From Emergency Remote Teaching to an Online Educational Ecosystem: An Ecuadorian University Case Study

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Abstract: This case study examines the experience of Universidad Andina Simón Bolívar (UASB-E), a traditionally face-to-face institution in Ecuador, as it transitioned to online learning during and after the COVID-19 pandemic. Drawing on data from interviews, surveys, and document analysis, the study explores the challenges and opportunities associated with this rapid shift, offering insights for rethinking and redesigning higher education in the post-pandemic world. Prior to the pandemic, UASB-E primarily relied on face-to-face teaching with limited use of its virtual learning environment. In response to the crisis, the university quickly mobilized to migrate its entire educational offering online, initially adopting an emergency remote teaching approach focused on synchronous videoconferencing. However, student preferences and the need for a sustainable solution prompted UASB-E to rethink its online learning model. The study identifies six key dimensions of UASB-E's improvement in its capacity to deliver online education: (1) Technological Infrastructure and Digital Processes: Enhanced technological infrastructure and streamlined digital processes in management, administration, and academics, laying the foundation for a robust online learning environment. (2) Pedagogical Innovation: Recognizing the limitations of replicating face-to-face teaching online, UASB-E embraced activity-based instructional design, asynchronous online education, and collaborative learning strategies, promoting deeper engagement and personalized learning experiences. (3) Accessibility and Inclusivity: By leveraging the flexibility of online learning, UASB-E expanded its reach beyond its physical campus, reaching students across Ecuador who might not have otherwise accessed higher education, demonstrating the potential of online learning to democratize access to quality education. (4) Programme Diversification: Beyond emergency measures, UASB-E is strategically diversifying its academic offerings, developing new face-to-face, blended, and fully online programmes, allowing for flexibility and catering to diverse student needs and learning preferences. (5) Faculty Training and Development: Implemented a comprehensive training programme focusing on both the instrumental skills of managing online platforms and the pedagogical aspects of designing engaging and effective online learning experiences. (6) Assessment and Feedback: The study highlights the need for a more reflective and analytical approach to assessment and feedback in online environments, with efforts to improve feedback timeliness, individual support, and communication providing valuable lessons for other institutions. Beyond UASB-E's specific experience, the study emphasizes the importance of collaboration and cross-sectoral strategies in building resilient and comprehensive education systems for the future. It also underscores the need for new approaches to learning ecologies that leverage technology effectively while ensuring equitable, inclusive, and high-quality education for all. This case study offers valuable insights for higher education institutions navigating the rapidly evolving landscape of online learning. By understanding the challenges and opportunities that emerged from UASB-E's experience, other institutions can make informed decisions about their own online learning strategies and contribute to shaping a more resilient and flexible future for higher education.

Keywords: COVID-19 outbreak, Emergency remote teaching, Higher education, Online learning ecosystem, Capacity development

1. Introduction

In the early 2020s, the COVID-19 pandemic confined much of the world's population to their homes and paralysed activity in virtually all areas of human endeavour, forcing the educational community to quickly rethink its approach. This unprecedented situation led to the widespread closure of schools and universities, compelling educators to adopt alternative methods to sustain the educational process. As a result, distance learning in a variety of formats and on different online platforms was rapidly deployed to replace traditional educational processes. Experts have dubbed this sudden and unforeseen shift from face-to-face to online 'emergency remote teaching' (Hodges et al., 2020): emergency, because it arose as an immediate, palliative solution to an unexpected lockdown; remote, as opposed to face-to-face, although not necessarily based on sound e-learning models; and teaching, because it focused mainly on instruction rather than learning. In this sense, unlike e-learning models that are designed from the ground up to create a robust online educational ecosystem, emergency remote teaching was a provisional shift of traditional education to an alternative mode of delivery

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in order to continue providing access to education by transferring face-to-face practices to online settings, while maintaining their conventional forms in terms of methodologies, teacher and student roles, types of activities, assessment models, and so on.

Years of research into e-learning have shown that its quality and effectiveness result from a systematic process of design, planning and development grounded in evidence-based theories, models and standards (Hodges et al., 2020; Means et al., 2013). Unlike these robust e-learning models, emergency remote teaching was a provisional shift of traditional education to an alternative mode of delivery to continue providing access to education by transferring face-to-face practices to online settings. Swan (2003) suggests that effective online learning in higher education should provide: (a) clear goals and expectations for learners; (b) multiple representations of course content; (c) frequent opportunities for active learning; (d) frequent and constructive feedback; (e) flexibility and choice in satisfying course objectives; and (f) instructor guidance and support. In turn, Means, Bakia and Murphy (2014) highlight the complexity of the design and decision-making process in online learning through nine dimensions: modality, pacing, student-instructor ratio, pedagogy, instructor role online, student role online, online communication synchrony, the role of online assessments, and source of feedback. The transition to emergency remote teaching forced educational institutions to quickly adapt to maintain instructional continuity. However, despite this rapid adaptation, there is a significant gap in understanding the impacts of this change on educational quality and policies.

The main objective of the present study is to analyse the experience of a traditionally face-to-face Ecuadorian higher education institution in its transition to online learning during the COVID-19 pandemic. The research questions guiding this study are: (1) How effectively did UASB-E implement emergency remote teaching, and what were the key challenges and successes? (2) What strategies and practices emerged as critical for the development of a sustainable online learning ecosystem? (3) How can these strategies inform future higher education policies and practices, particularly in contexts requiring rapid adaptation to unforeseen circumstances?

This paper draws on some of these aspects and dimensions to analyse the process followed by Ecuador's Universidad Andina Simón Bolivar (UASB-E), which was fully face-to-face at the onset of the pandemic, to implement a high-quality and effective online learning ecosystem, a process which initially involved emergency remote teaching. Through a mixed-methods analysis of data collected during and after the state of emergency caused by the pandemic, the paper offers a comprehensive understanding of the complexity of the changes adopted across six dimensions: mode, instructional design, learning environment, interaction and collaboration, assessment and feedback, and students' and teachers' digital literacy. The paper also examines some of the challenges and opportunities of the strategies implemented and their implications for long-term higher education policy, with a particular focus on aspects of capacity building that will be applicable going forwards and may be transferable to other contexts.

2. Research Background

The COVID-19 crisis had a profound impact on all sectors of society, deepening structural inequalities and creating new ones. In higher education, the abrupt shift to emergency remote teaching had various consequences in areas such as teaching, socio-emotional well-being, labour, finance and academic mobility (Pedró, 2021). These were particularly acute in countries with historically high levels of inequality, such as Latin America and the Caribbean (LAC). A UNESCO report (UNESCO IESALC, 2020) estimated that by the end of March 2020, the temporary closure of higher education institutions had affected some 23.4 million students and 1.4 million teachers in LAC countries.

In terms of teaching, the limited access to internet connectivity and technological equipment (52% of LAC households in 2020), the incipient and extremely uneven provision of distance higher education among LAC countries (15.3% in 2017) and the limited digital literacy of academic staff and students suggest a negative balance in terms of quality of learning and equity in access (Pedró, 2021).

During the health crisis, countries such as Ecuador, Colombia and Peru had to make important regulatory changes to authorise their universities to develop and deliver distance education courses. The reason why distance higher education occupied such a peripheral position was that the public, including most teachers and students, perceived it as a substitute (and not necessarily a quality one) for face-to-face higher education (Pedró, 2021), despite research showing otherwise.

The educational tools and applications used for emergency remote teaching, including videoconferencing platforms and virtual learning environments, posed a challenge to educators with no previous experience of

online teaching and learning, as they were suddenly expected to teach in a new way without the appropriate training. Teachers and students alike soon discovered that the online spaces that had been hastily created in response to the emergency lockdown could not satisfactorily replicate face-to-face practices.

Some of these negative effects could have been mitigated by adopting a more reflective model of online education, based on previous experience with e-learning (CEPAL-UNESCO, 2021). This would have allowed institutions to address not only continuity criteria, but also those of equity and inclusion.

2.1 The Situation in Ecuador

The first reported case of COVID-19 in Ecuador occurred on 29 February 2020. Fifteen days later, the Ministry of Education ordered the nationwide suspension of face-to-face classes. This measure represented a major challenge for the educational community, which had to design and implement strategies to guarantee the universal right to education remotely in a country with unequal access to information and communication technologies (UNICEF, 2022). According to the National Institute of Statistics and Censuses of Ecuador (INEC, 2021), in 2019 only 45.5% of the country's population had access to the internet, with a large gap between urban (56.1%) and rural (21.6%) areas. Furthermore, only 23.3% of the population had access to a desktop computer and only 28.5% to a laptop or tablet. Although these figures have improved in the years since the pandemic, education indicators also show that the pandemic widened the education gap, particularly in rural areas and certain Amazonian provinces.

Given the incipient, sporadic and unsystematic penetration of online learning in higher education institutions across the country, the shift from face-to-face to remote teaching posed multiple challenges. There were also pre-pandemic structural challenges and shortcomings at play that have not been fully resolved and continue to exist at different levels and intensities in different institutions. As Araujo Silva, Ochoa Mogrovejo and Vélez Verdugo (2020) point out, these challenges relate to areas such as management models, disconnection from the professional world, diversification of supply, inequalities in access, conflicts between research and teaching, and gender inequalities.

In October 2020, the Higher Education Council (Consejo de Educación Superior, 2020), which regulates higher education in Ecuador and was aware of these limitations, issued a regulation to allow higher education institutions to adapt to the reality of successive lockdowns. This regulation, which is still in force, made it possible to move programmes online or to modify the hours allocated to teaching. It created a hybrid model that combined features of blended, online and distance learning and prioritised autonomous student work. This regulation also provided for the creation of a repository of recordings of synchronous videoconferencing lessons, introduced study guides for autonomous learning for students who did not have access to technological means, and made professional practices, timetables, student/classroom ratios and attendance requirements more flexible.

This regulation has given higher education institutions in Ecuador a great deal of freedom over the last three years, particularly in terms of how programmes are taught. However, in the next academic year, this regulation will be phased out and the exemption will end, forcing institutions to take action to continue offering online programmes that were originally designed and approved for face-to-face delivery.

3. Research Design and Method

This case study focuses on the transformation process undertaken by Ecuador's Universidad Andina Simón Bolivar (UASB-E) to implement an online learning ecosystem in response to the educational needs arising from the pandemic. The UASB-E specialises in postgraduate, master's, and doctoral programmes. In fact, it has the largest catalogue of postgraduate courses in Ecuador, with extensive international cooperation and exchanges of teachers, researchers and students from the Andean subregion, Latin America, North America, and Europe. At the outbreak of the pandemic, it offered a total of 14 postgraduate degrees, 27 profession-focused master's degrees, seven research-focused master's degrees, seven doctoral degrees and two postdoctoral degrees. These degrees are divided into nine faculties: Environment and Sustainability, Letters and Cultural Studies, Law, History, Health, Education, Social and Global Studies, Communication and Management. This scenario has changed significantly in the years following the pandemic.

The study utilised a mixed-methods approach, integrating a phenomenological perspective with quantitative methods, to thoroughly understand the transformation process at UASB-E. This approach merged qualitative and quantitative techniques to collect data from various stakeholders involved in the educational process. The mixed-methods design was selected to offer a robust analysis by triangulating data from multiple sources,

thereby enhancing the reliability and depth of the findings. Five techniques were used to collect data from the perspective of different educational stakeholders and decision-makers (Table 1): (1) interviews with academic directors; (2) institutional documentary analysis; (3) a synchronous online focus group; and (4) surveys of teachers and students, (5) analysis of online classroom instructional design an academic data.

Table 1: Summary of methodology

Research questions	Research techniques	Actors/Sources	Data collection		
			2021	2022	2023
RQ1. How effectively did UASB-E implement emergency remote teaching, and what were the key challenges and successes?	Institutional documentary analysis	Guidelines for non-face-to-face education			
		Pedagogical model of distance education			
		Guidelines for an educational process in remote modes			
	Surveys of students	Students from all faculties			
	Secondary data analysis	Academic data			
	Online classroom analysis	The virtual learning environment classrooms of the Faculty of Education's programmes			
RQ2. What strategies and practices emerged as critical for the development of a sustainable online learning ecosystem? **RQ3. How can these strategies inform future higher education policies and practices, particularly in contexts requiring rapid adaptation to unforeseen circumstances?**	Interviews with academic directors	The general academic director.			
		The director of the Virtual Education Management Department			
		The dean of the Faculty of Education			
	Synchronous online focus group	2 teachers from the Faculty of Education			
		2 students from the Faculty of Education			
	Surveys of students	Students from three master's degree programmes at the Faculty of Education			
	Surveys of teachers	Teachers from all Faculties			

The aim of the interviews was to identify the opportunities and obstacles encountered in the process of moving the university's programmes online in response to the needs created by the pandemic, from the point of view of three key decision-makers: the general academic director of the UASB-E, the director of the Virtual Education Management Department and the dean of the Faculty of Education.

The documentary analysis focused on the documents that set out the guidelines and regulations for emergency remote teaching after the outbreak of the pandemic and the subsequent proposal of a pedagogical model for online learning in the new normal. Three documents were analysed for this paper: (1) *Guidelines for non-face-to-face education*, developed by the Virtual Education Management Department to define the actions, strategies and measures to be implemented for non-face-to-face education in times of contingency; (2) *Pedagogical model of distance education*, which defines the UASB-E's model of distance education as a technological ecosystem of services, resources, networks and virtual learning environments that interact with each other; and (3) *Guidelines for an educational process in remote modes*, developed for the Faculty of Education.

The synchronous online focus group involved two teachers and two students from the Faculty of Education. It helped to explore various aspects of the lived experience of teaching and learning remotely, including the required skills and the pros and cons of online education. The focus group was conducted via videoconferencing and recorded for later analysis.

Several types of surveys were conducted: (1) a survey administered to a sample of 166 students from three master's degree programmes at the Faculty of Education, which was answered by a total of 129 students (78% of the sample); (2) institutional surveys administered to students in the 2020/2021 and 2021/2022 academic years, which asked about the teaching process and the mode of study and included dimensions related to

teaching, learning activities and learning tools; and (3) institutional surveys administered to teachers regarding their capacity building needs.

Finally, we also analysed the design of classroom instruction for the Faculty of Education's programmes in the virtual learning environment in the 2020/2021 academic year, and academic data for 2020/2021, 2021/2022 and 2022/2023.

4. Findings and Discussion

Although the UASB-E was a 100% face-to-face university before the pandemic, it maintained a virtual learning environment for occasional use as a support space for face-to-face teaching and eventually for professional training events and open courses. Essentially, the virtual learning environment was used as a repository of materials to support teaching and learning.

4.1 Evolution and Enhancement of Techno-Pedagogical Model at UASB-E

In October 2019, the Virtual Education Management Department carried out an internal review and validation of the instructional and graphic design of the university's virtual learning environments (collectively referred to as Andina Virtual). The new model described the design of virtual courses based on the generic ADDIE methodology. This model made it possible to specify the design processes of the learning environments in the Andina Virtual system and the principles that would be applied in each phase, such as 'Merrill's (2002) first principles of instruction, Gagné's learning events (Chen and Johannesmeyer, 2021) and Kirkpatrick's evaluation model (Cahapay, 2021). This design led to several proposals for virtual classrooms for postgraduate programmes and other training activities, such as extension courses, professional training and MOOCs.

The model distinguished between four types of virtual classroom: (1) link classrooms, designed for courses whose main resources are reading materials such as digital documents, e-books, handbooks and tutorials; (2) lecture classrooms, designed for courses that use multimedia elements such as audio, video, simple animations, handbooks and interactive tutorials, complemented by other tools outside of Moodle; (3) iconographic classrooms, designed for self-study courses, with dynamic content structured according to a visual scheme using familiar icons associated with the subject of the course; and (4) interaction classrooms, where instruction is synchronous, allowing webinars, seminars, master classes, conferences and the like to take place live and encourage real-time interaction.

When the pandemic broke out in the 2019/2020 academic year, the UASB-E had 1,295 students with whom it undertook to continue all educational activities remotely, according to the possibilities of each teacher, either by using videoconferencing tools, virtual classrooms, email and telephone communication or by requesting the delivery of final papers. These remedial solutions required many decisions and actions to be taken in a very short period of time, especially those related to technological infrastructure, training and support for academic staff and students, and administrative management. This period was also characterised by the widespread adoption of the synchronous model based on videoconferencing (Herrera-Pavo, Amuchástegui and Balladres, 2020), although other models were also explored, including the asynchronous collaborative model. It was clear to the academic community that the shift was not to an e-learning model, but to emergency remote teaching.

During the pandemic, the UASB-E strengthened its technological infrastructure and digital processes in the areas of management, administration and academics. These new strengths, as well as the experience of emergency remote teaching, allowed it to rethink its pedagogical model and make it more complex. During this period, it began to promote activity-based instructional design, asynchronous online education and collaborative learning strategies.

The spread of the pandemic made it clear to the academic community that it would continue to operate online during the following academic years (2021/2022 and 2022/2023). The UASB-E was therefore compelled to take steps to digitalise processes that would facilitate its operation as an online university. These steps included the design of a techno-pedagogical ecosystem for online learning that would ensure quality and inclusive education in various non-face-to-face modes, thereby promoting a new learning ecology (Estévez, Souto-Seijo, and Romero Rey, 2021). Below is a discussion of the main dimensions of the techno-pedagogical ecosystem implemented by the UASB-E (Figure 1): mode, instructional design, learning environment, interaction and collaboration, assessment and feedback, and students' and teachers' digital literacy.

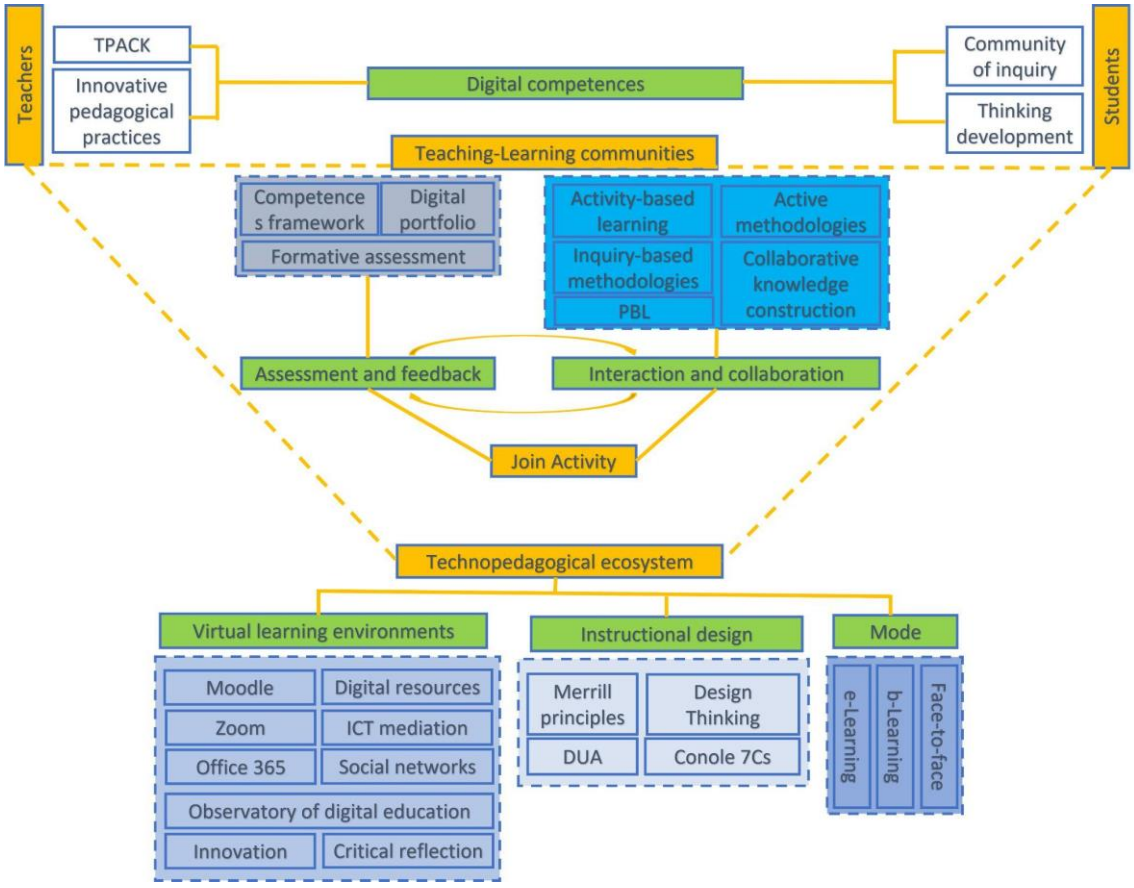

Figure 1: Andina Virtual techno-pedagogical model

4.2 Evolution of Educational Delivery Modes at UASB-E: From Pre-Pandemic to new Realities

The UASB-E gradually returned to face-to-face teaching in 2023. However, only 90 students from eight programmes (three doctoral programmes, four research-focused master's degrees and one profession-focused master's degree) returned to campus, while the rest (1,205 students from the other 42 programmes offered by the university in 2023) remained online, taking advantage of the exceptional measures decreed by the Higher Education Council (CES) to deal with the pandemic, which were still in force.

In a survey of students in March 2023, only 15.9% said they preferred the face-to-face mode; the rest preferred some degree of online education: fully online learning (32.4%); blended learning, understood as a combination of online and face-to-face learning (28.28%); or hybrid learning, combining simultaneously different modes (21.3%).

Faced with this reality, the Office of the General Academic Director proposed greater flexibility in the educational model (Veletsianos and Houlden, 2019) to ensure that the UASB-E would maintain its vocation as an institution that gives an important place to face-to-face teaching, especially in programmes with a strong research component, while also venturing firmly into online education by organising online courses and using all available technological resources to support face-to-face and blended programmes (Chaw and Tang, 2023), thus leaving no student behind.

Although the pandemic took its toll on higher education in general, by continuing to offer its courses remotely through videoconferencing platforms and its Andina Virtual system, the UASB-E was able to reach all the provinces in Ecuador, including students who would not normally be able to travel to the Quito campus. In this regard, it is aware that it must not lose the ground it has gained when the situation returns to normal, and must therefore diversify its catalogue of academic degrees through different modes that are compatible with the field of study and the specific content of each programme. The result will be face-to-face, blended and online programmes.

In 2023, the UASB-E officially offers only seven degrees with some amount of online learning, five of which are offered by the Faculty of Education. In 2024, after the end of the pandemic regulatory exception, all programmes must be offered again in the mode in which they were approved by the CES, in accordance with the provisions of this regulatory body. Faced with this reality, in March 2023, the Office of the General Academic Director asked the faculties to make adjustments to their programmes in order to obtain approval from the CES before the start of the next academic year. In turn, the faculties requested adjustments in order to increase the proportion of online teaching in 51 of the 60 programmes that make up the 2024 course catalogue. Of the 41 face-to-face programmes, 22 requested to continue as face-to-face programmes, maximising the margin of online teaching up to the 49% allowed by the regulations; 14 requested to be blended, with 65% online teaching; and five requested to become 100% online. Of the ten blended programmes, nine are increasing online teaching to 65% to reach the maximum allowed by the regulations, and one is becoming 100% online (Figure 2).

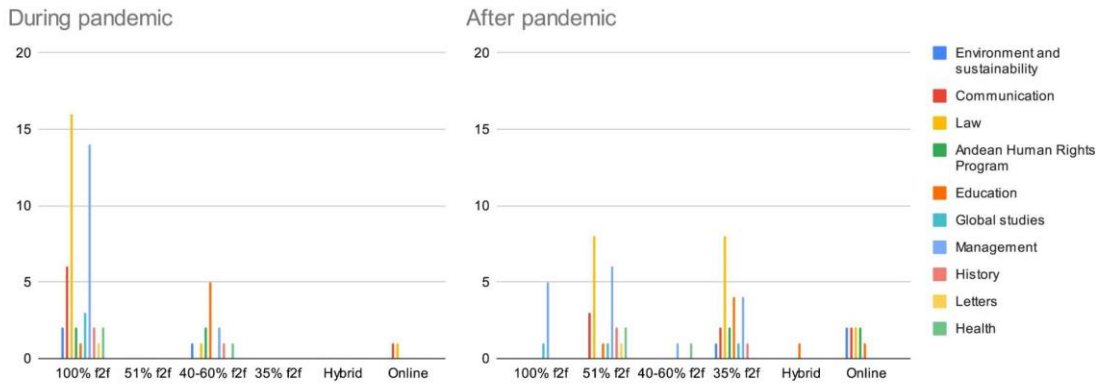

Figure 2: Online education during and after the pandemic

In summary, nine programmes will be 100% face-to-face, 22 will be 49% online, 23 will be 65% online and six will be fully online. By next academic year, the UASB-E will have gone from 100% face-to-face before the pandemic to 42% face-to-face, with more than half of its courses officially moving online.

Additionally, the UASB-E recognises that its venture into new modes requires the development of an e-learning model, together with initiatives for the professional development of teachers on online education issues. The asynchronous model based on collaborative activities promoted by the Faculty of Education and the Virtual Education Management Department itself is gaining ground in the discussion of the new model.

4.3 Instructional Design

The university programmes' clear shift towards online learning implies decisions related to instructional design, as the relevant regulations require that online programmes and courses have a virtual classroom, a complete learning guide and pre-designed educational resources (Arghode, Brieger, and Wang, 2018).

During emergency remote teaching, these requirements were flexible, allowing traditional face-to-face education models to be transferred to synchronous online classes delivered using videoconferencing tools. However, for programmes that are to be officially approved for online delivery, there needs to be an instructional design process in place to ensure that the requirements of the regulatory body and the expectations of the university community are adequately met.

In 2022, in order to assess the Faculty of Education's instructional design practices, an analysis was carried out on the 163 course classrooms that it had created in Moodle during the 2021/2022 academic year for its postgraduate programmes. The results showed that 18.4% of the virtual classrooms were empty, meaning that the courses were taught using tools outside of Moodle; 5.5% of the classrooms were designed for the presentation and distribution of study materials only; 30.7% of the classrooms were designed for the distribution of materials and the performance of compulsory individual activities; 8% of the classrooms were designed for the distribution of materials and the performance of compulsory individual and/or group activities; and 37.4% of the classrooms were designed for the distribution of materials and the performance of individual and/or group activities, including compulsory collaborative work.

These courses and their classrooms were designed by 54 teachers, of whom 22.2% did not use the virtual classroom for teaching. In comparison, 7.4% used the classroom only to present and distribute materials, 37%

integrated study materials and individual assignments into their virtual classrooms, and 27.4% integrated materials and group work and interwove them with individual activities. Only 5.6% proposed collaborative group activities.

From this analysis, it is possible to identify the training and support needs of teachers, as well as the coordination needs of the programmes, so that those being redesigned for online delivery in 2023 can be rethought according to an e-learning model based on collaborative work that fully exploits the potential of online education.

In this sense, the Office of the General Academic Director, the Virtual Education Management Department and the Faculty of Education have set up an advisory process for the techno-pedagogical design of each of the programmes that will be offered online in the next academic year. This process consists of five phases: (1) creation of the programme's competency framework; (2) techno-pedagogical design of the programme; (3) creation of learning guides; (4) creation of learning resources; and (5) classroom design. The aim of this process is to develop an e-learning model based on collaborative work with a high degree of asynchrony, in which videoconferencing is used occasionally and mainly for tutoring processes.

4.4 Learning Environment

Andina Virtual organises the teaching-learning interaction process around personalised Moodle and videoconferencing tools. The system hosts the virtual classrooms of postgraduate courses, the faculties' online courses and the workshops.

According to teachers and students, 79% of postgraduate courses in 2022 were delivered using the Zoom videoconferencing platform. The use of Zoom for synchronous teaching focused on five main resources: screen sharing (89%), audio sharing (79%), video sharing and class recording (77%) and the creation of breakout groups (70%), while the digital whiteboard, integrated applications and support services options were used by less than 54%. Only 35% of teachers used the Moodle platform to manage asynchronous classes and share study materials. Moodle resources for content management were concentrated in files (86%), folders (79%) and links (71%), while activities were mainly carried out as tasks (85%) or forums (65%). In addition, 11% of teachers integrated the Office 365 platform into their teaching. These practices align with those identified in other studies, including the research conducted by Bernardo and Duarte (2020).

The Moodle environment was updated at the end of 2022 to improve the student experience in terms of activity performance, accessibility and anti-plagiarism support. It also introduced tools to encourage interaction and collaboration, as well as formative assessment and feedback. These included Board, a collaborative bulletin board; Learning Map, a resource for creating a map-like learning path format; and Exabis ePortfolio, a tool for creating a portfolio from competency frameworks. This improvement took into consideration students learning characteristics to improve their overall learning experience (Chaw and Tang, 2023).

4.5 Interaction and Collaboration

According to Hodges et al. (2020), careful planning of online learning involves not only the delivery of specific content, but also a focus on how to support the different types of interaction that are essential to the learning process, including student-to-content, student-to-student and student-to-teacher. This approach recognises that learning is both a social and a cognitive process, not just a matter of information transfer.

At the beginning of the pandemic, face-to-face course plans were transferred directly online, resulting in a kind of diminished face-to-face teaching-learning experience, with videoconferencing lectures dominating. Some changes were made once emergency remote teaching became less urgent and teachers had the opportunity to train, but lectures and videoconferencing remain at the heart of the UASB-E's teaching offer (Figure 3). Work is under way to change this in order to encourage synchronous and asynchronous interaction and, therefore, learning.

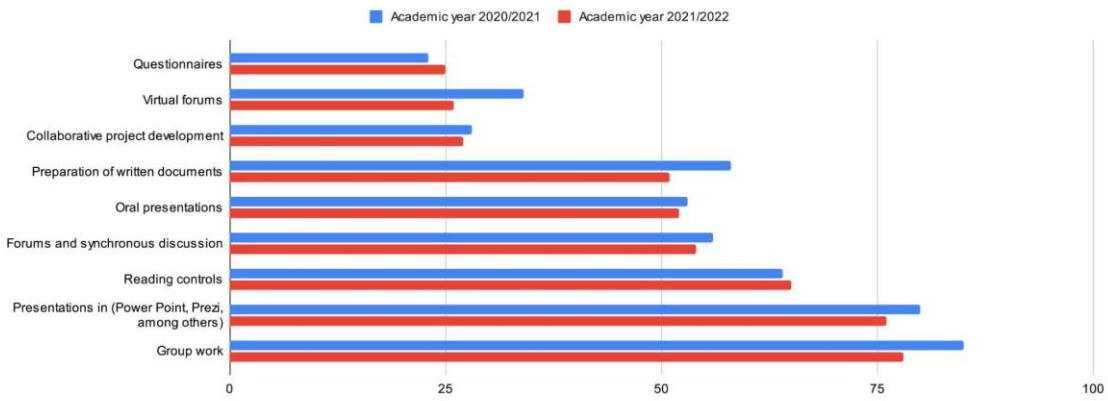

Figure 3: Most common learning activities according to students

The learning activities that teachers provide for students in the synchronous model consist of reading, debates, essays and presentations. However, as shown in Figure 4, this is all based on group work, a classic approach in higher education. This means that there is room for collaborative work based on projects and asynchronous interaction through virtual forums. The university wants to encourage this trend by providing training and support in the instructional design processes of the new programmes.

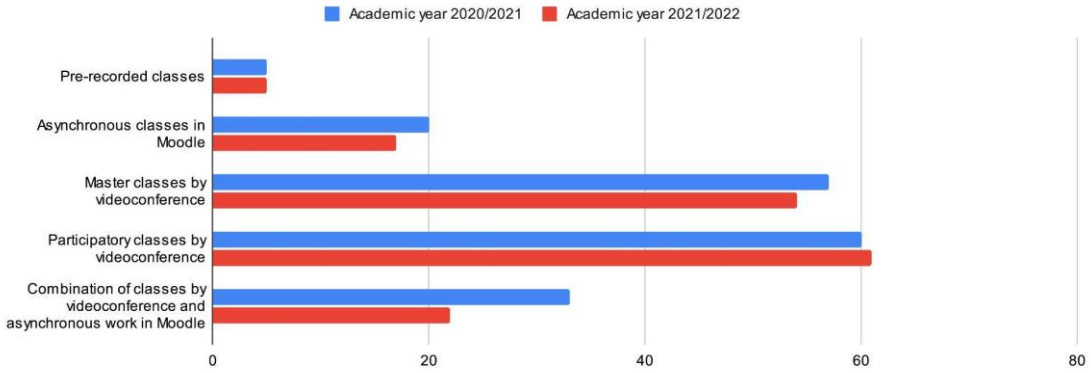

Figure 4: Teachers' main instructional proposals, according to the students

Students agree with this approach. They think it is necessary to make lessons more participatory, to diversify teaching strategies and to balance individual and collaborative work dynamics. However, collaborative work requires not only trained teachers to implement it, but also training for students who are overly accustomed to individual work dynamics (Herrera-Pavo, 2021).

4.6 Assessment and Feedback

The restrictions imposed by the pandemic also affected traditional assessment practices, which are mostly based on summative models, by making it impossible for assessors and those being assessed to be in the same physical space. One of the main challenges for higher education institutions in this regard was how to replace place-based assessment with technology-mediated remote assessment (Whitelock et al., 2021).

Most of the programmes at the UASB-E employ a combination of formative assessment and final projects in each course, with exams being a marginal practice. Although the assessment of students' mid-course activities and final projects has not been an issue, the loss of face-to-face contact has hindered feedback processes. This is because these have traditionally been dialogue- and classroom-based and have proved unwelcoming to the move online, whether to synchronous or asynchronous formats.

In the survey on the teaching process carried out in the 2020/2021 academic year, 53% (359) of students considered the assessment of learning to be adequate, followed by 36% (244) who considered it to be very adequate, while the remaining 11% (77) indicated that it was not very adequate or inadequate. In terms of feedback, 50% (339) of students found the guidance provided by their teachers during this period to be

adequate, 41% (277) found it to be very adequate and the remaining 9% (64) found it to be not very adequate or inadequate. For the 2021/2022 academic year, the results are very similar: 51% (198) of the students surveyed said the assessment was adequate, 43% (167) said it was very adequate and 6% (21) said it was not very adequate. We also found similar data in relation to teacher guidance during this period: 49% (191) of students found it adequate, 46% (177) found it very adequate and 5% (19) found it not very adequate or inadequate.

These figures show that most students were satisfied with the assessment model and teacher guidance introduced during emergency remote teaching and its subsequent development, which aligns with the findings of the study by Tejedor, Cervi, Pérez-Escoda, and Tusa Jumbo (2020). However, in the comments collected through these surveys, students asked for faster turnaround times in terms of assessment and feedback before starting new topics, for more teacher involvement in individual student support, for better communication and for better coordination to avoid overlapping assessment processes in different courses. Where there were exams, students asked for appropriate feedback, not just a mark.

The figures suggest a high level of student satisfaction with the assessment and feedback processes. However, our conversation with students and teachers in the online focus group revealed that there is a need to explore feedback, guidance and assessment alternatives in synchronous and asynchronous online scenarios. This was one of the most prominent training needs expressed by teachers in the training needs survey. It is also one of the most critical factors when it comes to defining an educational model, instructional design and the development of learning environments.

4.7 Teachers' and Students' Digital Literacy

When the pandemic began, most UASB-E teachers lacked experience with online teaching and the virtual learning environment, consistent with findings from studies such as the one conducted by Tejedor, Cervi, Pérez-Escoda, and Tusa Jumbo (2020). The Virtual Education Management Department's initial challenge was to equip teachers with the skills needed to use the Moodle platform and other online education tools. This included training for synchronous teaching with Zoom, enabling features such as breakout groups for collaboration, and for asynchronous teaching using Moodle for communication and collaboration.

Before 2019, postgraduate teacher training on virtual platform management was conducted in-person and on demand. Due to the pandemic, all training shifted online, and in 2020, a permanent training process was established to address the needs arising from emergency remote education. By 2021, with most teachers proficient in virtual platform management, training became more personalised, with induction workshops at the start of each academic cycle, small group sessions by faculty, and individual training.

The Virtual Education Management Department developed a Digital Education Resources website, providing tutorials, recorded lessons, and a Teachers' guide to managing virtual platforms, which includes advanced tutorials on classroom management. In 2022, a catalogue of training and advisory services was launched, operational from January 2023, dividing services into planned training for online education methodologies and on-demand advice for digital resource development and course design. In 2022, 73 teachers participated in nine training and 30 advisory sessions.

In February 2022, UASB-E issued its Instruction on Common Provisions for Blended or Online Programmes, requiring teachers to have 120 hours of certified online education training. A corresponding training course and competency assessment test, based on the European Framework for the Digital Competence of Educators (DigCompEdu), were introduced, covering digital resources, pedagogy, assessment, and student empowerment.

A June 2022 training needs survey revealed that 58% of teachers were not using the virtual classroom, with identified needs in creating e-activities (15%), using feedback and tracking tools (15%), and setting up the grader (17%). Conversely, 78% of teachers used videoconferencing platforms, with 54% needing training on managing integrated applications. Managing digital videoconferencing platforms (Zoom, Teams, and Google Meet) was the top training need (38.57%).

Based on these findings, the Virtual Education Management Department continued training in videoconferencing tools and the virtual learning environment, organising open micro-training for other tools. In 2023, an individualised collaborative advisory process was established to support the virtual and techno-pedagogical design of online programmes for the next academic year.

For students, UASB-E initiated an induction course on academic honesty, the Code of Ethics, and gender and intercultural issues in 2019. Previously, induction for managing virtual platforms was in-person, requested by teachers of face-to-face courses with virtual classroom support. From 2020, as teaching moved online, more

extensive and continuous induction processes were required, including live sessions during the first or second week of each academic cycle, complemented by recordings and tutorials in the digital resource repository.

In 2022, the induction course for new students expanded to cover digital library services, the academic management system, and the virtual classroom. A preparatory course for blended and online degrees was introduced to instruct students on using Andina Virtual resources and activities. Additionally, a support service was established to provide guidance on platform use, technical support, and registration assistance.

5. Conclusions

This study examined the rapid transition of Universidad Andina Simón Bolívar (UASB-E) from a fully face-to-face institution to a robust online learning ecosystem during and after the COVID-19 pandemic, identifying six key dimensions that enhanced the delivery of online education: (1) technological infrastructure and digital processes, (2) pedagogical innovation, (3) accessibility and inclusivity, (4) programme diversification, (5) faculty training and development, and (6) assessment and feedback.

With respect to the first key dimension, UASB-E's response to the pandemic and its subsequent development included significant enhancements. Before the pandemic, UASB-E primarily used its virtual learning environment as a supplementary tool for face-to-face instruction and professional training events. However, the outbreak necessitated a swift and comprehensive shift to remote education. The actions taken involved the construction of a complex, adapted, and enriched virtual environment tailored to the needs of online educational processes, along with the simplification of digital processes in management, administration, and academics to support teaching and learning, thereby laying the foundation for a robust online learning environment.

Regarding pedagogical innovation, by promoting an activity-based instructional design model and collaborative learning strategies, UASB-E ensured that its online learning environment incorporated essential elements of effective online learning: clear goals and expectations for learners, multiple representations of course content, frequent opportunities for active learning, frequent and constructive feedback, flexibility and choice in meeting course objectives, and strong instructor guidance and support. This comprehensive approach ensured a high-quality online learning experience. It supported the university’s goal of maintaining a strong presence in both face-to-face and online education, providing a balanced and inclusive educational model.

Concerning accessibility and inclusivity, the shift to online learning and the introduction of new digital services (library, administrative offices, support departments, etc.) not only facilitated the continuity of education but also improved accessibility for students who would otherwise be unable to study. This accommodated diverse needs and learning preferences, demonstrating the potential of online learning to democratize access to quality education.

Based on this premise, the university expanded its academic offerings to include a diverse range of face-to-face, blended, and online programmes, promoting flexibility. This programme diversification allowed UASB-E to cater to a wide array of student needs and preferences, further strengthening its educational model and ensuring it could adapt to various learning scenarios.

Concerning teacher training and professional development, the university's Virtual Education Management Department played a crucial role in the transition. Initially, it focused on equipping teachers with the necessary skills to use online tools such as Moodle and Zoom for synchronous and asynchronous teaching. The department later created a Digital Education Resources website and a robust programme for developing and certifying digital skills among teaching staff, ensuring they were well-prepared for the new mode of instruction.

Finally, this case study underscores the importance of exploring alternatives for feedback and assessment in synchronous and asynchronous online scenarios, improving feedback timeliness, individual support, and communication for a more effective educational model. In this regard, a more reflective and analytical approach to these processes is necessary to provide a more appropriate instructional design.

The pandemic highlighted the importance of flexible and resilient educational models, and UASB-E's experience drew attention to several key practical and theoretical implications for higher education. Practically, institutions should invest in robust technological infrastructure and embrace flexible learning models that can accommodate diverse student needs. Developing comprehensive digital literacy programmes for teachers and students is essential for effective online education. Theoretically, the success of UASB-E's transition illustrates the complexity of the design and decision-making process in online learning, which involves multiple dimensions: modality, pacing, student-instructor ratio, pedagogy, instructor role online, student role online, online

communication synchrony, the role of online assessments, and source of feedback. Addressing these aspects ensures a comprehensive and effective online education framework.

UASB-E's experience presented and analysed in this case study provides valuable insights into building resilient and inclusive education systems capable of adapting to unforeseen circumstances. The university's strategic enhancements in technological infrastructure, instructional design, and digital competency development have not only ensured the continuity of education during the pandemic but have also set a foundation for future growth and innovation. By prioritising flexible learning models and collaborative strategies, UASB-E has demonstrated the potential for higher education institutions to maintain high-quality education across various delivery modes. These efforts have equipped the university to meet the evolving needs of its student body and to contribute to the broader discourse on effective online education practices. This study underscores the importance of a systematic and adaptable approach to online education, which is essential for fostering a resilient and inclusive learning environment in the face of future challenges. The lessons learned show the need to build collaborative alliances as part of an interdisciplinary and cross-sectoral strategy to achieve a resilient and comprehensive education system at all levels in the face of future contingencies. Educational technology plays a fundamental role in this agenda, but new approaches to learning ecologies are required to ensure equitable, inclusive and high-quality education and to support personalised learning.

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