



Received: 2023-04-14

Reviewed: 2023-06-26

Accepted: 2023-07-03

Authors' addresses:

¹ Centro de Excelencia en Enseñanza y Aprendizaje (CE2A). Universidad de Ingeniería y Tecnología – UTEC. Jr. Medrano Silva 165, Barranco, Lima (Perú).

^{2,3} Departamento de Didáctica, Organización Escolar y Didácticas Especiales. Facultad de Educación. Universidad Nacional de Educación a Distancia. Calle de Juan del Rosal, 14, 28040 Madrid (España).


⁴ Departamento de Pedagogía. Facultad de Educación, Psicología y Ciencias del Deporte. Universidad de Huelva. Campus de «El Carmen» Avda. Tres de Marzo s/n - 21007 Huelva (España).

E-mail / ORCID


bego.mora@dedu.uhu.es

 <https://orcid.org/0000-0002-3559-4318>


slavandera@utec.edu.pe

 <https://orcid.org/0000-0003-4213-4472>

lperezsanchez@edu.uned.es

 <https://orcid.org/0000-0002-9767-4639>

amartin@edu.uned.es

 <https://orcid.org/0000-0001-7579-3701>

ARTICLE

Limits and possibilities in the techno-pedagogical virtualization process of Peruvian universities

Límites y posibilidades en el proceso de virtualización tecno-pedagógica de universidades peruanas

Silvia Lavandera-Ponce¹, Lourdes Pérez-Sánchez², Ana María Martín-Cuadrado³ and Begoña Mora-Jauregualde⁴

Abstract: The UTEC-UNED-TECSUP University Consortium took part in the eighth edition of the Support programme for the design and implementation of strategies for continuity of the Higher Education service in public universities of the Peruvian Ministry of Education (PMESUT), devised to promote the continuity of non-classroom-based educational service in public universities. This article presents the assessment carried out in four universities, with the aim of ensuring the ongoing digitization of education in the aftermath of the pandemic. Once the diagnosis had been made, the techno-pedagogical virtualization of 138 model courses was carried out in three phases: planning; curriculum design and teaching support; and implementation of the courses in the virtual classroom. Limitations were related to existing digital divides: time constraints, personal self-regulation and limited training in pedagogical and digital competences of teachers. Individualised support and tutoring measures were sought, increasing the number of synchronous sessions to facilitate assessment. The feedback focused on information, interaction and accountability on what has been done and the improvement of the didactic act in virtual mode. In conclusion, the complexity of the process was notable, as well as the high level of demand to achieve results which, although positive, encountered several obstacles arising from the different agents and elements involved.

Keywords: Higher education, Distance education, Technological education, Tutoring, Latin America.

Resumen: El Consorcio universitario UTEC-UNED-TECSUP participó en la octava convocatoria del Programa de apoyo al diseño e implementación de estrategias para la continuidad del servicio educativo superior de las universidades públicas del Ministerio de educación peruano (PMESUT), cuyo objetivo era fomentar la continuidad del servicio educativo no presencial de las universidades públicas. Este artículo presenta el asesoramiento a cuatro universidades con el objetivo de garantizar la digitalización de la enseñanza tras la pandemia. Realizado el diagnóstico, se llevó a cabo la virtualización tecno-pedagógica de 138 cursos modelo en tres fases: planificación; diseño curricular y acompañamiento docente; e implementación de los cursos en el aula virtual. Las limitaciones se relacionaron con las brechas digitales existentes: escasez de tiempo, autorregulación personal y escasa formación en competencias pedagógicas y digitales de los docentes. Se buscaron medidas de apoyo y tutorización individualizadas, aumentando el número de sesiones sincrónicas que facilitarían la evaluación. El feedback persiguió la información, interacción y responsabilidad sobre lo realizado y la mejora del acto didáctico en modalidad virtual. Como conclusión se destaca la complejidad del proceso y el alto nivel de exigencia para la obtención de resultados que, siendo positivos atravesaron varios obstáculos provenientes de los diferentes agentes y elementos implicados.

Palabras clave: Educación superior, Educación a distancia, Educación tecnológica, Tutoría, América Latina

1. Introduction

This article reflects upon the Advisory programme for the design and implementation of strategies for continuity of the higher education service of public universities, developed in 2020-2021 in Peru to ensure the functioning, quality and relevance of the Peruvian education service with regard to non-presential adaptation within the framework of the health emergency resulting from the spread of COVID-19. This initiative was part of the 8th call for proposals of the Programme for improvement of the quality and relevance of university and technological higher education services (PMESUT). In this context, the UTEC-UNED-TECSUP Consortium carried out a 157-day assessment in 4 national universities, which is the focus of this article.

The assessment was organised in three stages: situation analysis and planning of the advisory intervention; design and development of training for the education community; evaluation, monitoring and ongoing improvement. The works by Pérez-Sánchez et al. (2022) and Martín-Cuadrado et al. (2021) both present relevant results on the assessment carried out in all three phases. On this occasion, the focus is on the final stage, namely the phase of techno-pedagogical virtualization of courses on the universities' virtual platform. Mora-Jaureguialde et al. (2022) covered unique aspects of this phase, related to the key moments: planning, curricular design, pedagogical support and finally rollout of the courses on the virtual platform.

The techno-pedagogical virtualization of courses (in Latin American contexts, the equivalent of subjects) model (model course is the concept used in the assessment to designate the subjects selected for virtualization, which served as a pilot for the rest) involved the entire university community in terms of the management and organisation of human teams and technical and technological resources. A virtual learning space was designed to map out personalised routes to respond to digital needs from their areas of residence. All this under an overall perception of virtual education as "the only way to avoid interrupting students' education in the face of the lockdowns that prevented them attending educational institutions" (Cabrera et al., 2022, p.323).

Educators from the UTEC-UNED-TECSUP Consortium assumed the role of tutors: on the one hand, by orienting and guiding teachers through their tasks; and, on the other hand, by motivating on the progress achieved, encouraging from a planned and systematic perspective. The limitations found were linked to the scarce and/or inadequate teacher training in pedagogical, methodological and technological competences, which entailed a slow pace in the progress of virtualization. One-to-one synchronous sessions were increased to strengthen techno-pedagogical concepts that led to a better understanding of e-learning. At the same time, the training scheme remained open, providing propaedeutic support in situations as required. Finally, other annexed training sessions were designed, according to the needs that arose (Pérez-Sánchez et al. 2022).

The aim of the article is to reflect on the learning achieved and the limitations encountered by the teachers involved in the creation and implementation of their model courses in virtual mode, in response to the distance teaching-learning model commissioned by the Peruvian Ministry of Education. What were the main constraints in the virtualization process of model courses in intercultural universities in Peru?

1.1. Techno-pedagogical accompaniment

Morado (2017) approaches techno-pedagogical accompaniment (TPA) from the standpoint of training, guidance and mentoring, "carried out with the teaching staff through workshops, where teachers developed the virtual environments of their courses" (p.3).

Likewise, she states that this accompaniment, "as well as the progressive and guided construction of learning environments with the use of technology, is effective and satisfactory for those involved and the knowledge lasts over time, regardless of the presence of the facilitator" (p.1).

From this perspective, the different initiatives found in the field of higher education before and during the pandemic have a relevant point in common: Teacher Guidance (Coicaud et al.; 2021; Digión and Álvarez, 2020; United Nations Children's Fund, 2021; Mora-Jauregui et al., 2022; Morado, 2017). Morado (2019) presents the transformation experienced by the teachers who participated in her research through a TPA process that enabled them to learn how to effectively transition to virtual learning environments. Moreover, the ECLAC-UNESCO COVID-19 report indicates that, in those environments that allow it, teacher support and training are key to the use of new technologies in education (p.11).

2. Method

The virtualization plan carried out in the four universities involved in the assessment project had the aim of creating, designing and transforming the subjects, hitherto face-to-face, into virtual courses within the Moodle platform, in order to implement teaching in distance mode, necessary after the outbreak of COVID-19. The selection of the participating courses consisted of combining general requirements set by the Peruvian Ministry of Education; those of each of the institutions on the basis of specific approaches in line with their contexts and criteria; and, finally, taking into account the Consortium's proposals.

In terms of the process structure, a complex organisation including all the university actors involved was put in place. To this end, guideline documents (standardised templates) for the end-to-end process were designed. The components and elements involved are described below: actors, selection mechanisms, working documents and defined phases.

2.1. Sample

The universities involved are National University of Quillabamba (UNIQ), the National Intercultural University of the Amazon (UNIA), National Intercultural University 'Fabiola Salazar Leguía' of Bagua (UNIFSL-B) and the National Intercultural University of the Central Jungle 'Juan Santos Atahualpa' (UNISCJSA). Initially, the Peruvian Ministry of Education proposed the virtualization of 35 courses per university, with the exception of the UNIA, which aims to achieve 50 virtualised courses. Each course would be the responsibility of a different teacher, a priori. With this premise, 155 courses were determined to be virtualized by the same number of teachers.

2.2. Criteria for selecting the courses to be virtualized

MINEDU sets the criteria for maintaining the educational service in Peru according to the type of subjects, designated face-to-face, mixed or blended and virtualized. Each university selects the subjects that made up its curricula, depending on the degree of virtuality admissible, proposed for virtualization, adapted or rescheduled. The common criteria applied for the selection were: a) the nature of the contents; b) the number of hours and/or credits; c) the necessary means (infrastructure); and d) the resources for development (pedagogical, technological and support)." (MINEDU and UNESCO-IESALC, 2021, p.9).

2.3. Consortium criteria for assessment of the courses selected

To determine whether the courses, considered a priori, were suitable for transfer to virtuality, an evaluation rubric was drawn up based on 17 objective criteria: syllabus curricular elements; modular structure; welcome; course guide; textual materials; visual materials; audio-visual materials; activities; interaction; collaborative tools; assessment; instruments; academic integrity; synchronous monitoring; asynchronous monitoring; learning sequence planning and virtual classroom. Each in turn was divided into 4 levels of execution, ranging from Excellent to Unacceptable. The resulting items (crossover between criterion and performance level) are scored from 0 to 3.

In this way, adding the score assigned to each criterion, an overall value is obtained for the course analysed. Based on the overall value, the subjects are finally identified as not at all virtualizable, 0% virtualizable (1-20 points), partially virtualizable, 25% (21-30 points), moderately virtualizable, 50% (31-40 points) and 100%, fully virtualizable (41-51 points). Finally, MINEDU proposed that each university should virtualize 35 courses (one course per teacher); however, UNIA increased this figure to 50 courses. UNICSJSA upheld the ministry's proposal. UNIA and UNIFSL-B, with the 35 courses, reduced the number of responsible teachers to 33 and 15, respectively.

2.4. University criteria for selecting the courses to be virtualized

Each university proposed other criteria for consideration: (1) Courses that could not be implemented in the first cycle had to be rescheduled. (2) Balance in the academic offer of courses in the different degrees and faculties. (3) Common subjects that are taught in all the degree courses of the same Faculty or University School. (4) General courses given in the first and second cycles. (5) First and second cycle courses (Mathematics I and II) or those with the same academic coordinator. It should also be noted that selection in some cases was conditioned by the employment status of the teachers, with those appointed or tenured taking precedence over contracted or temporary teachers.

2.5. Procedure: the techno-pedagogical virtualization process

The process followed for the techno-pedagogical virtualization of the previously selected courses, in general terms, consists of three main stages:

- a) Planning: the work plan is determined and schedules and issues are established and shared with the people involved (students, teachers, authorities and technical staff). In addition, teams and roles will be defined for implementation.
- b) Design and support: starts with the design of the virtualization plan, according to the schedule. This phase is supported by two documents: the "Curriculum Structure Sheet" and the "Monitoring Sheet". Both allow the virtualization progress to be captured.
- c) Implementation (Evaluation and Accompaniment): involves the transfer of what has been learnt and collected in the worksheets to the virtual space (Moodle platform). Thus, the course begins to take shape with a defined structure, contents, activities, spaces for interaction and evaluation system, etc.

Within these three stages, seven phases are defined which, in an integrative manner, are organised around transversal and general themes about the distance learning modality. The structure of stages and phases is set out in the methodology.

2.6. Working strategy during the virtualization process

For optimal development of the virtualization process, general considerations were defined, which were specified according to the university community and the relationship of the context in which it is located.

In this regard, the procedures or methods specified in the following standard actions are applied:

- The development of demonstrations or examples of how to incorporate the different elements that make up a virtual course. As Salazar-Estrada (2022, p.97) points out, "Demonstration allows for greater learning and understanding of certain topics".
- Clearing up doubts and queries at group and individual meetings, according to the needs of the participants (López et al., 2022).
- The practice of individual follow-up of the work done by each teacher in his or her course (Sánchez and Castro, 2022).

Likewise, and based on the 2+3 method, a weekly work methodology was used (2 hours of synchronous group support and 3 hours of asynchronous individual support). In the synchronous sessions, the core topics of virtualization are worked on, examples and demonstrations are given, doubts are resolved and participation is encouraged. Asynchronous sessions are used to resolve questions arising during rollout and are usually of an individual nature.

Communication channels are defined for the development of both synchronous and asynchronous sessions. The sessions held with teachers ranged from large groups per university to small groups depending on the degrees, faculties or professional schools. Due to the level of difficulty expressed by the teachers in the different actions of the virtualization process, it was necessary to increase the synchronous sessions, which became individual, seeking to address specific difficulties, based on "the resistance of teachers, their fears and identifying their strengths in order to build on them", which sometimes hinder the process (Morado, 2017, p.21). In the specific case of two universities, teachers did not have the skills and knowledge of the Moodle platform that was installed for virtualization at the start of the process. The teachers therefore had to be trained in the use and management of this new space.

2.7. Profiles involved in the process

Different individuals played key roles in the virtualization project.

- a) Teacher/Coordinator: academic head of each course or university. Their duties include drawing up the syllabuses and didactic guides and carrying out the self-diagnosis of the course to be virtualized in its initial stage.
- b) Techno-pedagogical advisors: they will work on the design of the final course proposal with the teachers. They will accompany and advise the participants in the different courses.
- c) Academic coordinator of the Consortium: responsible for validation of the course design proposal before starting the development of activities and resources, so that the implementation of the Follow-up Plan is correct.
- d) Technicians: forming the group of technical staff responsible for technological support. They are responsible for training the university's technical staff in all matters relating to the technical support structure.

2.8. Stages, phases, materials and resources for the virtualisation process

Stage 1: Planning

– *Phase 1: Contextualization of the monitoring plan and techno-pedagogical accompaniment (week 1).*

In this phase we present the documents that will serve as reference and support for the novice teacher to understand how to start the process of transforming their face-to-face course into a virtual course. The initial document is used by the teacher to address the change that virtuality entails, to determine the essential didactic components that will make up such courses. The types of learning materials to be used will then be considered: textual, multimedia and digital; types of activities; and tools for interaction and communication. The assessment includes types and stages, actors, techniques and instruments. All these elements are conditioned by the starting structure of each classroom course selected, the contents to be worked on, the communication strategies available and the evaluation and related tasks each teacher has to deal with. The next and final step in this preparatory phase is the definition of the curriculum structure of the e-learning course. The number and type of sessions to be held per week are specified.

With the results of the analysis of the structure of the virtual course and the assessment of the teacher's techno-pedagogical competence, the trainers assigned to the virtualization monitoring and follow-up process have sufficient information to know the needs that have arisen.

Stage 2. Design and accompaniment

– Phase 2: Aligned curriculum design (week 2)

In this phase, the techno-pedagogical advisor engages in the accompaniment process with the teacher through synchronous counselling and training sessions, either in groups or individually. At this point, the teacher must carry out the virtualization of the first three weeks of the course, according to the agreed timetable.

– Phase 3. Feedback session on progress made by the teacher (week 3)

In this third week, the first reflection session on the virtualization process of the course will be held. In the synchronous session, teachers are able to discuss progress made and difficulties encountered. Depending on the level reached, they are offered new resources, strategies, assessment tools, etc., which allow them to enrich their development process. At this point, the feedback from the trainers becomes an instrument with several objectives (Batalla-Busquets and Plana-Erta, 2014): to identify and correct errors; provide the correct answer or most appropriate solution; seek improvement of tasks or work done; provide in-depth feedback to take learning forward in the future. Teachers assimilate and transfer trainers' comments and reviews to improve the virtualization process of their courses.

– Phase 4. Assessment of the learning process of university students (week 4)

Evaluation of the learning process of students in virtual spaces is a fundamental issue for teachers who are starting to virtualize their courses. In order to understand how to carry out evaluation in these environments, it is necessary to assume a series of principles, which according to Cabero-Almenara and Palacios-Rodríguez (2021) are grouped as follows: (a) Learner assessment, from receiver to developer. (b) From receptive learning environments to participatory and interactive environments. (c) From product-focused to performance-focused processes. (d) Transforming a summative evaluation into an authentic one. (e) Changing the exchange produced in class into a community interchange.

– Phase 5. Tutorial action plan (week 5)

This aspect is a resource for monitoring student learning in the remote learning model. In the spaces and moments for tutoring, teachers should take on the role of tutors, and go deeper into subjects complementary to the syllabus, so that cross-cutting issues of particular importance can be addressed.

– *Phase 6. Feedback session on progress made by the teacher (week 6)*

During phase three, it was noted that these sessions provide moments of follow-up and sharing of progress, as well as sharing new tools with teachers.

– *Phase 7. Opening and closing sessions (week 7)*

The importance of the opening (first contact with students) and closing sessions (closing session, conclusions, reviews and farewells) will be discussed, which teachers should consider fundamental in the virtual teaching-learning process.

In relation to the start of the course, as León Naveiro (2016, p.23) points out, "the initial moments of any project are very important. ... The beginning sets the path and affects the results". According to Lozano López (2016),

the teacher must make it clear on this first day what scenario the students are going to encounter: what are the objectives set in the Teaching Guide, the margin for compliance and/or improvisation or incorporation of new elements that may arise in the course of the subject, and the items that the teacher considers essential to estimate that the students are prepared not just to pass an exam, but also to tackle the various challenges offered by the subject. (p.39)

In the same sense, the closing sessions, which are of a conclusive, clarifying and synthesising nature, are considered very relevant. The guidelines for the assessment tests, the tasks to be completed in order to pass the subject, etc., the key points of each of the subjects for the exam are recalled (Ángel et al., 2019).

Stage 3. Implementation

This stage is characterised by the process carried out during the phases defined so far, which allows the transformation of the initial "script" (monitoring sheet) into a course already built on the Moodle platform.

The space provided on the platform for the construction of the course is configured with content, activities, resources for communication and evaluation, etc. In addition, teachers are required to achieve seventeen virtualized weeks. This involves constructing, with their elements, each of the sessions to develop the previously structured contents that will make up the totality of the agenda to be worked on.

2.9. Evaluation of the techno-pedagogical virtualization plan monitoring process

Rubrics have become a valuable tool for process evaluation and for identifying progress in virtualization. As noted by Norman-Acevedo et al. (2020), this assessment can be made concrete with rubrics to guide the course, the teaching and learning process, or any other process, through individual and group indicators. Synchronous meetings between advisors and teachers take place on a weekly basis. Complementary, asynchronous attention is offered at a higher frequency and on an individual basis, via e-mail, consultation forums and WhatsApp groups.

3. Results

Initially, a forecast was made of the courses to be virtualized in each university. MINEDU set out its requirements; each university adjusted them to their specific contexts and criteria; and finally, the Consortium made a selection proposal on the courses to be virtualized. Those selected, finally, were the result of the three decision points indicated above prompting a change between what was initially proposed and what was finally carried out. The actual and final results obtained by each university are shown in table 1.

Table 1. Actual target population by university.

UNIA		UNIQ		UNIFSL-B		UNISCJSA	
Courses	Associate teachers	Courses	Associate teachers	Courses	Associate teachers	Courses	Associate teachers
46	46	43	29	38	24	35	18

It can be seen that the number of courses is associated with the number of teachers responsible for them. In only one case is the number of teachers equal to the number of courses to be virtualized, as the initial aim was to involve as many teachers as possible in the virtualization process. Once the goals had been set, after the process, an assessment was made of the level of virtualization achieved by the different teachers in the assigned courses, for each of the universities, as shown below.

Table 2. Goals achieved in the course virtualization process.

University	Number of courses selected	Number of courses 100% virtualized	Number of teachers involved
UNIA	46	9 (20%)	9
UNIQ	43	12 (28%)	29
UNIFSL-B	14	12 (85,7%)	11
UNISCJSA	35	25 (71%)	18

Based on the results presented, the level of achievement of the teachers, in relation to the number of 100% virtualized courses, was very uneven, with two of the universities reaching a percentage of over 70%, while the other two did not reach 30%. The UNIA counted 37 courses not yet virtualized, although the work approach and previous design of the courses was completely carried out in the absence of the transfer of content to the university's virtual platform. UNIQ, in addition to the 12 fully virtualized courses, had 13 additional courses that were 50% virtualized. At UNIFSL-B, the two courses that failed to reach full virtualization were virtualized in 10 and 11 weeks, respectively, of the 16 teaching weeks, which represents 65% virtualization of the course. Finally, UNISCJSA, in addition to the 25 fully virtualized courses achieved, had 7 other courses with more than 8 weeks virtualized.

4. Conclusions

In line with the work of reflection described in this document, based on the process of assessment and intervention explained in previous sections and in the light of the results reported and set out in the preceding section, it is necessary to explain the reasons that led to the results finally achieved. The explanation that will provide answers about the process and results obtained, after eight months of work, comes through a series of issues for which we are seeking reasons and consequences, such as: connectivity, digital divide, teacher training, techno-pedagogical competences and so on.

First of all, and without losing sight of the initial forecast, the Consortium faced a series of obstacles and difficulties that prevented it from achieving the goals defined. All of them, obstacles and difficulties, related to the issues raised above. Implementation of the process was very demanding and demanding due to the numerous meetings, reports, reviews and monitoring of the work of those involved (university authorities, committed teachers and support trainers, etc.). Moreover, its complexity, not only for the Consortium members, but also for the teachers involved in virtualization of the selected subjects, led to moments of frustration. The teachers' lack of training in technological aspects, the impossibility of combining these tasks with their daily work, and the fact that they were not able to work on the virtualization of the selected subjects, were all made evident.

Considering that the initial project aim was to design, accompany and advise the Peruvian universities identified, with the aim of virtualizing their courses due to COVID-19 and, in view of the results presented, it seems clear that the process achieved a high percentage of success, due to the number of teachers involved in the activity and the scope of virtualization of the courses involved. With the data on the table, only 71% and 85% of 100% virtualization was achieved in two of the universities, although if we consider the data integrating the partially virtualized courses in at least 50%, we would be talking about a global reach of 84.7%, of which 42.02% corresponds to the 100% virtualized courses and 42.7% to the courses virtualized by more than half.

Despite the good data, it should be noted that those cases of lower achievement are due to a series of difficulties and drawbacks, as already indicated throughout the document, which had to be overcome during the process:

- Reluctance and opposition from the university to change its basic model documents, course structure and the inclusion of additional elements beyond its usual teaching practices.

As Corica (2020) indicates, resistance to change on the part of the educational institution and its teachers is conditioned by a sense of instability and threat to the structure of the institution; it is perceived as a test of the work being done or as a threat to their professional identity. When this perception stems from technology, resistance and rejection is greater, as teachers feel that they do not have sufficient methodological and technological knowledge to cope with these changes.

- The complex geographical situation of the institutions, teachers and students makes it difficult to have an appropriate infrastructure to meet the demands of this new

methodology. This is illustrated by statements made by heads of academic institutions highlighting the problems faced by students in remote rural regions in accessing course materials, synchronous sessions or the virtual platform per se.

Many authors have highlighted in their research (Flores and Corral, 2021; Morales, 2021; Muñoz & Lluch, 2020; Vivanco, 2020) the different difficulties and challenges that the change from face-to-face to virtual teaching entailed for teachers and students, as well as for the institutions themselves. Some of these include the dearth of technological skills, lack of space to work synchronously, insufficient network connection for easy access to materials, platform or class sessions, or feelings of isolation, anxiety and stress that have come with so many changes.

- The techno-pedagogical capacity of teachers to develop and adapt the content to their virtual course. The vast majority of teachers did not have the necessary and sufficient training to carry out this task in a totally unfamiliar virtual environment.

In this sense, Chávez (2020) highlights "the relevance of technological inclusion in training processes in the face of adverse situations and the continuous updating that today more than ever teachers must assume in their reflective practice" (p.19), exposing the need for teacher training on issues such as the inclusion and diversification of tools, to facilitate the creation of digital resources, teaching materials or graphic environments of the virtual classroom, with the intention of expanding the possible technological tools incorporated into the training process, as well as streamlining the institution's management systems of the teaching-learning process (support platforms for classroom teaching).

In addition to those already stated, the Consortium was faced with two issues beyond its control and for which it could not take any action, other than designing a support plan for permanent advice and accompaniment, as well as generating documents that would clear up any possible doubts and minimise the pressure situations arising from the lack of clarity and workload.

- Lack of time on the part of the teachers to carry out the work requested, as they had a heavy teaching load in other courses, management tasks, tutoring students, etc.
- Failure of the teachers involved to follow the guidelines set out by the Consortium. The pace demanded, at times, was too much for them.

Analysing the process overall, we understand that there are issues which, without conditioning our work in the virtualization process, deserve to be addressed in greater detail, as they are relevant aspects of the reality intervened.

There is one element for which there is no answer as to the possible impact on this study, and that is the imbalance in women's access to higher education. Perhaps the explanation lies in the fact that most of the studies involved correspond to scientific-technological and health knowledge areas. This difference was also evident in the teaching staff, where the male gender was predominant, with women making up only 33.4% (39 women as opposed to 117 in total) of the teaching staff involved in the process.

One of the most relevant elements that conditioned the virtualization process to a greater extent was the difference in the recipients' understanding of the factors involved in the virtual teaching-learning process. The methodological principles underlying the two realities were understood in different ways, mainly due to two issues. On the one hand, because of the knowledge areas of the professionals and courses involved in virtualization, since a large percentage of them belonged to the aforementioned scientific-technological and health fields; areas that are somewhat distant from the epistemological-didactic reality. And on the other, from the very conception of distance teaching-learning, understood as a mere transfer from the presential to the virtual mediated by a screen. A clear example of this issue is the experience in synchronous virtual classes, where students were forced to remain visibly behind the monitor for the duration of the class, despite the fact that the vast majority recorded the sessions for later viewing. This evinces a lack of understanding of what is meant by the e-learning process.

However, the reality closest to the authors is in line with the Global Connectivity Report (2022), which states that one of the greatest challenges for those disconnected from the network society is no longer directly related to the coverage of internet access, but rather to the acceptance and use that is made of it. The reality in which this virtualization process was working is part of the 5% of the world's population that the aforementioned report states is still physically out of reach of a mobile broadband signal (coverage gap). Furthermore, after the work carried out, it can be stated that other problems that hindered a normal development of the process included the lack of access to a device and the prohibitive costs of connection, as well as the lack of knowledge, skills or abilities to use the technology (usage gap), as already mentioned on several occasions. There are therefore many difficulties, as highlighted by different authors (Anaya et al. 2021; Chanto and Loáiciga, 2020; Flores, 2020; Flores-Cueto et al., 2020; Pinto-Santos, 2022), which can take the form of connectivity, technological resources, alternative complications and drawbacks, unequal access and the widening of the digital divide, inaccessible devices, inadequate appropriation of technology and insufficient teacher training, among others, which become a central and worrying issue.

As described in the body of this document, a way of working was developed that led to the drafting of a guide, which supported the core of the virtualization process during the seven-week period, combining synchronous and asynchronous sessions, always online. (Lavandera-Ponce et al., 2023). The pedagogical strategy chosen responded to the lack of autonomy of the teacher as a designer of teaching and learning experiences. Lack of expertise or experience in virtual contexts was blamed for the inability to perceive and/or solve problems. To overcome these shortcomings, the design of standardised templates was chosen, which was quite positive for the structure of the virtual platform for those who took on the challenge of migrating to new virtual teaching environments for the first time.

Looking ahead, there are a number of issues of concern to the educational and academic world in the aftermath of the pandemic. What has been learnt from this situation? Are we able to implement a methodology capable of challenging time and space? What kind of experiences have allowed us to move beyond a replication of the face-to-face classroom to the screen? To try to answer these questions, we rely on the latest report from the Centre for Public Policy Analysis in Higher Education (2022), presented in May under the auspices of the International University of La Rioja (Spain).

Its aim is to identify, through a prospective approach, the potential scenarios associated with the development of remote university education in Peru by 2030. To this end, both global trends and the Peruvian context have been taken into account.

Despite numerous regulatory changes, since the onset of the pandemic in Peru (face-to-face classes were suspended and adapted to distance learning, guidelines were provided for the continuity of remote educational services, face-to-face classes were authorised in laboratories and workshops at 50% capacity, changing the modality of unlicensed study programmes and giving guidelines for the return to blended and/or face-to-face learning). Ultimately, 81% of the universities consulted agree that there is a high probability that distance education will reach a higher level of consolidation in the coming years and even become a training alternative. They see this possibility as a great option that will democratise access to higher education in Peru.

The study presents four possible prospective scenarios for future distance education, in which the state plays a major role (CAPPES-UNIR, 2022). This is based on ensuring equitable access through the different educational service modalities, promoting policies related to the digital divide and connectivity on a national scale, as well as support to reverse the deficient technological infrastructure and provide due support to public universities. In addition, the document from the Office of Ibero-American States Diagnostic Report on Higher Education and Science post COVID-19 in Ibero-America. Future prospects and challenges 2022, makes a series of recommendations for implementing distance education by 2030 (Santos and Pacheco, 2022).

5. References

- Anaya Figueroa, T., Montalvo Castro, J., Calderón, A. I., y Arispe Alburqueque, C. (2021). Escuelas rurales en el Perú: factores que acentúan las brechas digitales en tiempos de pandemia (COVID-19) y recomendaciones para reducirlas. *Educación*, 30(58), 11-33. <https://n9.cl/tir0b>
- Ángel García, J., Zúñiga Franco, M.Z. y Sainz Elizarraraz, R. (2019). Actividades para el cierre de las sesiones aplicadas en la asignatura de matemáticas. *Conisen. Investigar para formar. Playas de Rosarito, B.C.* pp. 1-13. <https://n9.cl/wd3kk>
- Batalla-Busquets, J., Plana-Erta, D. y Martínez Argüelles, M. (2014). La importancia del feedback en un entorno virtual de aprendizaje. *Revista Oikonomics. Revista de Economía, Empresa y Sociedad (1) (Dossier)*. <https://n9.cl/83lts>
- Cabero-Almenara, J., y Palacios-Rodríguez, A. (2021). La evaluación de la educación virtual: las e-actividades. *RIED. Revista Iberoamericana de Educación a Distancia*, 24(2), 169-188. <https://n9.cl/lc2g1>
- Cabrera Lanzo, N., Guárdia Ortiz, L. y Sangrá, A. (2022). Desarrollo profesional de docentes universitarios en línea: un análisis desde las ecologías de aprendizaje. *Revista EDUCAR*. <https://educar.uab.cat/article/view/v58-n2-cabrera-et-al>
- Centro para el Análisis de Políticas Públicas de Educación Superior (CAPPES) (2022). *El futuro de la educación universitaria a distancia en el Perú: Retos y posibilidades*. UNIR, Universidad Internacional de La Rioja.
- Chanto Espinoza, C. y Loáiciga Gutiérrez, J. (2020). Educandos universitarios: entre la brecha digital y el aprendizaje en tiempos de COVID-19. El caso de Universidad Nacional de Costa Rica (UNA), Sede Región Chorotega, Campus Liberia. *Revista Nuevo Humanismo*, 8(2), 95-122. <https://n9.cl/st2z0>
- Chávez Vargas, J. F. (2020). Herramientas Tecno-Pedagógicas para el Diseño y Desarrollo de Clases en Línea a Nivel Posgrado. *La enseñanza del idioma inglés*;

- un reto para el Sistema Educativo*, 17.
<https://n9.cl/80tov>
- Coicaud, S., Martinelli, S. y Rozenhauz, J. (2021). Recapacitando acerca de la capacitación docente en tiempos de virtualización. *Virtualidad, Educación y Ciencia*, 24 (12), 99-107.
- Córica, J. L. (2020). Resistencia docente al cambio: Caracterización y estrategias para un problema no resuelto. *RIED. Revista Iberoamericana de Educación a Distancia*. <https://revistas.uned.es/index.php/ried/article/view/26578/21369>
- Digión, L. B, y Álvarez, M. M. (2021). Experiencia de enseñanza-aprendizaje con aula virtual en el acompañamiento pedagógico debido al Covid-19. *Apertura*, 13(1), 20-35.
<http://dx.doi.org/10.32870/Ap.v13n1.1957>
- Flores, D., & Corral, M. (2021). *Experiencias docentes normalistas durante la pandemia Covid-19*. En A. Díaz (Ed.), Educación, Innovación y Nueva Normalidad (p.360-375). México: Asociación normalista de docentes investigadores.
<https://n9.cl/qp146x>
- Flores Coronado, M. L. (2022). Calidad educativa. Relación con la brecha digital docente del área de Ciencias Sociales y Humanas. *Universidad y Sociedad*, 14(S2), 112-122.
<https://rus.ucf.edu.cu/index.php/rus/article/view/2768>
- Flores-Cueto, J. J., Hernández, R. M., & Garay-Argandoña, R. (2020). Tecnologías de información: Acceso a internet y brecha digital en Perú. *Revista Venezolana de Gerencia: RVG*, 25(90), 504-527.
<https://n9.cl/tffu5>
- Fondo de las Naciones Unidas para la Infancia (UNICEF) (2021). *Educación Intercultural Bilingüe en América Latina y el Caribe. Avances y retrocesos en el marco de la pandemia de la COVID-19*. UNICEF
- ITU Releases (2022). *Global Connectivity Report 2022*. ITU Publications.
<https://n9.cl/636ht>
- Lavandera-Ponce, S.; Pérez-Sánchez, L.; Mora-Jauregualde, B.; Martín-Cuadrado, A.M. y Rubio-Roldán, J. (Coords) (2023). Orientaciones metodológicas para el asesoramiento y el acompañamiento en un proceso de virtualización de asignaturas en modalidad no presencial. [En Prensa] Octaedro. <https://n9.cl/hpi9b>
- León Naveiro, O. D. (2016). El comienzo del curso, sentando las bases para trabajar y aprender. *Mejorando la actividad docente: «Tips, claves, sugerencias. Tendencias interdisciplinarias para la innovación*, 23.
<https://n9.cl/urkcb>
- López Ortiz, C.A.; Rosales Flores, R.A.; Durán Lizarraga, M.E. (2022). Encuentros y desencuentros en el proceso laboral: Percepción docente en el contexto de la pandemia. *Revista mexicana de investigación educativa*, vol. 27, núm. 93, 407-432
- Lozano López, M. (2016). The first class is the deepest: cómo sobrevivir al primer día de clase. Coloquio-encuentro *Mejorando la actividad docente: «Tips, claves, sugerencias. Tendencias interdisciplinarias para la innovación*, 39. Escuela Técnica Superior de Edificación UPM. <https://n9.cl/bsg53>
- Martín-Cuadrado, A. M., Lavandera-Ponce, S., Mora-Jauregualde, B., Sánchez-Romero, C., & Pérez-Sánchez, L. (2021). Working Methodology with Public Universities in Peru during the Pandemic—Continuity of Virtual/Online Teaching and Learning. *Education Sciences*, 11(7), 351.
<https://doi.org/10.3390/educsci11070351>
- MINEDU y UNESCO-IESALC (2021). Orientaciones para la continuidad del servicio educativo superior universitario. UNESCO. <https://n9.cl/g0rl5>
- Mora-Jauregualde, B.; Pérez-Sánchez, L.; Lavandera-Ponce, S.; Martín-Cuadrado, A.M. y Sánchez-Romero, C. (2022). Acompañamiento pedagógico a universidades nacionales peruanas durante el COVID-19. En S. Carrascal Domínguez y N. Camuñas (Coords.), *Docencia y aprendizaje. Competencias, identidad y formación del profesorado*. (pp.239-268). Ed. Tirant lo Blanch
- Morado, M. F. (2017). El acompañamiento tecno-pedagógico como alternativa para la apropiación de tecnología en docentes universitarios. *Actualidades Investigativas en Educación*, 17(3), 1-24.
<http://dx.doi.org/10.15517/aie.v17i3.29688>

- Morado, M. F. y Ocampo, S. (2019). Una experiencia de acompañamiento tecnopedagógico para la construcción de Entornos Virtuales de Aprendizaje en Educación Superior. *Revista Educación*, 43 (1), 1-26. <https://doi.org/10.15517/revedu.v43i1.28457>
- Morales, M. (2021). Matemáticas aplicadas en escenarios de crisis (Covid-19). *Sapientiae* 6(2), 222-230. DOI: www.doi.org/10.37293/sapientiae62.08
- Muñoz Moreno, J. L. & Lluch Molins, L. (2020). Educación y Covid-19: Colaboración de las Familias y Tareas Escolares. *Revista Internacional de Educación para la Justicia Social*, 9(3), 1-17. <https://n9.cl/h24df>
- Norman-Acevedo, E., Vega, M. E., Cabrales, F. A., & Alarcón, J. P. (2020). Reflexión de la utilización de la rúbrica como elemento de evaluación de la apropiación del conocimiento para la tutoría virtual: Institución Universitaria Politécnico Grancolombiano. *Panorama*, 14(26), 5-13. <https://n9.cl/hwin93>
- Pérez-Sánchez, L.; Lavandera-Ponce, S.; Mora-Jauregualde, B. & Martín-Cuadrado, AM. (2022). Plan for the Continuity of Non-Presential Education in Six Peruvian Universities during COVID-19. *International Journal of Environmental Research and Public Health*, 19(3), 1562. <https://doi.org/10.3390/ijerph19031562>
- Pinto-Santos, A. R., George-Reyes, C. E., & Cortés-Peña, O. F. (2022). Brecha digital en la formación inicial docente: desafíos en los ambientes de aprendizaje durante la pandemia COVID-19 en La Guajira (Colombia). *Formación universitaria*, 15(5), 49-60. <http://dx.doi.org/10.4067/S0718-50062022000500049>
- Salazar-Estrada, M. (2022). Escenarios de creación: La comunicación gráfica en los procesos virtuales de enseñanza y aprendizaje. *Cultura, Educación y Sociedad*, 13(2), 87-104. <https://n9.cl/xvk74>
- Sánchez González, M y Castro Higuera, A. (2022). Mentorías para profesorado universitario ante la Covid-19: evaluación de un caso. *Campus Virtuales* 11 (1), 181-200. <https://doi.org/10.54988/cv.2022.1.1000>
- Santos, J.J. y Pacheco, B. (2022). *Informe diagnóstico sobre la educación superior y la ciencia post COVID-19 en Iberoamérica. Perspectivas y desafíos del futuro 2022*. Organización de Estados Iberoamericanos (OEI).
- UNESCO (2019). *Draft recommendation on Open Educational Resources (OER)*. <https://n9.cl/w5mlz>
- UNESCO (2021). *Los Futuros de la Educación. Aprender a convertirse*. Comisión Internacional sobre los Futuros de la Educación UNESCO. <https://n9.cl/deo08g>
- Vivanco A. A. (2020). Teleducación en tiempos de COVID-19: brechas de desigualdad. *Revista CienciaAmérica* 9 (2), 1-10. <https://n9.cl/epezv>

