# DIGITAL DIVIDE IN PERUVIAN HIGHER EDUCATION: A POST-PANDEMIC REVIEW

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## ABSTRACT

By early 2020, the COVID-19 pandemic paralyzed the world, with the origin being the Chinese city of Wuhan. By March 11, 2020, the World Health Organization (WHO) declared COVID-19 a pandemic. The dire consequences of this disease were reflected in a historic global recession, and in the health field, SARS-CoV-2 had wreaked havoc, especially in the elderly, due to worse manifestations and higher mortality rates. As a result, most countries were able to curb the spread of the virus by imposing mandatory measures such as not leaving their homes and very strict timetables. Among the measures considered was the closure of educational institutions, including universities. At that time, there was a paradigm shift in the way educators had to change the way they taught classes by making use of various online platforms. Online, distance and continuing education learning became a panacea for this unprecedented global pandemic for both educators and students. In this review, a passage is made through the different scenarios experienced by the COVID-19 pandemic, taking into account several objectives such as: the COVID-19, and the case of universities, the educational transition: from face-to-face to virtuality, challenges and opportunities after the pandemic, and last but not least, how the Peruvian State, was able to cope with the pandemic of Covid-19, and the challenges that should continue to be considered after the pandemic.

**Keywords:** Digital divide; Post pandemic; COVID-19; higher education; Peru.

# EXCLUSÃO DIGITAL NO ENSINO SUPERIOR PERUANO: UMA ANÁLISE PÓS-PANDÊMICA

## RESUMO

No início de 2020, a pandemia de COVID-19 paralisou o mundo, tendo como origem a cidade chinesa de Wuhan. Em 11 de março de 2020, a Organização Mundial da Saúde (OMS) declarou a COVID-19 uma pandemia.  As terríveis consequências dessa doença se refletiram em uma recessão global histórica e, no campo da saúde, o SARS-CoV-2 causou estragos, especialmente nos idosos, devido às piores manifestações e às maiores taxas de mortalidade. Como resultado, a maioria dos países conseguiu conter a disseminação do vírus impondo medidas obrigatórias, como não sair de casa e horários muito rígidos. Entre as medidas consideradas estava o fechamento de instituições de ensino, inclusive universidades. Naquela época, houve uma mudança de paradigma na forma como os educadores tiveram que mudar a maneira como ministravam as aulas, fazendo uso de várias plataformas on-line. O ensino on-line, à distância e de educação continuada tornou-se uma panaceia para essa pandemia global sem precedentes, tanto para educadores quanto para alunos. Nesta revisão, é feita uma passagem pelos diferentes cenários vivenciados pela pandemia da COVID-19, levando em conta vários objetivos, tais como: a COVID-19 e o caso das universidades, a transição educacional: da presencialidade para a virtualidade, desafios e oportunidades após a pandemia e, por último, mas não menos importante, como o Estado peruano conseguiu lidar com a pandemia da COVID-19 e os desafios que devem continuar a ser considerados após a pandemia.

**Palavras-chave:** Divisão digital; pós-pandemia; COVID-19; ensino superior; Peru.

## 1 INTRODUCTION

With the emergence of COVID-19, the world faced, and continues to face, one of the most catastrophic pandemics of the 21st century, and it is still a challenge. The virus has also had devastating social, educational, health and economic effects. The pandemic spread globally in early 2020, beginning in Wuhan China and then spreading to all countries of the world.

The authorities of educational institutions had to take containment measures to avoid cases of contagion, suspending the development of face-to-face classes at all educational levels, to move to the virtual modality. According to reports provided by UNESCO, at that time, 166 countries had closed their schools and universities, affecting a student population of more than 87%, and millions of teachers were also affected (IESALC-UNESCO, 2020).

The spread of the COVID-19 pandemic caused social distancing between students and teachers, forcing higher education institutions to close their doors. Faced with this situation, alternative resources such as digital platforms and tools emerged to give continuity to the development of education (Manrique Maldonado et al., 2021). For this reason, online education became the only option, however, it generated concern among students and teachers regarding the proper development of the learning process with this teaching methodology. Because the pandemic was not expected and few institutions were prepared, mainly in less developed countries. Also, online education had a notorious impact on teachers, for some it was a challenge and for those with less technological knowledge, it was a difficult situation to assimilate (De Vincenzi, 2020).

The transition to online education required a management system that would allow effective learning, installing video-conferencing systems and teaching experience in distance education (García-García, 2020). Likewise, the WHO (2020a) made proposals to higher education institutions, suggesting that the new teaching modality should consider various strategies that adapt to the psychosocial reality of students, ensure the inclusion and selection of technologies that guarantee the protection of information (Fernández-Batanero et al., 2021).

In this review, a passage is made through the different scenarios experienced during the COVID-19 pandemic, taking into account several objectives such as: COVID-19, and the case of universities, the educational transition: from face-to-face to virtuality, challenges and opportunities after the pandemic, and last but not least, how the

Peruvian State faced the COVID-19 pandemic, and the challenges that are presented today.

## 1.1 In Context with the COVID-19 Pandemic and Higher Education

Furthermore, the COVID-19 pandemic affected the health of all age groups, primarily older adults and patients with comorbidity, who had higher mortality rates (Goldman, 2020). In addition to carrying forward many problems and challenges that already existed in the health area, the COVID-19 pandemic had created unforeseen complications in society and the economy (Cao et al., 2020) as in the case of other pandemics throughout history. A few months after the onset of the COVID-19 pandemic, it had become clear that the impact of the consequences produced at all levels would affect people's lives for many years to come (Eurofound, 2020, Liu et al., 2020).

Although young people were one of the age groups at least at risk from the COVID-19 virus, students experienced drastic changes in the development of their activities during the first wave of the pandemic, generating changes in their daily lives and uncertainty about the future for their immediate and distant future. Thus, most of the countries affected by COVID.19 managed to reduce the spread of the coronavirus with varying degrees of success, using drastic measures such as the prohibition of public events and meetings, the closure of workplaces and educational institutions, and restrictions on staying at home ( Owusu et al, 2020 , OWD, 2020). The suspension of face-to-face classes in schools and universities proved to be an efficient way to minimize the spread of the virus, however, it generated many challenges to continue with new teaching alternatives (Owusu et al, 2020, Aslam, 2020) both for students and teachers, parents and employers, and therefore for society and the global economy. In addition, after the decline in cases, many students returned to face-to-face classes in educational institutions, however, there was no return to the previous situation before the COVID-19 pandemic. Many of the regulations were reformulated in detail in the post-pandemic context (Honorato et al, 2020) and would likely result in drastic changes that will last into the future (Rose, 2020).

Due to the closure of educational institutions at all levels of education, as of April 2020, 1.598 billion students from 194 countries had to stay at home (UNESCO, 2020). At the higher level during the pandemic students had to experience radical changes,

where teaching became online, changes were generated in communication, access to virtual libraries and new assessment alternatives were developed (Cao et al., 2020, Abelskamp & Santamarinam, 2020, Owusu et al., 2020) and in the social aspect, meetings with friends and family were prohibited, those living in university residences returned to their homes and many of those who were abroad could not return to their families (Cao et al. 2020, Khan, 2020), it also affected the personal financial situation, generating job losses, concern about the financial situation, where many students stopped studying ( Books et al., 2020 , Statista3, 2020) and finally in the emotional aspect they experienced anxiety, frustrations, fear, boredom and other negative emotions (Cao et al, 2020, Books et al., 2020, Ma et al., 2020). Also, there were new challenges to cope with the pandemic, such as positive changes in habits and ways of thinking, improving personal hygiene, alternatives to improve health such as quitting smoking, eating locally sourced organic food, and being more mindful of family members, especially those who were most vulnerable (Aristovnik et al., 2020).

The Peruvian state implemented a set of actions to continue providing quality education in the face of the pandemic declaration, and to anticipate the possible impact on the household economy, and with it access to higher education. The measures focused on a fair budget in order to access the internet network and the acquisition of computer and electronic devices (e.g. external modems, USB ports, tablets and solar chargers) for both teachers and students. In addition, scholarships were allocated for the less privileged. Another measure taken by the Peruvian government to respond to the development of virtual classes was their recognition by the University Law. In this sense, the respective orientation was provided to adapt the academic planning to the non face-to-face modality and measures were stipulated in order to reduce desertion and connection to the Internet. As a result of this multiplicity of measures, by December 2020, all public universities had already started classes (Mori, 2020, Rojas, 2021).

## 1.2 Educational Transition: from face-to-face to virtuality

Due to the confinement and social distancing measures generated by the COVID-19 pandemic, institutes and universities of higher education closed in most countries . This generated a change in the teaching paradigm for teachers, who had to use various online platforms. Thus, online, distance learning and continuing education became a panacea for continuing education during this unprecedented pandemic for both students and teachers. The transition from face-to-face training to online methodology

led students and teachers to adapt to the new circumstances since in many cases it was the only alternative they had, due to the emergency caused by the COVID-19 pandemic, through online platforms they found themselves in the need to adapt to a system for which they were not prepared. Thus, e-learning tools played a crucial role during the pandemic, as they helped facilitate student learning (Subedi et al., 2020). In the face of these changes, students with a fixed mindset found it difficult to adapt, while students with a positive mindset and ideas of personal growth quickly adapted to the new context ( ). It also became evident that there is no single pedagogy for online learning; there is a variety of alternatives, which will depend on the groups and ages that require learning (Doucet et al., 2020).

Online learning also generated a challenge in the organization of the physical space of students, who had to get used to participate in the virtual environment, and have limited movement during the development of classes (Basilaia & Kvavadze, 2020). Due to the fact that educational institutions were closed as a measure to prevent the spread of the pandemic, where students, educators and parents experienced a sudden and unexpected change. While government authorities and frontline personnel did everything possible to stop the increase in infections, educational systems generated alternatives to continue providing quality education in difficult times. Many students suffered emotional changes, presenting difficulties to participate adequately, as well as there were no known methodologies suitable for them to study from home (Petrie, 2020), and the use of appropriate and relevant pedagogy for online education depended on the experience and exposure to information and communication technologies (ICT) by students and teachers . Some of the online platforms that had been used so far included unified communications and collaboration platforms such as Google Classroom, Microsoft Teams, Blackboard and Canvas that contributed to teachers providing interactive classes and generating the development of appropriate communication skills with students (Petrie, 2020), these platforms included chat options, video calls and file storage capable of keeping classes organized and easy to develop. It also strengthened the exchange of documents or content in Word, PDF, Excel, audios, videos and many more. These options allowed the teacher to track student learning through the use of questionnaires and evaluations based on electronic rubrics of the activities sent. The flipped classroom was a friendly and simple strategy where the teacher provided learning resources such as articles, pre-recorded videos and YouTube links prior to the development of the class, so students entered with knowledge of the topics to be covered in each class and the time of the online session

was used to deepen understanding through the exchange of ideas between students and teachers (Doucet et al., 2020. In this way, skills such as problem solving, critical thinking and self-directed learning were effectively developed in students through virtual classroom platforms such as videoconferencing (Zoom, Meet, WebEx, Slack and Cisco) and learning management platforms such as Moodle, Elias, BigBlueButton and Skype were also frequently used (Pokhrel & Chhetri, 2021).

In Peru, it was possible to conclude that despite all the problems that arose during virtuality, various learning opportunities were also generated in the university community. Students strengthened their personal development, such as being more self-disciplined, with better time management, greater responsibility, resilience, autonomy and flexibility; while teachers were able to develop various skills and digital tools that can later become valuable learning. Despite the positive aspects, it is important to highlight the wear and tear generated by distance education without prior planning (Vilela et al., 2021).

## 1.3 Challenges and Opportunities after the Pandemic COVID-19

The COVID-19 pandemic has generated many challenges and advances at the educational level, with the implementation of smart technologies that ensured the continuity of education. This digital transformation of education leads to long-term benefits that go beyond the development of distance education. The new global scenario also allowed to reflect on the future of online education, where the only option is not the classroom, but new options such as online education, open educational resources and other technologies that will contribute to improve academic productivity. It could also accelerate the pace of learning, reduce the costs of materials needed in face-to-face classes and optimally organize teachers' time (U.S. Department of Education, 2020). The above are benefits that institutions have with online education, however, it is still a challenge to strengthen teaching (Jeong & Gonzalez, 2021). Studies on online education were reported, such as the one presented by Fernández et al., (2022), who refer that online education is a good alternative for the development of higher education, however, several weaknesses were found (Flores-Cueto et al., 2020). While it is true that many institutions expressed their preference for face-to-face education, others will continue with online training sessions, so they should invest in quality platforms and strengthen teacher training strategies (Ho et al., 2021). The experiences of students and teachers during the pandemic cannot be compared with

the online education that will be presented in the future because the pandemic was an unexpected situation and was not adequately planned, so online education can be just as successful and efficient at the higher level (Ashri et al., 2020).

The implementation of online education provides innovative and equally effective learning experiences as traditional learning without having to move to another location (Elfirdoussi et al., 2020). On the other hand, it is essential to take into account transnational education, where students may find themselves in a country other than their home institution of higher education. One of the countries favored with this teaching alternative was China, which has demonstrated its resilience to the pandemic, a country that has expanded in transnational education after the pandemic. Su et al., (2022), refer that one of the most effective methods to use in this teaching modality is the inverted classroom approach, since it allows students to become familiar with the didactic materials. In addition, a high degree of engagement and interaction can be achieved, moving teachers away from traditional lectures, with didactic readings and inspiring them to provide quality teaching in a transnational context.

Thus, in the context of the suspension of face-to-face classes in Peru, this meant a series of challenges and opportunities for teachers and students under this emergency remote education system. Most of the challenges focused on the limited access to the Internet, the adaptation of methodologies and educational resources that had to be developed in a very short time for adequate planning, together with the lack of knowledge for the use of the different virtual platforms (Quinteiro et al., 2020).

## 1.4 Peru: Universities and COVID-19

In Peru, at the end of March 2020, after the declaration of a national health emergency due to the COVID-19 pandemic, the Ministry of Education made official a set of norms and guidelines regarding the development of higher education. In this context, the education sector, together with the Peruvian Congress, deployed a series of modifications to the University Law in order to provide answers and quality criteria for the new virtual education. Before the pandemic, the University Law had already determined the need to offer distance education with the same level of quality as face-to-face education, but without exceeding 50% of the total number of face-to-face credits. During the pandemic, the Ministry of Education developed criteria to guarantee the quality of university education by making use of Information and Communication Technologies (ICT) and their connectivity with students; generating training for

teachers to adapt to the new alternatives to be considered in online teaching. This was possible, since Peruvian universities had official licenses for virtual platforms for the development of distance education in virtual environments (Congress of Peru, 2014). However, in the face of the emergency, Peruvian higher level institutions had to look for alternatives to adapt to the new regulations established, to move from the face-to-face modality to the online teaching modality, in order to use the virtual resources that many universities in the world had implemented (Crawford et al., 2020) . In this regard, Mendoza et al., (2020), reported that in this scenario of health emergency due to the COVID-19 pandemic, Peruvian university teachers had limited knowledge and skills to use ICT as a teaching tool, in line with the reality of many countries, although some others adapted quickly to virtual education (Crawford et al., 2020). This group of teachers were mostly found to be between 51 to 60 years of age. They were also accustomed to face-to-face and had little content knowledge appropriate for dealing with virtuality (Gros et al., 2020, Dabbagh et al., 2007). However, most students quickly adapted to the use of the various platforms (Suarez et al., 2012). Likewise, younger teachers (under 35 years of age) also adapted more easily to the use of ICT resources for online teaching (Lin et al., 2017). Another factor that influenced teachers' and students' ICT learning was the initiative and motivation they presented. Students learned more about ICT by their own means, i.e. through self-training (WHO, 2020b). This situation confirmed the weakness of students and teachers in the use of ICT at higher education levels during the COVID-19 pandemic .

## 2. CONCLUSIONS

At the beginning of 2020, it became known worldwide about COVID-19, which was caused by the SARS-CoV-2 virus in China. Thus, on March 11, 2020, the World Health Organization (WHO) declared COVID-19 a pandemic. There were dire consequences in all countries of the world, where one of the most affected areas was Health, SARS-CoV-2 had affected all age groups, being the most vulnerable people the elderly due to the high mortality rate they had. Most of the countries affected by the pandemic were able to curb the spread of the coronavirus with varying degrees of success, even considering as drastic measures to mitigate the virus the prohibition of public events and meetings, the closure of workplaces, restrictions to stay longer at home, in the national and international transportation system, testing and contact tracing and the suspension of face-to-face classes. The closure of educational institutions proved to be an efficient way to minimize the spread of the virus, however, it generated many challenges, as changes had to be generated in the teaching methodology, moving from face-

to-face classes to online classes. Online, distance and continuing education learning became the only alternative for students and teachers to face this unprecedented global pandemic. The transition from traditional face-to-face learning to online learning may have been a completely different experience for learners and educators, who had to adapt with little or no other alternatives available. Many students had difficulty adapting to online classes from home, even suffering psychological problems, which affected their productivity. There was a lack of knowledge about best practices for home-based online education, and the use of appropriate and relevant pedagogy for online education, which depended on experience and exposure to information and communication technologies (ICT) for both students and teachers. The flipped classroom was an excellent strategy in which learning resources such as articles, online books, pre-recorded videos and YouTube links were provided prior to class, the time allotted for the online class was used to deepen the understanding of the materials provided through discussion and feedback between students and teachers. Likewise, at the end of March 2020, the Peruvian State, through the Peruvian Ministry of Education, declared a set of rules and guidelines on how higher education would be carried out, in order to provide answers and quality criteria for the new virtual distance education. However, in the face of the emergency, Peruvian institutions had to accelerate these measures, to move from face-to-face to online teaching, using virtual resources like many universities in the world. Likewise, studies reported that older teachers had more complications in adapting to the use of technologies. In the case of students, the adaptation was much faster, but with some complications since learning was mostly self-learned. This situation confirmed the weakness in the use of ICTs at higher education levels during the health emergency period.

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