

COVID-19 and higher education: Today and tomorrow

Impact analysis, policy responses and recommendations

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Preface

In the interest of contributing to the improvement of the quality and equity of higher education, the UNESCO International Institute for Higher Education in Latin America and the Caribbean (IESALC) has prepared this report on the impacts of COVID-19 on higher education. While it focuses primarily on the Latin American and Caribbean region, some of the strategies and research findings addressed apply also to other regions. The analyses and recommendations included are primarily intended for policy makers at both the systemic and institutional level, for whom the content of this report should provide valuable information for decision-making in the short, medium and long term.

In the first instance, the report highlights the immediate impacts of the pandemic on the university higher education sector, both for the different actors and for the institutions and the system as a whole. Some impacts, which are not immediately visible, are unfortunately very significant and will surface in the medium and long term. Secondly, it reviews what actions governments and higher education institutions (HEIs) have taken to guarantee the right to higher education during the pandemic. Finally, it considers various scenarios, and offers some observations and recommendations with regard to the reopening of HEIs, and highlights the importance of initiating preparations at the earliest.

This report was written by the IESALC technical team. The process was led by Francesc Pedró, who designed and coordinated its preparation, with the participation of José Antonio Quinteiro, Débora Ramos and Sara Maneiro. The first draft benefited from many valuable contributions. The IESALC team wishes to express its appreciation to the members of its Governing Board who made important contributions to the report: Luis Bonilla-Molina (Venezuela), Ligia Amada Melo de Cardona (Dominican Republic) and Rutilia Calderón (Honduras). The following colleagues from UNESCO are also recognized for their comments: Lidia Arthur Brito, Director of the UNESCO Regional Office for Science in Latin America and the Caribbean; David Atchoarena, Director of the UNESCO International Institute for Lifelong Learning (UIL); Saba Bokhari, Program Specialist at the Nairobi Regional Office, Kenya; Borhene Chakroun, Director of the Division of Lifelong Learning Policies and Systems; Vibeke Jensen, Director of the Education for Sustainable Development Division; Paz Portales, Program Specialist in the UNESCO Higher Education Section; and Claudia Uribe Salazar, Director of the UNESCO Regional Office for Education in Latin America and the Caribbean (OREALC). Important contributions were also received from Daniel Mato, Director of the UNESCO Chair in Higher Education and Indigenous and Afro-descendant Peoples in Latin America at the National University of Tres de Febrero (Argentina), Norberto Fernández Lamarra, Director of the UNESCO Chair in Education and Future of Latin America at the National University of Tres de Febrero (Argentina), as well as Cristian Pérez Centeno, Marisa Álvarez and Pablo García, members of his team. Finally, the report was reviewed and completed by renowned specialists in public policy on higher education: Elena Arias Ortiz, Senior Specialist in the Education Division of the

Inter-American Development Bank (IADB); Aliandra Barlete, Researcher in the Faculty of Education, Cambridge University (United Kingdom); Ana Capilla Casco, Coordinator of Higher Education, ETP and science at the Organisation of Iberoamerican States (OEI); Jorge Calero, Professor of Applied Economics at the University of Barcelona (Spain); Margarita Guarello, Director of Continuing Education at the Pontificia Universidad Católica de Chile (Chile); Francisco J. Marmolejo, Education Advisor, Qatar Foundation (Qatar); Axel Rivas, Director of the School of Education of the University of San Andrés (Argentina); and Josep M. Vilalta, Director of the Global University Network for Innovation (GUNi). UNESCO IESALC acknowledges its indebtedness to all these persons and their institutions.

In the current circumstances, where so many variables have yet to be defined, this document must be seen as one in permanent construction. UNESCO IESALC will update this document as new ideas and initiatives arise, to encourage knowledge sharing and international cooperation.

Executive Summary

This report prepared by the technical team of the UNESCO International Institute for Higher Education (IESALC), in the first instance, highlights the immediate impacts of the pandemic on the university higher education sector, both for the different actors and for the institutions and the system as a whole. Some impacts, which are not immediately visible, are unfortunately very significant and will surface in the medium and long term. Secondly, it reviews what actions governments and HEIs have taken to guarantee the right to higher education during the pandemic. Finally, it considers various scenarios, and offers some observations and recommendations with regard to the reopening of HEIs, and highlights the importance of initiating preparations at the earliest.

The current impacts of the crisis on higher education are easily documented, but it is debatable which ones will leave their mark on the different actors in the medium and long term. Lack of references to similar crises in the past makes it difficult to predict what may happen in the immediate future.

For the students the most immediate impact has naturally been that the temporary cessation of face to face teaching at HEIs has left them, particularly undergraduates and those who are about to finish upper secondary and aspire to enter higher education, in a completely new situation, without a clear idea of how long it will last, immediate impacts on daily life, costs incurred and financial burdens and, of course, learning continuity and international mobility.

Teachers are also impacted significantly at the workplace and professionally. First, the fact that not all HEIs have strategies for the teaching continuity activity must be taken into account, and in this instance, temporary contracts may be terminated. Also, the most evident impact on teachers is the expectation, if not the demand, of the continuity of teaching activity using a virtual modality.

Non-teaching staff constitute the most vulnerable sector in terms of the possible reduction in the number of jobs that private universities, for example, would have to effect in the face of possible financial curtailment due to the cancellation of fees or reduction in student enrollment.

It is clear that the temporary cessation globally of face- to- face activities has been a huge disruptor of the functions of HEIs. The impact of this disruption is highly variable and depends, first, on their ability to remain active in their academic activities and, second, on their financial sustainability.

In the event of a long duration of the cessation of face-to-face activities, that is, the equivalent of a quarter or more, it is most likely that there will be a decline in demand in the short term and a spike in the next academic year where fees are non-existent (as in Argentina) or very affordable.

It is too early to estimate the future profile of the higher education offer.

Probably, if the entire offer were public, it would be easy to predict that the number of centers and programs would hardly decrease. However, public HEIs will reopen in an already fullblown economic recession and major cuts in public investment in education are expected, such as those experienced during the 2008 financial crisis. In the case of private HEIs, it is possible to anticipate crises that will lead to definitive closures.

In terms of policy responses, countries have tended to limit themselves to three areas:

- a) administrative measures to safeguard the operation of the system;***
- b) financial resources; and***
- c) the provision of resources to continue training activities.***

From the beginning, institutional responses have covered different areas: the strictly health front, the adjustment of calendars, research and development contribution to mitigate the pandemic, the guarantee of continuity of teaching activities through distance education, bibliographic and technological resources as well as socio-emotional support to the university community.

Although, at this point, the schedule for the reopening of HEIs may seem uncertain or indefinite, this is an opportunity to better plan the way out of the crisis, within an appropriate reference framework. For UNESCO, this reference framework should be based on the following principles:

1. ***Ensuring the right to higher education for all within a framework of equal opportunities and non-discrimination as the first priority and,*** therefore, all policy decisions that affect the higher education sector directly or indirectly, should be directed by this right.
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 students, but it is undeniable that it deepens existing inequalities and generates new ones.
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 higher education.
4. ***Prepare in time for the resumption of face-to-face classes,*** avoiding having to rush and from the very beginning , clear 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 HEIs 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 HEIs 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 may be. It is absolutely essential to involve students, and teaching and non-teaching staff in designing the responses that emergency situations demand.

In application of these principles, and in the context of the progressive exit from the crisis, governments should:

1. ***Include higher education in the stimulus plans for economic and social recovery;***
2. ***Forge a national consensus for a strategy for fostering recovery and innovation in higher education;***
3. ***Provide a clear regulatory environment when reopening of classrooms that generates security; and***
4. ***Commit to international cooperation.***

For their part, HEIs should:

1. ***Anticipate a long-term cessation, focusing efforts on ensuring teaching continuity and guaranteeing equity, generating governance mechanisms, monitoring, and efficient support;***
2. ***Design pedagogical measures to evaluate training and generate mechanisms to support learning for disadvantaged students;***
3. ***Document the pedagogical changes introduced and their impacts;***
4. ***Learn from mistakes and scale up digitization, hybridization and ubiquitous learning; and***
5. ***Promote internal reflection on the renewal of the teaching and learning model.***

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). 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.

Currently, the temporary closures of higher education institutions (HEIs) due to the COVID-19¹ pandemic are no longer news, because most countries have stopped face-to-face teaching. The UNESCO IESALC estimates, reflected in the figure below, show that the temporary closure affects approximately 23.4 million higher education students (ISCED 5, 6, 7 and 8) and 1.4 million teachers in Latin America and the Caribbean; this represents approximately more than 98% of the region's population of higher education students and teachers.

As Figure 1 shows, the suspension of face-to-face activities has been extremely rapid in the region: it began on March 12 in Colombia and Peru and, in a matter of six days, affected almost the entire population of higher education students and teachers in the region. By March 17, the figure of 21.7 million students and 1.3 million teachers affected by the temporary closures had already been reached.

¹ Acronym of English *Coronavirus Disease 2019*.

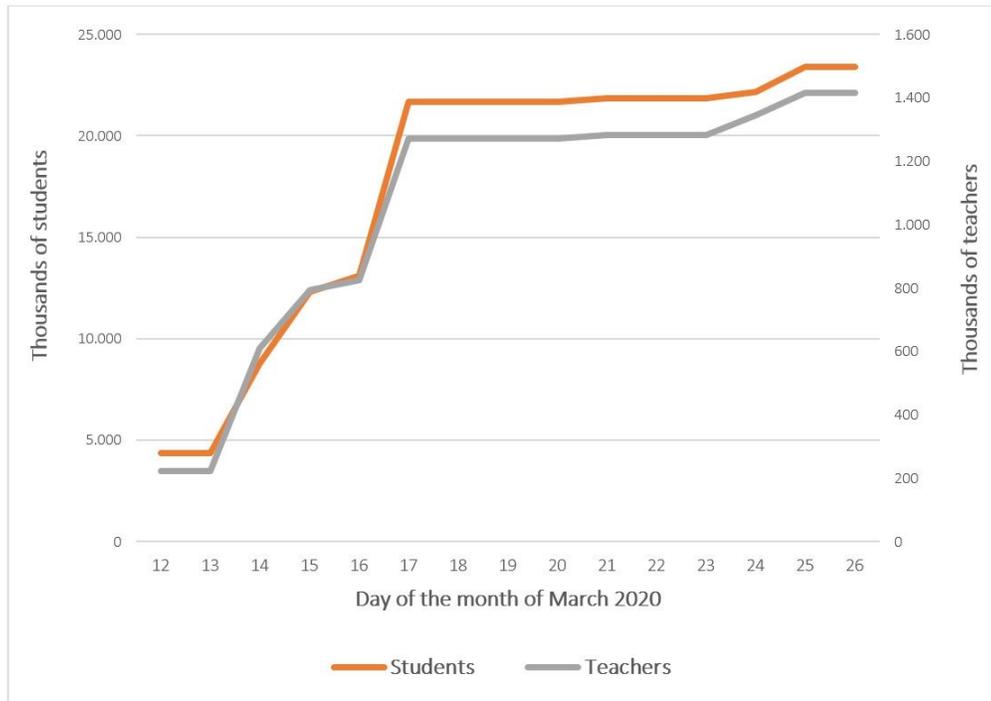


Chart 1. Estimate of the accumulated number of students (GiNi 5, 6, 7 and 8) and teachers affected by the suspension of face-to-face classes during the month of March 2020 in Latin America and the Caribbean (in thousands).

Source: UNESCO IESALC estimate.

The decision to temporarily close HEIs was prompted by the principle that large gatherings of persons constitute a serious risk to safeguarding public health during a pandemic. HEIs and indeed all educational institutions tend to close their doors in situations where some form of confinement or quarantine has been legislated. In Europe today, the only country not following the recommendation to suspend classroom activities is Sweden. In the United States, state authorities have mandated closure but the vast majority of campuses had already closed, particularly those of large public and private universities had closed weeks before the government's intervention. As the pandemic spreads, which seems inevitable, the remaining countries will also institute mandatory measures to suspend face-to-face activities for all educational institutions.

In Latin America, confinement or quarantine measures were taken almost immediately and, in some cases, with a long-term perspective. For example, in Argentina the suspension of face-to-face classes was recommended on March 14; in Chile, full quarantine in some districts resulted in the massive closure of HEIs as of March 16; in Colombia, all HEIs were closed following the health emergency decree of March 12 which is expected to continue until May 30; in Cuba, HEIs were closed on March 25 for an indefinite period; in Peru, face-to-face classes were suspended on March 16 initially for 15 days but this has now been expanded to 30 days; in El Salvador classes were suspended for 30 days

until further advice on March 11; in Uruguay, the University of the Republic ordered the cessation of classroom activities on March 15 also for close to 30 days; in Venezuela a state of emergency was proclaimed on March 13, initially for 30 days. To date, in the region only some HEIs in Brazil and Mexico appear to be open.

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.

While the impact of the pandemic on HEIs 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.**

1. 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 HEIs 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).

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 socio-emotional 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 hardy 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).

A similar situation is the one experienced in South Korea, where the annual fees are much higher as is the case of large HEIs in the United States, and more so for postgraduate studies. There are requests by students who paid USD 60,000 or more for an academic year and whose face-to-face classes have been suspended, for their tuition fees to be returned. A recent survey² shows that 43% of MBA students from the 20 most prestigious business schools in the country are convinced that, with the change to online classes, they should get back at least a third of what they paid, largely because the adopted modality includes exchanges of knowledge and perspectives among participants for the creation of a professional network. What is more, Forbes³ estimates that the investment required for a year of study in one of these business schools can reach a quarter of a million dollars, including the opportunity cost.

Part of the reason for the request is the fact that many students have loans that they have to continue to pay and, in many cases, the rental of the room at the campus residence, which they must continue to pay, regardless of whether they continue to live there or not. There are some HEIs, like the one in Glasgow, however, which have already announced that they will not charge those students who have returned their keys, beyond the first month. Some English HEIs have proposed that instead of returning the fees already paid, they will credit them to the next academic year.

² <https://poetsandquants.com/2020/03/29/pq-survey-a-third-of-admits-may-defer-while-43-want-tuition-lowered-if-classes-are-online/>

³ <https://www.forbes.com/sites/poetsandquants/2020/03/30/should-colleges-discount-tuition-because-of-the-shift-to-internet-classes/>

At this time, there is no country in the region where a moratorium or a suspension of fees has been offered, largely based on the double assumption that this is only a short-term temporary situation and that, in any case, the continuity of the classes is guaranteed by alternative modalities. In many public universities, fees are paid in full at the beginning of the academic year, but in the case of private universities, particularly those with high fees, the payments are distributed throughout the course. There is no record, at the moment, of the suspension of these payments anywhere.

Similarly, no measures have been taken to favor the moratorium or temporary suspension of payments on students' loans and credit installments.

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).

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. Figure 2 shows, 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.

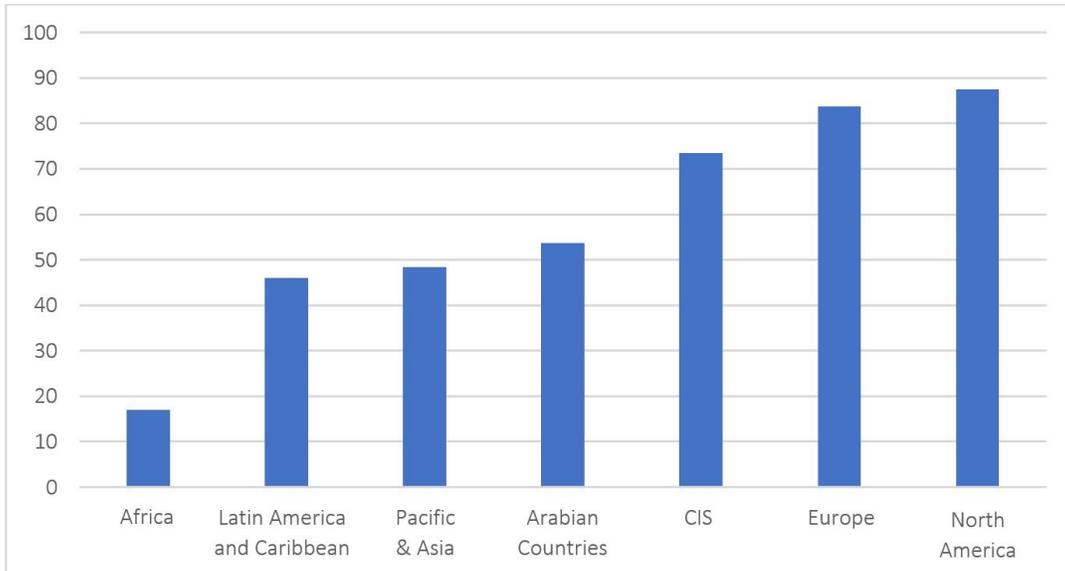


Chart 2. Percentage of households with internet connection by region (2018).

Source: Database of the International Telecommunication Union, 2020.

Although we can assume that households with a higher education student are more likely to have connectivity, it would be very risky to assume that all students when they return home have effective connectivity. Figure 3 illustrates the paradox that, despite the fact that the rate of connectivity in households is very disparate in Latin America, with extreme cases in Chile and Bolivia, the rates of mobile lines are extremely high and exceed, in many cases, the figure of one line per person. This is, without a doubt, an opportunity that HEIs should take advantage of, focusing their efforts on technological solutions and content for use on mobile phones.

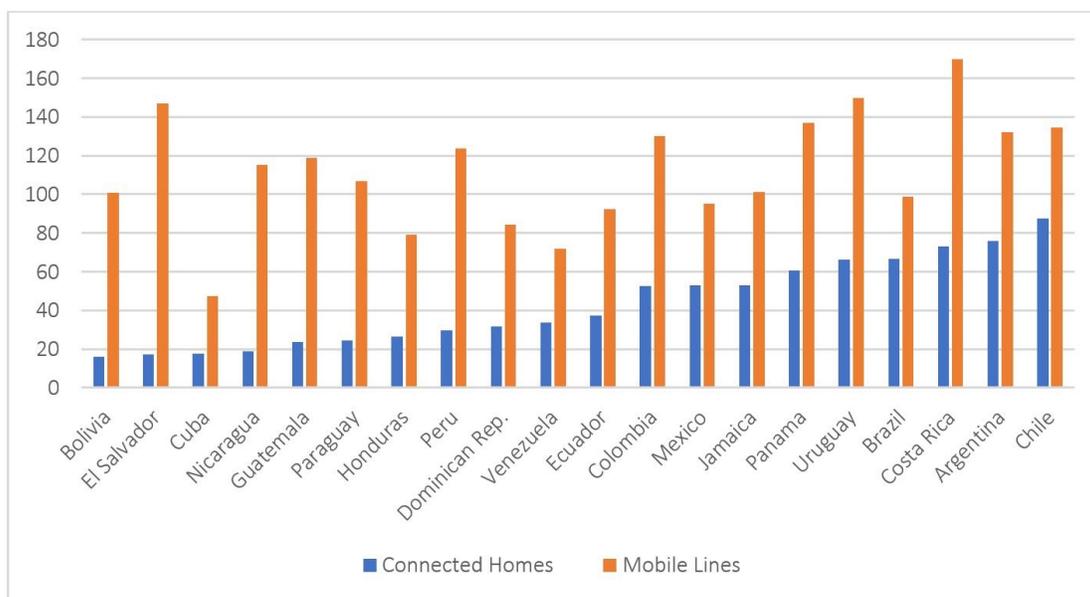


Chart 3. Percentage of households with internet connection and mobile lines per 100 inhabitants in a sample of countries in Latin America and the Caribbean (2018).

Source: Database of the International Telecommunication Union, 2020.

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 mobility

Since January 2020, the spread of COVID-19 has affected the global travel of thousands of students. Since late February 2020, travel restrictions to various locations, including China, Iran, South Korea, and Italy, and later Argentina, Brazil⁴, Spain, Panama, and Venezuela, to name but a few, have impeded the flow of international students, faculty and university staff around the world.

In 2017, the Organization for Economic Cooperation and Development (OECD) estimated that more than 5.3 million students were studying outside the territories of which they were nationals, with China being the number one sender of students (928,000) globally. According to estimates by The Times Higher Education, the impact of COVID-19 will likely be settled, with some 80,000 fewer Chinese students entering the United States, 35,000 in the United Kingdom, and approximately 30,000 in Australia⁵. This impact will result in a differentiated way depending on the country in question, but for Australia, with 1,774,852 million students enrolled in higher education and 29% of them foreign (514,707)⁶, the contingent of Chinese students represents 20% of budgetary income from Australian universities. It can be estimated that in the three major recipient

⁴ As of midnight 28 March 2020, Brazil barred all incoming flights to the country, due to the global spread of the Coronavirus.

⁵ “Global higher education set to count cost of coronavirus outbreak” *Times Higher Education*, March 8, 2020, <https://www.timeshighereducation.com/news/global-higher-education-set-count-cost-coronavirus-outbreak>.

⁶ *Tertiary Education Quality and Standards Agency (TEQSA)*

countries (Australia, the United States and the United Kingdom) COVID-19 will bring billions of revenue losses and an incomparable crisis. Education is Australia's third largest source of income. In Latin America, where the reception of international students is very low (UNESCO IESALC, 2019), the economic losses will be marginal, by comparison.

Similarly, although in reverse, the Chinese government reported 81,562 African students in China in 2018, many of them attracted by generous government scholarships. About 5,000 are believed to have been in Wuhan at the time of the outbreak of the epidemic, as this city has a concentration of dozens of higher education establishments that offer highly regarded academic qualifications in Africa⁷. Although many students requested to be evacuated, Chinese authorities urged local embassies to tell their citizens not to seek to return home to prevent further spread of the disease. Doesn't an epidemic situation require maximalist responses? Most likely yes, but the forced stay causes an internal breakdown with an impact on psychological security, which is why there will be students who give up on their interest in pursuing studies abroad, regardless of whether they are inside or outside of it. The previous reference anticipates that many students will resign to continue their studies and academic stays interrupted not only by psychological affectations, but also by epidemiological restrictions, visas conditioned to the severity that the pandemic exhibits in their respective countries, to the limited offer of commercial flights, as well as for economic reasons since the support funds from their countries of origin have also been decreased or canceled.

The ERASMUS Program, the banner of European academic mobility, also hints at significant impacts from COVID-19 as Europe becomes the new epicenter of the pandemic. Of the 800,000 students mobilized in the 2016/17 academic year, Spain ranked first as a recipient country (47,138), followed by Germany (34,922), the United Kingdom (31,362), France (30,145) and Italy (23,924)⁸. At the time of writing this report, all these countries are on health alert. As the pandemic continues its exponential course of spread, the higher education institutions consortium to the ERASMUS Program will remain closed and, consequently, academic mobility will remain below minimum (73% of outgoing mobility has been affected in the European Higher Education Area).⁹

In the United States, the impact of COVID-19 has been announced as brutal. Many of the country's most prestigious international universities are located at epicenters of the pandemic: Columbia University (New York), Princeton

⁷ "African students stranded in coronavirus heartland plead with embassies" *The Guardian*, Feb 4, 2020, <https://www.theguardian.com/world/2020/feb/04/african-students-stranded-in-wuhan-coronavirus>.

⁸ https://ec.europa.eu/programmes/erasmus-plus/about/statistics_en

⁹According to a survey conducted by the European Association for International Education between February 19 and March 6, 2020, with a total of 805 responses.

University (New Jersey), Stanford University (California), CalTech (California), and others. Being research and attraction poles par excellence for global academic mobility, their closure is a serious blow to incoming academic mobility in the United States - the first receiving country in the world. In fact, the US State Department has suspended visa application services, including student visas, at most of its embassies since the end of March, so it only provides services for its citizens and issues emergency visas at this time. Three-quarters of HEIs in the United States have already reported a negative impact of student enrollments from China, which typically made up about 34% of international students in the country. A similar impact seems to have already taken place in Australia, Canada and New Zealand. Conversely, China's plans to become the top international destination for higher education students in a decade has also been questioned.

Latin America and the Caribbean, a geographic block in which more students are mobilized to other regions, particularly the United States and Europe, than those who move from other countries to this region, also faces major impacts from COVID-19. Numerically, the countries from which the largest contingents of students leave are, in order of magnitude, Brazil, Colombia, Mexico and Peru and the country that receives the largest number is Argentina (UNESCO IESALC, 2019).

The crisis will have great impacts on the world economy and, inevitably, on inequalities. Consequently, any mobility decision will be made more conscientiously than in the past, especially in those cases that do not have public funding. It should be remembered that 95% of Chinese students studying abroad in 2012 did so with their own resources, while 48% of Mexican student mobility for the 2015-2016 period was financed by the respective families (Maldonado, Cortés, & Ibarra, 2016). At the same time, this crisis could increase the number of displaced populations in search of opportunities, an issue that will pose enormous additional challenges.

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.

B. Faculty

Although the focus is always placed on the impacts on students, teachers also suffer significant impact at work and professionally.

Firstly, we must take into account that not all HEIs have continuity strategies for teaching activity and in this circumstance, temporary contracts may be terminated. In many countries, full-time university teaching is not common and most teachers have part-time contracts. Also, the cessation of face-to-face teaching activity looms as a threat to those teachers whose contracts focus exclusively on teaching complementary classes, such as practical classes or seminars, and who are frequently part-time and considered an auxiliary or peripheral complement, if not included in students' options. Measures to protect economic activity, favoring, for example, mechanisms for the temporary regulation of employment, can be negotiated for a certain number of these contracts, both in the public and private sectors, which in principle, means temporary suspension. However, in the event that the situation continues, these suspensions could be long and, additionally, it is possible that the upsurge in the use of the virtual modality could put the return to the previous situation at risk.

The most evident impact on teachers is the expectation, if not the requirement, that they continue to teach using the virtual modality. In theory, at least, virtual education is present in most large HEIs and it is difficult to find one that does not have a virtual campus and, within it, a virtual classroom for each subject, as an extension of the physical classroom. In practice, the ability of each teacher to continue teaching largely depends on their experience in that regard. We must also consider that those subjects which include the development of professional competences through practice (clinics, pedagogical residencies, design careers, engineering, science and generally all those heavily dependent on practical workshops, laboratory work or institutional practices) are a source of greater uncertainty, which will lead to a set of different impacts on the system of the individual university. Mathematics generally presents more difficulties in the virtual adaptation process.

Teachers with significant experience in the field gained, for example, through distance graduate programs and appropriate digital resources, probably do not have great difficulty in ensuring continuity. In any case, we must not ignore the fact that the learning curve for the efficient use of technology in distance higher education is very steep and requires external support in the technological and pedagogical fields. For the other remaining teachers, who represent the majority, the simplest option is to transmit class sessions by video, live or delayed. This is where teachers can see the difference between those HEIs that make tools and resources available to them, such as training courses, and those that do not.

In Latin America and the Caribbean there is a large contingent of universities that have virtual education programs, with great variability in quality and also in completion rates. Other HEIs, located in more remote areas of the countries, do not have a broad-spectrum Internet service and even some do not even have basic connectivity services. Many students from rural areas in countries like Argentina, Bolivia, Colombia and Peru and who have returned to their homes now find themselves with worse connectivity conditions than they had in their urban homes near the HEIs where they study. Meanwhile, the abrupt interruption of face-to-face activities now depends on a digital environment that many have had to get used to in a matter of days, evidencing a disparate use of virtual education, in terms of the use of different technological tools and supports (adequate infrastructure, both in apps and platforms) necessary to manoeuvre distance learning processes mediated by technologies, as well as diversity of access to connectivity (including the provision of servers appropriate for the required telematic workload and provision of the bandwidth necessary to connect) for the online learning teaching process to flow effectively. This variability therefore has to be balanced with the risk that the digital divide may widen the academic gap.

Recent developments -especially in the cases of Argentina and Brazil - point to pressure from teacher unions to prevent or hinder the transition to online education, arguing that it does not have the same quality, but basically this has been due to the concern of the possible layoffs or reductions in salary benefits for their members. There are universities, for example, one in Buenos Aires which has officially announced that although they will do their best to offer online resources, their choice will be to subsequently reprogram the face-to-face offer.

The closure of universities has accelerated an abrupt entry - as the UNESCO¹⁰ Director-General has pointed out - into a new era of learning. The demand for the almost immediate digital transformation of HEIs not only requires the incorporation of technologies, but also requires the creation or modification of processes and the availability of people with the appropriate capacities and skills to develop said processes and technologies. However, since there was no more time to prepare these conditions, teachers have been challenged to find the creative and innovative resolve to act and learn on the go, demonstrating

¹⁰ https://youtu.be/St_BQRSXmew

adaptability and flexibility in the contents and designs of the courses for learning in the different training areas.

Along with the teaching activity, which is now the source of a great deal of tension, there are those teaching staff who also have very important research tasks and some who manage university outreach. Both these tasks have been suspended. In the case of research, only bibliographic research (desk research) can have some continuity.

C. Non-teaching staff

The situation of non-teaching staff, in administration and services, is equally risky when their main tasks are not considered critical to the continuity of teaching. Thus, for example, the personnel linked to technical and computer support belong to the critical category, different to the personnel who work in canteens, dining rooms or cleaning services. In all these cases, it will be the measures taken by the governments in terms of employment and social protection that will set the tone. It is also the most vulnerable sector in terms of the possible reduction of jobs that private universities, for example, would have to implement in the face of possible financial stringency due to the cancellation of fees or reduction of student enrollment.

D. Higher education institutions

It seems clear that throughout the world the temporary cessation of the face-to-face activities of HEIs has been a huge disruptor of their functioning. The impact of this disruption is highly variable and depends, firstly, on their ability to remain active in their academic activities and, secondly, on their financial sustainability.

The efforts made to continue teaching courses in virtual mode have been notable everywhere and, given the lack of experience with similar situations in the past, the transfer has not been easy. HEIs also may or may not have sufficiently mature virtual education systems and, even in the best case scenario, it is difficult to think that they can be scaled-up to the necessary dimensions without the intervention of external technical supports such as video servers, for example. In short, it is one thing to have the necessary technological and technical infrastructure to support virtual courses for a relatively significant percentage of graduate students. It is quite another, much different, to provide the technical and technological needs for generally all courses for all students in a timeframe that, in many cases, has been less than a week. The effort made is clearly titanic.

However, alongside the vector of change in training modality, there is also the vector of financial sustainability. A large number of public HEIs depend - although to a lesser extent than private ones - on partial contributions from students. A case in point is that of Chile, Colombia, Peru and most of the public universities in Mexico. This implies that many of these universities, even if they

are public, would face serious financial difficulties. Cash flows may not be enough, creating cash flow problems and, perhaps even financial survival, particularly in the case of private HEIs which cannot open in a quarter. This can be especially critical for small or medium-sized private universities that cannot guarantee continuity of training in virtual mode. In these cases, if the situation continues, it is very likely that, failing to offer teaching, they will have to temporarily suspend the collection of fees. In such a context, it is also possible that larger private HEIs attempt to capture these now orphaned students. In this scenario, many HEIs may need to close.

E. The system

Higher education systems, as a whole, have reacted in a solidary manner and practically at a global level, have acted uniformly: they have continued teaching using pedagogical modalities that do not require physical attendance. The doubts arise when one begins to hypothesize about the likelihood of a prolonged duration of this exceptional situation. Should this be the case, the effects on the system will be multiple. These are addressed in the next section from a demand and supply perspective and take into account the additional challenges for governance.

On the Demand side

In the event of the extended duration of the cessation of face-to-face activities, that is, the equivalent of a quarter or more, it is most likely that there will be a reduction in demand in the short term and a spike in the next academic year where fees are non-existent (as in Argentina) or very affordable.

In the short term, there will be a number of students who will no longer return to classrooms and whose percentage is difficult to estimate. In the United States, it has been calculated, from a survey of undergraduate students¹¹, that one in six students will not return to campus when face-to-face activities are resumed; but also that four out of ten will continue taking distance higher education courses.

The reasons behind short-term withdrawal are multiple. The first and most fundamental will be of an economic nature, since the exit from the financial crisis will result in higher unemployment rates and many families will be impoverished. Additionally, it is very possible that a phenomenon of disaffection occurs with regard to HEIs. In other words, students who have not had an offer of continuity not only of quality, but with individualized follow-up, will probably disengage themselves from the academic cycle and increase their risk of dropping out. It is a well-documented phenomenon throughout decades of distance higher education (Cohen, 2017). The only remedy is individualized monitoring, which is probably not in the hands of all HEIs nor of all teachers. This monitoring is

¹¹ <https://www.artsci.com/studentpoll-covid19>

particularly important in the case of the most vulnerable students for whom this can make the difference between continuing their studies or abandoning them.

However, in the medium term, it is most likely that there will be a rebound in the demand for higher education that would be felt strongly starting the next academic year. The causes of this rebound are fundamentally exogenous to the sector and have to do with the phenomenon of seeking refuge in a context of economic depression. Many young people will request access to, or return to, higher education, particularly in cases where fees are low or non-existent, thus trying to position themselves in the face of the economic recession and the increase in unemployment, which will most likely be phenomena that will face in the coming years. Some HEIs have already seen an opportunity here and are offering their distance graduate courses at much lower prices than usual to stimulate demand, capturing the attention of new students. It remains to be seen what these students' behavior will be once normality returns.

It is foreseeable that part of this increase in demand, especially by those seeking re-qualification, will go in the direction of distance education which has been experiencing significant growth in the region for years. Specifically, the spread in this modality has risen 73% since 2010, while that of face-to-face is only 27%. In 2010, almost 2.5 million of the 21 million first-degree university students in the region registered for distance education, representing 11.7% of the total. In 2017, this teaching modality accounted for 15.3% of the total and was accessed by 4 million three hundred thousand students. However, the penetration of this modality is still incipient and is extremely disparate among the countries of the region, due to both the economic and social inequalities that affect access and permanence, as well as the digital divide, that is, unequal access to ICTs. In the region, Brazil is the country with the highest participation in distance learning in the undergrad degree in higher education. In 2017, 21.2% of enrollment was for face-to-face education, up from 14.7% in 2010. This form of teaching has also gained ground in Colombia, Spain and Mexico, where in 2017 it comprised between 18% and 14% of the students¹².

On the Supply side

It is too early to estimate what behavior the offer of higher education will have. Probably, if the entire offer were public, it would be easy to predict that the number of centers and programs would hardly decrease. Public HEIs will be reopening in a context of already full economic recession and it is to be expected that significant cuts will be made in public investment in education such as those experienced during the 2008 financial crisis. In fact, the social spending commitments made in the management of the pandemic crisis together with the decrease in tax revenues as a result of the reduction of economic activity, will force the reconsideration of some items of public spending. Although many countries may want to react not with adjustment

¹² Informe de Coyuntura n°6 del Observatorio de Ciencia, Tecnología y Sociedad de la OEI.

policies, but rather with stimulus packages, their financial capacity is likely to be limited for a certain time. The extent to which all or part of higher education activity is viewed as an opportunity to stimulate economic growth remains to be seen.

But, in many countries, the offer is mixed, public and private, and within it, there is profit and non-profit. In the same way that it is easy to see that in the case of the public offer there will be no changes in the number of HEIs, it is most likely that the private, for-profit and low-quality offer will have difficulty subsisting and will be doomed to a movement of consolidation and, consequently, of reduction of their number in the short term. On the contrary, in the medium term, the upturn in demand may lead to new growth in this type of supply as well, unless it offers drastic reductions in its tariffs. For its part, the supply of the highest quality private HEIs entails higher costs that can make them more vulnerable.

It is to be expected that there will be changes in the offer in terms of the teaching modality and that many universities that lacked distance-taught degrees decide to amortize the effort they are now making to expand their capacity to offer online programs.

Governance

Although the concept of a governance network is not new and its original meaning has little to do with the technological aspects (Dal Molin & Masella, 2016), confinement and quarantine have led to the emergence, due to the circumstances, of policy communication modalities that are probably more in line with the 21st century. Non-face-to-face governance mechanisms are also emerging that have great potential to become permanent governance formulas that are much more agile and efficient, thanks to technology.

To begin with, being forced to experiment with new forms of communication and governance has shown that the number of physical meetings can be drastically reduced without affecting the quality of decisions or being able to reach consensus among the different actors. Also, it is clear that the circulation of documents can be perfectly limited to digital circuits, also reducing the need for printing. In both cases, the direct economic savings, including the reduction in the number of trips and environmental impact, are clearly not negligible.

Outside of these two examples, are there other modifications that can promote agility and efficiency, resulting from experimentation forced by circumstances? Will changes in formats have an impact on governance mechanisms in the higher education sector?

2. Public policies and institutional responses

Once the decision has been taken to temporarily suspend classes, there is room for the development of public policies to assist all actors in facilitating the continuity of academic activity. In this section, we will first analyze what other measures have been taken to preserve the right to education and, second, how HEIs have created institutional responses to continue their educational activity despite their closure.

A. Public policies

One of the characteristic difficulties facing the higher education sector with regard to the development of public policies is that, with few exceptions, HEIs enjoy high levels of autonomy. In some countries, this is enshrined in the corresponding Constitution. For this reason, some countries where there is a federal government system such as Argentina, and where at the state level, there are also higher education competencies, in a situation where confinement provisions have not entered into force, not much can be done beyond establishing a series of recommendations. In other cases, such as in Brazil or Mexico, they have opted not to go further. Moreover, the exceptional nature of the crisis has also led to some proposals which would be totally impossible under normal conditions. For this reason, the New Zealand Parliament, in order to combat the crisis, has decided that the government would take control of all schools and universities in the country, a decision intended to facilitate urgent decision-making in the face of the emergency four-week closure of these institutions. Their Minister of Education will assume these emergency powers and issue the orders deemed appropriate, including those in relation to the change of teaching modality.

Under normal conditions, the sector's public policies require concerted mechanisms which depend on broad consensus that generally require time to achieve. This characteristic of the sector probably explains why it has been so difficult for countries to develop national contingency plans. However, it must be recognized that in almost all countries, these concerted efforts have been very well-received by university councils and HEI networks, both public and private. Both have actively participated in the configuration of coordination committees to assist with identifying the needs of HEIs to be able to ensure teaching continuity, share and update information and reach consensus on policy responses through ongoing consultation.

In fact, practically all countries have produced recommendations and guidelines for HEIs, some primarily geared to supporting the transition to a virtual mode, applying pedagogical criteria, as in the case of Peru. Chile, however, is the only country which has developed a comprehensive national action plan to deal with the consequences of COVID-19 in higher education. It presents various lines of action that cover aspects related to technological and pedagogical support, including financial assistance, basically with scholarship students in mind.

With the exception for the time being of Chile, countries have tended to limit themselves to three areas: a) administrative measures to safeguard the operation of the system; b) financial resources; and c) the availability of resources to give continuity to the training activities.

Administrative measures

Generally speaking, governments with the capacity to do so, have endeavored to take administrative measures to safeguard the operation of the system, for example, the modification of the matriculation or examination calendars and the facilitation of the reprogramming of either the accreditation procedures underway or quality assurance.

The effects on academic calendars are already being felt worldwide: the International Baccalaureate (IB) exams have been canceled for the first time in history; the March and May exams for the SAT, the benchmark test for access to many HEIs in the United States, administered by the US College Board, have also been canceled - it remains to be seen what will happen with the application call in June. China has canceled the SAT, TOEFL, GRE and GMAT exams taken locally. Other countries, mainly in Asia so far, which have postponed their exams for access to higher education until July are: China with almost 11 million students being affected, South Korea, Indonesia and Hong Kong.

In Latin America, the changes are equally substantial. In Ecuador, the publication of the allocation of quotas to the different HEIs has been suspended for the time being, to prevent students from going to Internet cafes to check their results. In Colombia and Paraguay, where distance higher education regulations require prior accreditation in order to operate, the decision was immediately taken to authorize the temporary change of modality during the closure of HEIs, so that the courses can now be taught remotely without the need for further administrative procedures.

In some countries such as Italy, the policy of a general pass has already been adopted, considering it a lesser evil. At the institutional level, Oxford University has also opted for the same solution.

Financial resources

In the United States, a Higher Education Emergency Assistance Fund has been created, as part of the 3 trillion-dollar stimulus package to the economy, incorporating 14.5 billion dollars (approximately half of the total contribution to education which is 30.75 billion). Despite the seemingly significant figure, the sector has responded with criticism, arguing that it will only cover the most immediate needs in the short term, and does not contemplate the medium term. The sector requested 50 billion, 90% of which will go directly to those HEIs with high percentages of scholarship students (Pell Grants) with low socioeconomic backgrounds. A 60-day moratorium has also been foreseen for the repayment of

student loan installments for those still enrolled and fulfilling the specified academic achievement requirements. For the time being, the debt has not been forgiven, although this is being demanded by many.

Australia is taking a different approach. Some 230,000 students there will receive direct aid as part of the stimulus package of 40 billion US dollars launched by the federal government. These grants will serve to at least partially compensate for the loss of direct income from part-time jobs of many students in the country.

In Norway, where part-time jobs are also very common, the government has decided to advance transfers to students with loans, but has not forgiven debts nor offered loans at no financial cost.

The German Council of Rectors has requested the creation of an Emergency Fund for students, particularly the 100,000 international students who worked part-time. Transition financial support was also requested for all students.

Chile is the only country in the region, at the moment, where financial provisions have been made to meet, first of all, the needs of students who have some type of scholarship or financial support and who, with the cancellation of face-to-face activities, could find themselves in a difficult situation since their benefits hinge on their registration and attendance at the corresponding HEI. Secondly, Chile has also redirected public funds already available for strengthening state university systems (to the tune of 30,000 million pesos) to promote the creation of a state distance education network, at the same time encouraging innovative projects by allocating complementary funds representing an additional one third (10,000 million pesos).

Meanwhile, Argentina, in line with the provisions adopted in other countries, took the decision to enforce paid leave for all HEI staff, initially for fourteen days, a measure which also has significant financial implications.

Support for teaching continuity

The fundamental guiding principle of government education policies has been to do everything possible to guarantee the continuity of teaching activity, which has resulted in different initiatives on three different fronts: platforms, teacher training and digital content.

The primary and most significant area of initiatives has been to favor the implementation of emergency technological solutions for teaching continuity. Basically, attention has focused on making available to HEIs that lack their own virtual education platforms, the technological mechanisms and resources for teaching distance courses, thereby guaranteeing minimal platform infrastructure. This has been the case for example, of Argentina, Brazil or Chile. While Chile has free access to the Google Classroom platform thanks to a commercial agreement with this company, Brazil, taking into consideration the approximately 19,000 university students at HEIs which do not have their own

platform, has chosen to expand the capacity of its *National Rede of Ensino e Pesquisa* (RNEP) to increase the offer of classes by videoconference to federal universities and institutes. In fact, this capacity has been increased by 50% and now allows simultaneous access of up to 10,000 persons to the platform, representing a total of 123,000 students.

It is important to highlight the practical absence of reference to other distance education means whose effectiveness is well proven, such as radio and television (Laaser & Toloza, 2017; Xiao, 2018). The only country where the government has recalled the importance of these means has been Mexico, for the moment, which is a country with a long tradition in this area, particularly through *Telesecundaria*. In other regions, particularly in Africa, the use of television has been kept in mind from the outset; in Morocco, for example, the popular sports channel *Arryadiaya* began broadcasting university classes on March 25.

The second crucial element to guarantee the continuity of the teaching activity is the teachers' own competences to operate in virtual environments of high technological complexity, for which they are not - nor did they have to be - necessarily prepared. In Peru, the government has suggested precise guidelines for action to public universities, based on the recommendation to start developing a situational analysis or institutional capacity. Some countries, such as Argentina through the National Institute for Teacher Training, have accompanied the measures aimed at technological support for the necessary support in the development of teaching capacities for virtual education. The University of the Republic (Uruguay) has done the same to promote the best use of the virtual training environment (EVA). Unfortunately, these initiatives have not been widely replicated in other countries. In Chile, the government has chosen to facilitate the creation of an alliance, supported by nine public and private universities, to disseminate good practices and offer, at the same time, support in teacher training to the other universities that request it through a device managed by the Ministry of Education.

Finally, the third element is the didactic contents. As discussed below, HEIs also start from very different situations in this area. Although the majority of the solutions adopted seem aimed at favoring classes by videoconference, HEIs that have their own platforms have the advantage of having an important collection of digital teaching resources whose availability and quality can be critical. Although it would seem logical that these resources, in a crisis situation, should be pooled and that governments would generate, if not incentives, at least the opportunities to do so, the truth is that only Chile and Mexico have advanced in this possibility. The latter country, in particular, has proposed that the National Open and Distance University become a national repository. For its part, the Ministry of Universities of Spain, in collaboration with UNED and the UOC, has created a platform (Connected: the home university), with resources for non-classroom learning and guides to support teachers in the migration process from face-to-face model to online mode.

B. Institutional responses

The crisis has unfurled so quickly that it is difficult to access data that gives an idea of the multiple responses of HEIs. The results of a survey of the directors and presidents of 172 US HEIs on the impacts of COVID-19¹³ conducted between March 17 and 19 show that for 9 out of 10 institutions the main immediate concern is the socio-emotional health and well - being of students and workers, teachers and non-teachers. However, only 2 out of 10 state that they have implemented specific measures in this area.

The change in modality is not without great concern on the part of university leaders, with eight out of ten convinced that retaining students to follow online courses is extremely problematic. This could translate into losing students who will no longer return to HEIs when they reopen.

Other areas of concern include student access to the requisite technologies and platforms (76%) and the institutions' own real capacity, in technological and pedagogical terms, to offer quality online education (75%). Many rectors and presidents admit that the change in modality was the result of an unforeseeable emergency situation and that they should start to plan for online teaching in the next term with greater pedagogical support and resources, anticipating that the duration of the crisis will extend beyond the term.

From the beginning, institutional responses have covered different areas: the strictly health front, the adjustment of calendars, the research and development contribution to mitigate the pandemic, the guarantee of continuity of training activities through distance education, bibliographic and technological resources support, and also socio-emotional support to the university community. The responses in each of these areas are discussed below.

The health front

Most HEIs took exemplary measures from the outset to safeguard health on campus and in buildings. These measures included information campaigns, reduced mobility and, in many cases, the progressive cancellation of events and meetings. However, the effectiveness of these measures was soon overtaken by the events that forced the suspension of all face-to-face activities practically a week after the first cases of infection were detected. However, there are some exceptions, particularly for administrative or non-academic personnel whose activities are critical to the baseline operation of HEIs and which cannot always be carried out from confinement at home.

Special mention should be made of the medical, nursing and pharmacy faculties and schools, particularly those linked to university clinics and hospitals

¹³ <https://www.insidehighered.com/booklet/responding-covid-19-crisis-survey-college-and-university-presidents>

that, from the outset, far from canceling their activities, have been placed at the service of the public health authorities in all countries. The Universidad del Valle de Colombia, which has made a questionnaire available to its students and all its staff to report their symptoms of COVID-19 to the University Health Service and to provide them with the health care required in each case. Sometimes this has been done from an innovative perspective, as has been the case with the hackathon, a meeting of programmers whose objective is the collaborative development of software, organized by the National University of Córdoba (Argentina) to collect possible responses to challenges of all kinds raised by the pandemic. Similar initiatives have also been the subject of national calls as in Bolivia.

Calendar settings

There is uncertainty about when not only face-to-face classes but also exams, assessment procedures and, of course, enrollments that are part of the cycle of any academic year, can be resumed. At the moment, it is impossible to make predictions. The HEIs that have competences in this field have been postponing the major milestones of the academic calendar in line with the provisions governing confinement and quarantine put in place by the respective governments, which in the southernmost countries is translating into the postponement of the start of the academic year. However, it seems clear that the return to normality will be very gradual. For example, Italian universities expect to open their doors in September, that is, at the start of the 2020-2021 academic year, the same as many Spanish universities.

A very important element in the application of business continuity is administrative security. Often accustomed to going to physical customer service windows, students may now find themselves at a loss from the inevitable administrative changes. To facilitate the correct attention to the students, the University of Cartagena (Colombia) created three virtual windows to attend to administrative questions, academic procedures and student welfare.

The need to maintain, as far as possible, a certain administrative normality to avoid greater evils or avoid suspending acts that are very significant in university life has also led to some worthy innovations. At the National University of Córdoba (Argentina) a virtual graduation ceremony was held at its Faculty of exact, physical and natural sciences.

Contribution of R&D

Not all HEIs have the same R&D resources. Throughout the world, many HEIs have reacted to the pandemic by integrating their research groups with government efforts in epidemiological surveillance, clinical drug testing, rapid virus detection tests, etc. Similarly, groups have been integrated to produce

biomedical equipment such as respirators and involved in other innovative actions.

In Latin America, large public and private universities with research capabilities have redoubled their efforts in the area of coronaviruses. HEIs have reacted to the pandemic by integrating research groups to support government efforts in epidemiological surveillance, clinical drug testing, rapid virus detection tests, etc. Similarly, groups have been integrated to produce biomedical equipment such as respirators and involved in other innovative actions. Where there is production capacity, some HEIs have made significant contributions to national health systems. In Argentina, as well as in Brazil, Colombia, Costa Rica, Honduras, Mexico and Uruguay, numerous national universities have begun to provide services and create products needed to face the impact of the pandemic. For example, several have started producing sanitizers, chinstraps, and respirators. Almost all of them are organizing campaigns to promote prevention measures in communities near their campuses and are collaborating with State agencies in this type of initiative and others dedicated to ensuring sanitary conditions and proper nutrition. Several have hospitals, where they do the same and have started receiving patients. Others are working on their own, and / or in collaboration with CONICET, to accelerate research in the hunt for a vaccine and palliative drugs.

Beyond crisis-related research, there are other areas that require the capabilities of higher education to produce new knowledge and develop renewed capabilities. One of them, among others, is precisely education. During the crisis, it is not possible to quantify the learning that is taking place in this area, from the pedagogical to the economic, psychosocial, etc. Certainly, in the near future it will be possible to take advantage of the knowledge generated in the learning, in some cases "forced", that this situation is generating. It can help us to develop an early warning system to anticipate and mitigate the effects of crises such as this on educational systems and student learning, teachers and the systems themselves. Undoubtedly, a great deal of research will also be generated regarding the effects of this crisis in areas such as environmental sustainability, industry, the economy and others.

Continuity of teaching

Most HEIs have chosen to continue offering regular courses using virtual platforms and always with the guarantee of credit transfer. Here, however, there is a huge difference between those HEIs that have their own capacities both technological and in teaching resources and, above all, experienced teachers and those that do not. In fact, one could speak of a continuum with two extremes as described below.

At one extreme are the universities, public or private, of greater size and international exposure that already have a remarkable tradition of virtual education, generally forged in the subsector of postgraduate and university

extension courses. In these cases, there is a platform for virtual education that is often also offered to face-to-face undergraduate students as a didactic complement where they can find programs, readings, exercises and, of course, communication mechanisms between students and also with teachers. In general, the intensive use of these platforms in traditional courses always depends on the initiative of the corresponding teacher, as previously indicated.

Some universities, such as the one in Sao Paulo (Brazil) even have different platforms to facilitate access to digital content (e-disciplines) or to use video-streaming (e-classrooms), which offers complementary alternatives to teachers and students. Other HEIs, with less technological developments, have proposed to the teaching community the use of less complex means but also as possibilities; Thus, the Universidad Mayor de San Andrés (Bolivia) has suggested that teachers use generic applications, in the absence of a virtual campus, such as email, video calls and WhatsApp.

But even in the case of HEIs accustomed to an intensive use of technology in teaching, some have seen the need to prepare teachers and students for the transition to virtual education, with all that this entails in terms of technology and skills for digital teaching and learning. This has been the case of the University of Los Andes (Colombia) which, during the week prior to the closing of face-to-face activities, offered different training programs for the virtuality of teaching for both teachers and students. Another strategy has been to reinforce the already existing virtual education offices of HEIs, precisely to guarantee better support for teachers and students, as has been the case of the National University of San Marcos (Peru). An indication of the magnitude of the efforts required is given by some figures from the National Technological University (Argentina): twenty days have been required to create a thousand virtual classrooms, but also the university, with a student population of approximately 13,500 students, accredits attending some 4,500 daily technical and support queries.

At the other end of the continuum of capabilities to operate remotely are small, privately owned universities, which have few resources to cope not only with the change in the modality of teaching but, furthermore, with survival itself in a context that forces them to reorganize themselves financially.

Between these two extremes, it is possible to find a great variability of situations that depend, fundamentally, on two variables: the institutional capacities in the field of virtual education, forged with previous experience, and the regulatory framework. Where this regulatory framework has favored innovation and experimentation in virtual education, the situation is quite different from where governments, for different reasons, have slowed the growth of distance higher education, as is the case of Bolivia and Peru, which, in a situation such as that created by the current crisis, has deprived HEIs of the immediate response capacity that has occurred elsewhere. In Peru, the existing gap has been attempted to be solved with precise guidelines for HEIs to analyze their own capacity for virtualization, make the appropriate decisions on a course-by-

course basis, and equip themselves with internal mechanisms for teacher training and continuous quality assurance in provision of the remote modality.

The HEIs in the region deserve a special mention, as they respond to a model similar to that of open universities, such as the National Open and Distance University of Colombia, the State Distance University of Costa Rica and the rest of the members of the Iberoamerican Association for Higher Distance Education (AIESAD). Although many of them also teach face-to-face courses, they have extensive experience in distance teaching, so that their teachers have the necessary qualifications and, above all, their degrees are specifically designed to be taught in this mode and, therefore, the methodology and content are fully adapted to it. The effort that universities are making to migrate their teaching to the virtual environment does not exactly correspond to distance education as it is conceived and taught by this type of university, which, however, is showing an extraordinary predisposition to share their experience with the rest of the HEIs in the region and to support them in the virtualization process of their teaching.

Similarly, large providers of massive open online courses (MOOCS) such as Coursera and EdX have also offered their support to HEIs that may see a suitable complement in their offer. It must be remembered, on the other hand, that in most cases the courses offered under this model are completely free if a certification is not requested.

The paradox is that even in countries where a regulatory framework favorable to virtual higher education already existed and where HEIs have managed to generate their own capacities in this regard and, therefore, with greater ease to transfer them to face-to-face programs that can now only have continuity in virtual mode, not all disciplines or programs admit the required technological and didactic transfer with equal ease. The most worrying case is that of the subsector of technical and professional higher education, which often depends on instruments and laboratories to train its students.

Support in bibliographic and technological resources

Many HEIs realized, from the outset, that migrating to a virtual mode involved very significant risks of widening the effects of the digital divide by leaving unattended those students in whose homes there was no access to the quality of equipment or bibliographic resources or connectivity necessary to take advantage of the distance education offer supported by high technological components.

In Latin America, HEI libraries and resource centers closed when face-to-face activities were suspended and there is no record of the continuity of these services. On the contrary, in Norway and Sweden, for example, in anticipation of closures or even when they were being decreed, some libraries established temporary closure plans in respect of manuals considered critical for students requiring them, setting strict limited time for each individual.

What more frequently obtains, not necessarily in the majority of cases, are initiatives taken by some HEIs to support students who lack equipment, by making available laptops or tablets on a temporary basis. Also, there has been an increase in the queues of students and teachers seeking technological support, particularly regarding the use of virtual platforms. In Peru, for example, the government has reminded HEIs of the importance of providing alternative assistance for those students who do not have the necessary tools to access the virtual offer.

Socio-emotional support

The isolation that confinement entails has also been quickly identified by some HEIs and psychological and socio-emotional support mechanisms have been put in place, particularly for students. This is not a common measure, but when it has been taken it has usually capitalized on the resources of the psychology faculties or student welfare services. For example, the Franz Tamayo University (Bolivia) has made 13 psychologists available to the university community, precisely to support them in situations of isolation.

Similarly, the Center for Human Development and Counseling (CADH) of the Universidad Católica Andrés Bello (Venezuela) launched a “Psychological Support Group in Times of Pandemic” that, with the help of therapists and via videoconference, offers to break the dynamics of confinement and to reflect on their own experiences and those of others to help them better cope with anguish and anxiety. Also, as already indicated, the University of Cartagena (Colombia) created a virtual window specifically for attention to student welfare issues.

3. Preparing for tomorrow

We must remember that, as the Chinese proverb says, spring always ends winter. While the calendar for the reopening of HEIs may be uncertain or indefinite, now is the best time to plan our way out of the crisis. To this end, here are some basic principles that from a UNESCO perspective, should guide national and institutional policies; also, some recommendations inspired by these principles that attempt to shed light on some of the more controversial issues.

A. Basic principles

Although the contexts of the countries are very different, it is important to establish a reference framework that helps decision-making processes in the higher education sector, 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 HEIs 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 HEIs 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.*

B. 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). It is clear, however, that there are a number of controversial areas in which different alternatives are offered and which are discussed 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.

1. Include higher education in stimulus plans for economic and social recovery

The Economic Commission for Latin America and the Caribbean (ECLAC) forecast an economic growth of 1.3% for 2020, a forecast that as of March 18, 2020 reverts to a -1.8% contraction in regional domestic product¹⁴. The slowdown in the Chinese economy alone would mean a decline in the value of exports to 10.7% for its main trading partners in the Region - Brazil, Chile and Peru. 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

¹⁴ <https://www.cepal.org/es/comunicados/covid-19-tendra-graves-efectos-la-economia-mundial-impactara-paises-america-latina>

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 HEIs, 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.

2. 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 non-academic 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 also the learning of lessons obtained, as well as the 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 HEIs 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.

3. 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 HEIs 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:

- a. 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 England, 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.
- b. Co - curricular activities, which Rectors of Spanish HEIs 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;
- c. 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.

4. Commit to international cooperation

In the face of a crisis that knows no borders, international cooperation from the perspective of multilateralism is more crucial than ever. This cooperation is important in the higher education sector not only because of its impact on international mobility, but because, above all, it is the only possible way to learn more quickly what has worked in the context of the crisis, why and under what circumstances; also to forge alliances that, in the face of future crises, will allow for action in a coordinated and more efficient manner.

Specifically, international cooperation must be oriented to:

- Encourage peer-to-peer learning on policies;
- Build alliances that promote the resilience of higher education systems;
- Share resources and technological solutions; and
- Give better international legal coverage to academic mobility.

Institutional strategies

At the institutional level, attention must inevitably focus first on how to manage the processes, particularly teaching continuity, during and immediately after the crisis, and second, to take advantage of the lessons learned to reflect on the teaching processes and learning in higher education.

1. Anticipate an extended suspension, focusing efforts on ensuring training continuity and guaranteeing equity, creating governance mechanisms, monitoring, and efficient support

In the weeks following the suspension of face-to-face activities, it may seem that you just have to be in a waiting mode, until classes can resume. Using the events in China in China and in other Asian countries as a point of reference, everything seems to suggest that the return to face-to-face classes will take longer than originally anticipated, possibly between two and four months. The fact that face-to-face classes are essentially group activities will mean that, in the context of social distancing measures, a recurrence will be expected.

The enormous efforts to adapt to new training modalities by both teachers and students also require that HEIs monitor how teaching activities are carried out and what are the needs, of any kind, that can emerge in the academic community. It is therefore useful to:

- Establish a crisis committee to focus essentially on continuity and equity, incorporating technical and pedagogical elements, and be the voice of the main actors;
- Monitor and provide daily follow-up on the needs that arise in each case;

- Address priority issues to address the lack of equipment or connectivity, and as far as possible, offer services and applications for cell phones; and
- Guarantee that students and teachers have permanent support lines, by telephone or internet.

2. Design pedagogical measures to formatively evaluate and generate mechanisms to support learning among disadvantaged students.

How to validate distance learning? The natural recommendation is that diagnostic evaluation tests be carried out for each course to locate the level of competence of each student relative to what would be reasonably expected. It is very important that these tests are formative in the sense that they guide the teaching responses and that they allow to adequately differentiate the levels of achievement of students. There are various instruments for distance education assessment that can be effective, although an issue which is not yet fully resolved, is the verification of the student's identity. Again, technology can be used as a support tool for personalizing the validation process.

In this sense, there are some strategies that, despite not being frequently used in higher education, can bear good fruit, such as:

- Individualized tutoring;
- Small learning groups to facilitate equal progress in critical subjects which are fundamentally important and
- Summer (or winter) schools offering compensatory seminars.

Inevitably, the implementation of initiatives such as these carries an associated cost which is not negligible, but the benefits in terms of quality of learning and equity, far outweigh the costs.

3. Document the pedagogical changes introduced and their impacts

HEIs should, in an exercise in transparency, document from the outset the measures and changes made to promote distance learning to students. In this sense, guidelines and recommendations such as those distributed by the United States Department of Education or the Ministry of Education of Peru can be very useful. This documentation will probably be required at some point by the quality assurance agencies to certify the processes.

4. 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 HEI, 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, & Gröhbiel, 2016). 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 socio-emotional 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 Rwanda, 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 HEIs. There are many lessons to be learned from the international 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.

5. Promote internal reflection on the renewal of the teaching and learning model

Finally, HEIs 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 HEIs have 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 HEIs will undertake the path of a necessary pedagogical renewal that favors both quality and equality.

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