challenges it faced such as growth without quality, inequities in access and achievement, and the progressive loss of public financing.

### **The Meaning of Education**

Education is a continuous process that compasses teaching and learning which commences from birth till death. These processes is what Fafunwa (1987) described as the aggregate by which a child or adult develops the abilities, attitudes and other forms of behaviors which are of positive value to the society in which he lives. Education is also perceived in three dimensions. They are development of knowledge, training of mental abilities and development of character (Anyago, 2011). The three areas accentuated above can be attained through the rendering of assistance to students, teachers, parents school management which is what counselling entails. Education is a mirage of all activities that involves the learners, teachers and content to be learnt or taught. In most of these activities counselling is required to make teaching and learning experiences worthwhile. A section of the National Policy on Education (NPE) states that education should be geared towards: "Self-realization, better human relationship, individual and national efficiency, effective citizenship, national consciousness, national unity, social, cultural, economic, political, scientific and technical progress" (NCE, 2004). The laudable objective indicated above cannot be achieved by teachers' effort alone. The input of e-counselling through the effort of professional counsellors is required to help pupils and students alike achieve these e-learning educational goals. Therefore, electronic communication involves the use of e-mails, internet and communication aided strategies in counselling clients. In addition, counsellors are not left out in this all-important phenomenon which has potential to transform not only counselling practices but education as well. Counsellors who lack basic skills in electronic services may not be able to email and make internet contact with distant clients that need such

help. This may have been necessitated by lack of access to the electronic gadgets or lack of training in their usage. It is within these premises that the importance of education can be attached to its role in guaranteeing sustainable socio-economic development in countries. Arguably, nations with educated people are likely to achieve strong social cohesion and exhibit remarkable economic growth based on productivity. On the other hand, the lack of education leaves nations stranded in illiteracy and with low or no productivity. Thus, countries have established different policy frameworks to ensure basic education for every citizen to eradicate poverty and improve production in different sectors. As put by UNESCO (2006) <sup>[9]</sup>, nations have a quest to provide learning environments that are economically, socially, culturally and physically accessible for all children. It is, therefore, for this quest that countries keep adapting and updating their basic education policies.

### **The concept of school closure and covid-19 Crisis**

The past few weeks have ushered in a range of government sanctioned and structure-shifting risk-control directives across Nigeria and the Globe, in an attempt to curtail the spread of the novel coronavirus disease- COVID-19. From international airport closures, to a nationwide closure of all schools, and now, a two-week lockdown of three major states - Lagos, Abuja and Ogun, the ramifications from the slowdown/shutdown of economic activity are poised to be severe for Nigeria. It is especially critical, because in the backdrop of COVID-19, the global economic crisis and the recent slump in oil prices are further expected to intensify the impending economic crises, and create sharp shocks that will reshape the economy in the near term. For some sectors, the immediate ramifications are evident. One of such sector is the basic education sector, the impact of which has been largely felt by students. The nationwide school closures have disrupted learning and access to vital school-provided services for a record number of students in Nigeria. According to UNESCO, almost 40 million learners have been affected by the nationwide school closures in Nigeria, of which over 91 percent are primary and secondary school learners. In a short time, COVID-19 has disrupted the landscape of learning in Nigeria by limiting how students can access learning across the country. For an already fragile education system, the COVID-19 pandemic poses unprecedented challenges on the government, students, and parents, that will highlight and could amplify some of the cracks in the system. As the nation begins to grapple with these challenges, a key question arises: Is the Nigerian education system designed to adapt rapidly to the changing world? Given the state of affairs in the world today, the nation's ability to ensure continuation of learning will depend largely on their ability to swiftly harness available technology, provide adequate infrastructure, and mobilize stakeholders to prepare alternative learning programs. Generally, Nigeria's education sector is not adapting, and is expected to struggle on that front for the foreseeable future. However, the consequential socio-economic burden will be borne disproportionately by students in public schools, as compared to those in private schools. While several private schools have begun to initiate distance learning programs, and taking advantage of the myriad of ICT-learning opportunities provided by the international community, the government limited by funds and persistent deficiencies in planning, is yet to announce

any official plans for providing distance learning opportunities, especially for public schools. The implication being that these students in public schools currently have no formal learning plans and could be missing learning altogether.

### **Covid-19 Predictable short, medium and long – term impact**

In the absence of references to similar crises in the past, it is difficult to predict what may happen in the immediate future. Naturally, it is easy to document current impacts, but not so for those that will impact on the different actors in the medium and long term. In an effort to facilitate an analysis, the real and estimated impacts for the different actors and for the systems as a whole are presented below.

#### **A. Students**

The most immediate impact has obviously been that the temporary cessation of classroom activity at higher education has left students, particularly undergraduates and those on the verge of finishing high school and aspiring to begin tertiary education, in a completely new situation and without a clear idea of how long the impact will last, the immediate effect it will have on their daily life, costs and other financial burdens and, naturally, on the continuation of their studies. The situation is particularly worrying for those higher education students who are more vulnerable on account of their more fragile condition. A disruption of their space brought on by a crisis such as this one, can exacerbate their fragile condition and force them to drop out, thereby yet again, perpetuating a situation of exclusion as a result of the inequity which is characteristic of the higher education system in the region. This inequity is reflected in the high dropout and non-completion rates in higher education: in Latin America, on average, only half of the people between 25 and 29 years who were enrolled did not complete their studies, either due to abandonment or because they are still studying. Of those who drop out, half do so in the first year of their career (Ferreyra, Avitabile, Botero Álvarez, Haimovich Paz, & Urzúa, 2017) <sup>[4]</sup>. Moreover, it is difficult to have a sense of the multiple and different effects on students with different profiles, irrespective of their socioeconomic background, starting with gender.

Personal adjustment to daily life: Students have had to rearrange their daily lives to adjust to a situation of confinement. Most of the students who were displaced far from their families, but within the same country, have returned home. However, in the case of students abroad, the situation remains highly variable, with tens of thousands stranded in destination countries waiting for on-site activities to resume or because they are unable to return to their countries due to closure of airports and borders. Inevitably, the loss of social contact and socialization routines that are part of the daily experience of a higher education student will take its toll. The isolation that is inevitably associated with confinement will have effects in terms of socioemotional balance that will leave their mark, particularly on those students with pre-existing problems of this nature. The more vulnerable students participating in qualifying and remedial programs will be more hardly hit by isolation. A survey conducted during the last week of March among higher education students in the United States shows, for example, that 75% have said that they have experienced anxiety and depression as a result of the crisis.

#### **Financial costs and burdens**

Students and, in many cases, their families will have to continue to bear the costs associated with their higher education. Except in the very few countries where there are no fees, students must continue to face the associated costs, particularly when, in order to pursue their higher education, they have had to seek temporary residence, whether individual or shared, in a place other than their domicile, at a cost they must continue to bear, even if they decide to return to their family home. More than 260,000 students have signed a formal petition to the English government for a significant part of their tuition amount to be returned to them. Students consider that the online teaching that is being proposed to them is not worth the cost of the regular annual tuition, which is, on average, 9,250 pounds per year (USD 11,500). However, the two assumptions mentioned above, that of short - term and the continuation of teaching activities with a non-face-to-face modality, may be questioned if the duration of the cessation of face-to-face activities is prolonged to the equivalent of one academic term or even longer. In this eventuality, it is possible that voices will be raised, justifiably or not, in favor of suspending the academic year assessment, which is particularly dramatic in the case of students in final year high school, who are aspiring to enter higher education. If so, the implications in terms of financial burdens for those students who have loans or credits would ultimately mean that they will be required to extend their program for the equivalent of one more year. We do not know that this is equally feasible for all students and families. For the moment, only delays have been announced because the long period of suspension of face-to-face classes is not yet anticipated, so it will be necessary to closely monitor the evolution of this situation, which is, for now, extremely fluid. Finally, it is important to anticipate the situation in which the cohorts of students who will graduate in 2020 or even 2021 will find themselves having to face the payment of their loans and university credits, in a depressed labor market because of the crisis. Moreover, OEI estimates anticipate considerable declines in the income of new graduates due to the crisis (Sanz, Sáinz, & Capilla, 2020) <sup>[7]</sup>.

#### **The replacement of face-to-face classes**

The students have also had to make an effort to adapt to what for many of them are new formulas for teaching and learning where they have been fortunate to find a continuity offer. The choice for continuity solutions that demand connectivity is spreading globally when the reality is one of low connectivity in households in low- and middle-income countries. First, the percentage of households with an internet connection and then the low connectivity in Africa and in Latin America and the Caribbean, which barely reached 17% and 45% respectively. In the case of Latin America and the Caribbean this means that only one in every two homes is connected. The traditional formulas of distance education, that is, those in which the teacher continues to teach a regular class that is broadcast live and can be retrieved on a delayed basis, seem to be the most appreciated by students because they are the ones that best reproduce the dynamics to which they are used. Initiatives that radically change operating rules and require students to leave their comfort zone without any prior training are less appreciated because, for quite different reasons,

undergraduates tend to be more conservative than might be thought or be less prepared to change modes (Watts, 2016). On the other hand, the behavior of postgraduate students seems to be, in this sense, more open to participatory methodologies or that require a greater degree of interaction between themselves and the faculty. In general, it does not seem that the change in modality has been received very positively. Part of the disaffection stems from the fact that the content offered was never designed within the framework of a distance higher education course, but rather tries to make up for the absence of face-to-face classes with virtual classes without further preparation. Secondly, the expectations of students are different if they expect to enroll, from the beginning, in a distance education course or in a regular course, with all the social and experiential elements that always accompany the face-to-face experience in an HEI. It should also be noted that distance education requires more discipline and commitment on the part of the student, which perhaps explains why it is more successful among older people, that is, postgraduates, compared to undergraduates. The face-to-face experience is particularly important for vulnerable students who have often had fewer opportunities for interaction in areas such as that offered by a university campus that allows them to strengthen their social skills, so that, if the closure is prolonged, they will be more disadvantaged than other students. It is difficult to foresee what impacts the change of medium and long-term teaching and learning modality may have for students. In principle, if the traditional dynamics are reproduced through technological means, they should not be very significant because the return to the classroom will be experienced as a return to normality, especially when formulas for continuous evaluation of online learning have been planned. But one must also consider that the experience will be settled in some cases with many doubts about the need to return completely to face-to-face without taking more advantage of the opportunities offered by technologies. Of course, the million-dollar question is whether, assuming continuity of teaching activities, students will achieve the learning objectives designed for the course. The existing research leaves no room for doubt in this regard and confirms that, in principle, the results should be even, particularly if the duration is short (Yen, Lo, Lee, & Enriquez, 2018); but the variables involved are many and the contexts are very different to assume that this will be the case in all cases.

### **International academic mobility**

The global latency of the disease and the unknowns it still holds, the exhausted health systems in some countries, a questioned international cooperation, a global economy that seems to be chaotically globalizing and the extended closure of borders, augur for an international academic mobility that will remain strongly flat in the short term. Some expert voices have suggested that it will take a minimum of five years to return to pre-crisis levels of international mobility. However, it is highly likely that destinations will likewise change at least for Asian students, with Malaysia becoming the main focus, followed by South Korea and Singapore, privileging regional agreements. On the other hand, it is not known how this health crisis will affect the forced and non-forced displacement of hundreds of thousands of people around the world, which will continue to put pressure on the States that must continue to seek solutions both to guarantee

the right to education at all levels to these groups, as for a fair recognition of their studies, titles and diplomas. The UNESCO General Convention on Higher Education Qualifications (November 25, 2019) could help to partially alleviate this prognosis if its ratification by 20 countries is achieved promptly for its entry into force. It is the first United Nations world convention on higher education. It is an instrument that establishes universal principles for the recognition of degrees across borders that will facilitate the academic mobility of students, teachers, researchers, and learning at the international level, guaranteeing that academic achievements are equitably evaluated and recognized on the basis of solid quality assurance mechanisms that allow people to continue their studies and / or seek employment opportunities abroad. Regional agreements, including that of Latin America and the Caribbean, adopted on July 13, 2019 in Buenos Aires, will have similar application once they enter into force.

### **Role of Stakeholders in Higher Education During the Covid-19**

Although, it is important to establish a reference framework that helps decision-making processes in the higher education sector in Nigeria, without forgetting that the first priority must be the protection of health. For UNESCO, this reference framework should start from the following principles:

1. Ensuring the right to higher education of all persons within a framework of equal opportunities and non-discrimination is the first priority and, therefore, all political decisions that affect, directly or indirectly, the education sector superior should be governed by this right. The primary responsibility for ensuring that this right is exercised in practice rests with the States that must generate adequate regulatory, financing and incentive frameworks, as well as promoting and supporting inclusive, relevant, adequate and quality programs and initiatives.
2. Leave no student behind, in line with the main purpose of the United Nations Sustainable Development Goals. The crisis has a different impact on different student profiles, but it is undeniable that it deepens existing inequalities and generates new ones. It is imperative to attend, as a priority, to the pedagogical, economic and also socio-emotional needs of those students who, due to their personal or socio-economic characteristics, may have had or have greater difficulties in continuing their training in non-traditional modalities.
3. Review current regulatory frameworks and policies, to ensure structural measures that see education as a continuum where educational trajectories must be strengthened from early childhood to higher education and beyond, thus minimizing the fragility of the most vulnerable students in reaching higher education.
4. Prepare in time for the resumption of face-to-face classes, avoiding having to rush and offering, from the beginning, clarity in communication to the entire academic community and administrative and academic security, so that teachers, administrative and service personnel, and students can place themselves in the new context knowing in advance the provisions, processes and mechanisms designed to resume teaching activities.
5. The resumption of face-to-face activities of higher



education should be seen as an opportunity to rethink and, to the extent possible, redesign the teaching and learning processes, taking advantage of the lessons that the intensive use of technology may have entailed, paying special attention to equity and inclusion.

6. Governments and stakeholders in education should create coordination mechanisms that allow joint progress to be made in generating greater resilience in the higher education sector in the face of future crises, whatever their nature. It is absolutely essential to involve students, teaching and non-teaching staff in designing the responses that emergency situations demand.

### Conclusion

Finally, higher education will have missed a great opportunity if they do not stop to reflect internally, with the participation of students and teachers, about the lessons learned during the crisis about the teaching and learning processes. The critical question is whether the acquired experience can be capitalized for a redesign of these processes, maximizing the advantages of face-to-face classes while making the most of technologies, and, secondly, how far does each institution want or can go. This reflection may be concretized if higher education has innovation and pedagogical support offices whose role, in addition to developing the pedagogical competences of teachers, is to promote pedagogical innovation and accumulate and disseminate the findings resulting from their evaluation. We usually say that in every crisis there is always an opportunity. Perhaps, in this case, it is an opportunity for a pedagogical review. It is therefore expected that many higher educations will undertake the path of a necessary pedagogical renewal that favors both quality and equality.

### Recommended strategies and measures

The implementation of the above principles can adopt different strategies depending on the contexts and take advantage of the lessons learned from educational planning for the exit from a crisis situation (UNESCO, 2020)<sup>[10]</sup>. It is clear, however, that there are a number of controversial areas in which different alternatives are offered and which are below, suggesting strategies at the national and institutional level.

### National strategies

States have a fundamental responsibility to guarantee the right to higher education. In the context of the progressive exit from the crisis, governments should consider at least four vectors: the role of higher education in recovery; the need to forge national consensus; the establishment of a clear regulatory framework; and, finally, the promotion of international cooperation.

The slowdown in the Nigeria economy alone would mean a decline in the value of exports to

10.7% for its main trading partners. Added to the above is the greater risk aversion of international investors and the worsening of global financial conditions, a situation that will have an impact on national development plans in which all educational proposals are included, including higher education. The magnitude of the economic impact of the pandemic will depend on how long it lasts over time, given that "for each month of confinement there is a loss of 2

percentage points in the annual growth of GDP" (OECD Secretary General, 23 March 2020).

On an economic and financial scale, the post-crisis context will require governments to take measures to revive the economy, including stimulus packages. But, in addition, countries must also meet food and health needs, which will translate into a strong tendency to reduce public spending on education, especially in those countries where public debt was already worrying, even before the crisis. The education sector and, in particular, that of higher education must be seen as a tool in a context of economic recovery and, as such, must be an integral part of the stimulus programs that are designed. In particular, the needs of a foreseeable growth in the demand for higher education in the medium term must be met, while efforts to redress the impact of the impoverishment of a significant part of the population due to the pandemic (which the ECLAC estimates will be 35 million people in the region) may have equal access to higher education. A significant part of the resources must go to higher education, which will have suffered the effects of the loss of fees, and another substantial part to financial support for the most vulnerable students, regardless of the sector, public or private, in which they are enrolled.

### Forge a national consensus for a strategy for fostering recovery and innovation in higher education

Governments, university council presidents, quality assurance agencies, and national education councils, with the participation of academic staff and nonacademic staff unions and student organizations, should forge a consensus on a national exit strategy, as soon as possible, for the crisis facing higher education. This strategy should not only promote recovery, where the impacts of the crisis have been felt the most, but promotion of innovation, reflecting on the validity of the traditional model of higher education. Such a strategy should contemplate:

1. Shared principles and guidelines to guarantee the protection of the right to higher education.
2. Measures to support higher education to support their efforts in diagnosing, compensating, and validating student learning achievements.
3. Mechanisms to strengthen the resilience of HEIs in the face of future crises, with special attention to developing their technical, technological, and pedagogical capacities to appropriately use non-face-to-face methodologies, as well as their abilities to monitor students, particularly the most vulnerable.
4. A national debate on the lessons learned from the crisis for higher education, taking advantage of international debates and experiences and helping to generate, whenever possible, regional and international consensus and agreements.
5. Shared and effective communication of messages to public opinion. also the learning of lessons obtained, as well as the.

### Provide a clear regulatory environment for the reopening of classrooms that promotes a sense of security

The exceptional situation experienced by all actors in higher education invokes many uncertainties about what will happen when higher education are reopened for classroom teaching. It is very important that, in the context of a national consensus, the measures to be taken to safeguard

quality and equity in higher education be announced as soon as possible. With maximum transparency and dissemination, the aim is to offer a regulatory framework that offers security in those areas that generate the most controversy. Specifically:

1. Should exams to access higher education be postponed? In those countries where the duration of the pandemic affects the schedule of the entrance examinations, it is preferable to postpone them until the latest possible date. Should this not be possible, alternative assessment mechanisms would apply (for example, the exam grade can be based on the average of qualifications obtained in the most recent courses), or the exams can be conducted using technological platforms, which is quite complex. The complete removal of the exam requirement can prejudice a whole generation of students. The option of designing innovative formulas should not be ruled out. One option, which has been proposed in Nigeria, is to use the achievements obtained during upper secondary school, to predict the grade that would have been obtained, leaving the student to resort to a second call to improve the result obtained by this prediction. This is a traditional practice in the State of Texas, USA, and increasingly in Chile and other countries. In all cases, studies show that its use has a high predictive capacity to select the best students in their contexts. In doing so, these mechanisms contribute directly to the objective of inclusion and equity since they select the best without discrimination based on socioeconomic, ethnic, gender or any other characteristics that represent prohibited grounds of discrimination.
2. Co - curricular activities, which Rectors of Nigeria higher education have proposed to be considered fully completed if at least 50% was achieved before the suspension of the face-to-face activities. Particular mention should be made of students in health and education sciences, since their typical practical requirements are unlikely to function normally until well after the period of confinement has ended;
3. The academic calendar, particularly if the term has ended. In this sense, should a repeat be encouraged? In the event that the cessation of classroom activities is close to or exceeds an academic term, the debate on the repetition of the course will come up. This option should be ruled out because neither the students nor the system will benefit. On the contrary, attention should be focused on compensatory and validating mechanisms and, eventually, an extension of the duration of the academic year.

### **Learn from mistakes and scale - up digitization, hybridization and ubiquitous learning**

Many countries have made the mistake of relying exclusively on online education, which only ensures continuity of learning opportunities for students that have access to good connectivity. Resorting to technologies that require stable bandwidth connectivity significantly impacts the more vulnerable sectors. Internet access is not always possible and when it is, connectivity is often lacking. The classes that are transmitted in streaming, for example, are more difficult to access due to the amount of data they use and the quality of connectivity required. In this sense, virtualization especially impacts socially and economically

disadvantaged students who have only recently benefited from the processes of democratization and mass enrollment in higher education. If virtualization is to be the main educational tool to sustain the functioning of education, the enormous digital divide must be taken into consideration. Its existence must be recognized, not to reject virtualization, but to design strategies and support mechanisms that will help combat it even more intensely.

Thinking now about the future, it is necessary to start from the principle of realism and generate strategies that do not rely only on a single technology, but on several to ensure that all students are taken into account or, which is equally or more important, that technological solutions do not harm those who are already disadvantaged. Every higher education, and probably every discipline, must find the most appropriate combination of technologies and resources to improve the pedagogical impact. We do not need to think about possible future crises to have a diversified approach to the use of technologies in higher education. It is enough to conduct an exercise in realism applying the principle that more efforts should be invested in those technologies, teaching resources and supports that are within the reach of all, to improve the quality of face-to-face teaching and promote hybrid methodologies; in other words, they combine the best of face-to-face with the potential of technology to support pedagogical renewal and improvement.

At the same time, within the framework of national public policies and with the support of industries and telecommunications companies, innovation must be promoted, taking advantage of the potential of digitization to concretize the principle of ubiquitous or mobile learning, and its advantages for higher education. This has been addressed in multiple studies (Aljawarneh, 2019; Pimmer, Mateescu, & Gröbriel, 2016)<sup>[1, 6]</sup>. In real terms, this implies:

1. Recognition of the potential of cell phones as communication and learning tools, as well as a tool for accompaniment and the socioemotional monitoring of their students. In most countries, higher education students have the device, even though sometimes with very basic configurations, but their pedagogical use has in many cases been rejected.
2. Promotion of the improvement of the conditions for accessing equipment and, above all, mobile connectivity packages that make it easier for students and teachers to improve their technological capacity. In this sense, the cost of connectivity is critical to promoting mobile learning. In some countries, particularly in West Africa, some telecommunications companies offer free use of data for educational applications and services. In Nigeria, the two main telecommunications companies have pledged to do so. This is a possibility that governments should promote at the national level.
3. Retrieve radio and television programs and digitize them so that they are accessible through educational channels and, alternatively, also as podcasts.
4. Using low-cost technologies, explore the possibility of recording face-to-face classes that are duly archived and made available at the resource centers or libraries of the higher education. There are many lessons to be learned from the experience accumulated with MOOCS.
5. Develop the capacities of teachers, offering appropriate

incentives and support, using technological solutions and resources that can improve the quality of their work.

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