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## Unveiling the post-pandemic hybrid education: Students' and professors' perspectives on the contingent virtual education modality

### Develando la educación híbrida post-pandémica: Perspectivas de estudiantes y profesores sobre la modalidad virtual de educación

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**Abstract:** This study used a mixed parallel-convergent typology design to assess the impact of “pandemic pedagogies” on professors and students. Online surveys and in-depth interviews Survey findings showed that most educators reported medium to high competence in technology, organizational and student management, alongside stressors related to virtual education's impact on their quality of life. Similarly, students experienced physical fatigue, boredom, exhaustion, and passivity. Interviews revealed educators' aspirations to address these challenges, secure enhanced administrative support, and strengthen pedagogical management. Pandemic pedagogies revealed learning challenges and opportunities for transformative changes in nursing education across all levels.

**Keywords:** Distance education, Online learning, Knowledge Management, Nursing, Education

**Resumen:** Se realiza un diseño mixto paralelo-convergente para evaluar el impacto de la “pedagogía pandémica” en profesores y estudiantes. Mediante encuestas en línea y entrevistas en profundidad se identifica que la mayoría de los educadores informan una competencia media a alta en tecnología, organización y gestión de estudiantes, así como estresores relacionados con el impacto de la educación virtual en su calidad de vida. Los estudiantes experimentan fatiga física, aburrimiento, agotamiento y pasividad. Las entrevistas revelan las aspiraciones de los educadores para abordar estos desafíos, asegurar un mejor apoyo administrativo y fortalecer la gestión pedagógica. La pedagogía pandémica muestra retos para el aprendizaje y oportunidades de cambios transformadores para la educación en enfermería.

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**Palabras clave:** Educación a distancia, Aprendizaje virtual, Manejo del conocimiento, Enfermería, Educación

**Introduction.** Virtual education is an effective and long-standing educational modality that can be as successful as face-to-face education (Prestiadi et al., 2020; Swan, 2003). Prior to the COVID-19 pandemic, in 2020, virtual education was a promising platform for nursing education because it can be implemented at large scale, allowing both appropriate online classroom presentation (Barbosa et al., 2021; Chen et al., 2020) and virtual lab participation (Foronda et al., 2020; Shorey & Debby, 2021) at any distance.

The pandemic, however, led to a different implementation of online education when conventional educators were harshly forced to migrate to distance education strategies. For the purposes of this study, this scenario will be referred to as pandemic pedagogies. Considering the reduced physical mobility, most higher education institutions used videoconferencing platforms and virtual learning environments to deliver resources and enable asynchronous interaction between students and tutors. However, in most parts of the world, pandemic pedagogies did not use robust and rigorously planned learning solutions; instead, circumstantial support systems were hastily prepared, intended as last resorts to provide temporary access to materials, instructions and enable interaction (Cabrales et al., 2020; Ordorika, 2020). Considering this, the global education system was not prepared for the disruptive transformation demanded by ICT-mediated learning and quality assurance in this

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modality (UNESCO-IESALC, 2020), which has also been reported in nursing education (Christoffers et al., 2019; El Hussein et al., 2023; Evans et al., 2023).

In addition, systematic reviews to identify effective strategies for nursing education, performed during the pandemic, revealed that most studies proclaiming the effectiveness of distance education for cognitive, practical, and affective learning had mixed evidence and high potential for bias (Hao et al., 2022). Above all, practical education was particularly disrupted by virtual modalities, as documented in a scoping review (El Hussein et al., 2023). Furthermore, during the pandemic, nursing students experienced negative affective learning, mostly in the form of mental health problems and stress, as well as low motivation to learn (Mulyadi et al., 2021; Naciri et al., 2021). These limitations on cognitive, practical, and affective learning may be why meta-analyses and meta-reviews have found moderate to low levels of satisfaction with virtual education during the pandemic (Tabatabaeichehr et al., 2022), which may also explain why nurse educators perceived less effectiveness in nursing education than before the pandemic (Riess et al., 2023).

For instance, Latin American learning environments did not fully facilitate learning and interaction. A percentage of professors limited themselves to transferring on-site classes to an excessive use of videoconferences, without considering the amount of information and activities they assigned to their students (Cabero-Almenara, 2020). In addition, many professors were not technologically equipped to work from home (Ribeiro et al., 2020). Moreover, classes took place in the context of household distractions, very different from the environment of university classrooms and libraries (Ulloa Brenes, 2021). Evidently, Latin American students and educators face challenges similar like those found worldwide.

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Nonetheless, after the pandemic, distance modalities will still be a common way of teaching courses in nursing education in Latin America (Cabero-Almenara & Valencia, 2020).

Assessing the implications of the pandemic pedagogy experience for both nursing students and educators is pivotal before Latin American higher education institutions move forward with virtual and hybrid learning modalities in a post-pandemic world. We asked two general research questions: a) RQ1: What were the levels of stressors experienced by nursing students and educators during the pandemic pedagogy? b) RQ2: What was the narrative articulated by nursing curriculum designers regarding curricular management support guidelines during the pandemic pedagogy?

The findings of these research questions can then be used to answer an integrative research question: a) RQ3: As nursing education emerges from the pandemic pedagogy, what guidelines emerge for the robust implementation of virtual and hybrid modalities for nursing education in higher education institutions in Latin America?

**Materials and Methods.** A concurrent mixed-method design was used. The parallel-convergent typology QUAN + QUAL proved useful, as the quantitative and qualitative lines of research conducted independently, and their results were combined in the overall interpretation (Schoonenboom & Johnson, 2017). The study and its procedures were registered in the Research Office at the Pontifical Catholic University of Ecuador under code number (RO) 099-UIO-2021. The principal researcher received authorization by nursing career coordinators at six higher education institutions in Ecuador to request nursing students' and nursing educators' participation in the study. All participants in both the quantitative and the qualitative arm of the study provided written informed consent to participate. Participation in the quantitative arm was

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anonymous, with no possibility of identification, and participation in the qualitative arm was confidential. All data were collected in October and November of 2021.

*Quantitative Phase:* This phase measured the impact of distance education by virtual means on nursing professors and students during the period of the COVID-19 health emergency. Data was collected through a self-administered electronic form, sent through social networks associated with the nursing programs. The form included a message informing potential participants about the study, including a message regarding the objective of the study, the level of confidentiality offered, and conditions of use of the data.

*Participants.* The sample consisted of 115 nursing educators and 606 nursing students from six public and private higher education institutions nationwide. To be eligible for the study, nursing educators needed to be a nursing professor in a Higher Education Institution and have participated in curricular processes in university instructions involving a hybrid or virtual modality. Students needed to be over 18 years of age, be a university student in the nursing program, have experience taking nursing classes in online modality during the pandemic, and be willing to participate in the study. All nursing students and educators at the six institutions were invited to participate, but the final sample was non-probabilistic, as it was based on willingness to participate in filling out the survey.

Participants in the professor group ranged from 25 to 65 years of age (mean = 46.3, S.D. = 46.3). Most professors were females (n = 102, 88.7%); the rest were male (n = 13, 11.3%). Most professors (n = 97, 84.3%) had a master's degree with the remainder having a doctorate degree (n = 10, 8.7%) or postdoctoral education (n = 8, 7.0%). The students' ages ranged from 17 to 44 (mean = 22.2, S.D. = 3.7). Most students (n = 518, 85.5%) were female; the rest

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were male ( $n = 88$ , 14.5% ). Most students were studying at a private university ( $n = 485$ , 80.0%), while the rest were at a public university ( $n = 121$ , 20.0%).

*Measures.* To answer the research question and objectives, two questionnaires were developed. The first questionnaire was applied to nursing educators. It consisted of 14 items referring to technological management stressors, organizational management, attention to students and impact on quality of life. All items were scored on a Likert scale from 1 “Strongly disagree” to 5 “Strongly agree”. Internal consistency was assessed through Cronbach’s alpha, using SPSS v25.0. This measure had high internal consistency ( $\alpha = 0.90$ ). Structural equation modeling (SEM) employing maximum likelihood estimation techniques was used to assess the fit of the measurement model. A confirmatory factor analysis (CFA) was carried out using lavaan package in R to assess the adequacy of the proposed four-dimensional model. Although the measurement model had a significant  $\chi^2$  value ( $\chi^2 (48, 115) = 136.955$ ,  $p < .001$ ), the  $\chi^2$  is a poor measure of fit with large sample sizes. To assess a possible model, Hu & Bentler (1998, 2009) recommend a Comparative Fit Index (CFI) approaching 0.95 or higher, a Tucker-Lewis Index (TLI) approaching 0.95 or higher) a Standardized Root Mean Square Residual (SRMR) approaching 0.08 or lower, a Root Mean Square Error of Approximation (RMSEA) approaching 0.06 or lower. Further, they recommend that either the CFI or TLI and either the SRMR or RMSEA exceed the specified threshold. The measure of nursing educator experiences had good fit (CFI = 0.977; TLI = 0.969; SRMR = 0.032; RMSEA = 0.070 [0.057-0.084]).

The second instrument was applied to nursing students. This measure included 13 items referring to general fatigue, class boredom, time demands of assignments and passive

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learning. The response options were measured with a Likert scale from 1 (“Strongly Disagree”) to 7 (“Strongly Agree”). This measure had high internal consistency ( $\alpha = 0.95$ ). SEM employing MLE under the lavaan CFA package was used to assess the fit of the measurement model. Similarly, to the nursing educators’ model, the measurement model for nursing students had a significant  $\chi^2$  value ( $\chi^2 (48, 115) = 80.453, p = 0.002$ ). Using the more robust fit indices, however, the measurement of nursing students’ experiences had good fit (CFI = 0.986; TLI = 0.981; SRMR = 0.032; RMSEA = .055 [.033 - .076]).

*Qualitative Phase.* A semi-structured interview was conducted with eight key informants to investigate in depth their experiences with the implementation of the virtual modality contingent on the pandemic. Nursing curriculum managers were included to delve into participants’ thoughts, opinions and feelings about the advantages, disadvantages and institutional challenges that will make the most of on-line education. To be eligible to be interviewed, participants needed to be university professors in management positions with experience in distance learning curricula for nursing and hold an additional degree in teaching or pedagogy at the bachelor’s, master’s, or doctoral level.

Participants were chosen by convenience sampling. Participants were first informed about the voluntary nature of the study, the confidentiality of their participation, and the handling of information for privacy protection. After providing informed consent, a common interview guide was used with each participant. Generally, the interview addressed opportunities and challenges in online education experienced during the pandemic, institutional obstacles to adapting to the pandemic, instructors’ responses to virtual models, and recommendation for future management and implementation of distance modalities.

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The semi-structured interviews were conducted using recorded Zoom meetings. Interviews lasted between 20 and 62 minutes, with an average duration of 38 minutes. The recordings were then transcribed into a Word document for analysis, then, participants validated the transcripts of their interviews. The transcripts were sent to each key informant's e-mail address by the principal researcher, and participants could amend the transcript as they saw fit. Theoretical saturation was reached when the obtained interviews did not lead to further information related to the research questions or did not add novelty to the interview analyses. Inductive analysis was chosen for the interpretation and codification of the information. The verbatim transcripts were organized with ATLAS.ti version 8.4 software, used mainly for locating citations and notes, as well as for the creation of analytical categories and structural networks. One member of the research group individually started precoding. Then, the rest of the members modified, expanded, and incorporated the emerging categories until reaching a consensus in the triangulation process and the final structure of the categories emerged. Conceptual maps were produced to show the relationship of sub-themes to each emergent theme from the analysis.

*Mixed Phase.* After evaluating each source of data separately according to their respective methodological paradigms, the findings were integrated to complement the analysis of the studied phenomenon. Data and investigator triangulation were the validation strategies. This approach allowed the identification of meta-inferences to inform future online delivery of nursing education.

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## Results

*Quantitative Phase:* This phase aimed to find the levels of stressors experienced by nursing students and nursing educators during pandemic pedagogy. Frequency statistics were used to characterize levels of stressors experienced by nursing educators and nursing students during online pandemic pedagogy. Respondents were grouped into three equal sized bands or tertiles (33rd and 67th percentile) according to their stressors scores. For teaching stressors experienced by nursing educators, scores of 1 to 1.65 were considered low, 1.66 to 3.33 medium, and 3.34 to 5 high. For nursing student stressors, scores from 1 to 2.37 were considered low, 2.38 to 4.68 medium, and 4.69 to 7 high.

The nursing educators group showed high and medium scores on all dimensions (see Table 1). Most nursing educators reported high levels of stress related to student assistance and organizational management in the virtual modality. On all dimensions, including technological management and impact on quality of life, the stressors were experienced at medium or high levels for almost all the professors.

**Table 1.** Stressors related to teaching in the virtual modality (n= 115, range 1-5)

Dimensions	High 3.34-5.00		Medium 1.66-3.33		Low 1.00-1.65	
	n	%	n	%	n	%
	Technology Management Stressors	46	40,00	64	55,65	5
Organizational Management Stressors	55	47,83	51	44,35	9	7,83
Student Management Stressors	82	71,30	30	26,09	3	2,61
Impact on quality of life	50	43,48	57	49,57	8	6,96

Source: Questionnaire applied to teachers, 2021.

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Nursing students also scored high on all four indicators of stress due to the virtual modality (see Table 2). Most students reported physical fatigue, passivity in interaction, exhaustion due to the assignment of tasks, and boredom in class (See Table 2). Nearly all students reported high or medium levels of these indicators.

**Table 2.** Exhaustion related to virtual mode learning (n=606, range 1-7)

Dimensions	High		Medium		Low	
	4.69-7.00		2.38-4.68		1.00-2.37	
	n	%	n	%	n	%
General Physical Fatigue	410	67,66	156	25,74	40	6,60
Classroom Boredom	304	50,17	224	36,96	78	12,87
Exhaustion due to task assignments	376	62,05	175	28,88	55	9,08
Passivity in interaction	394	65,02	171	28,22	41	6,77

Source: Questionnaire applied to students, 2021

These results demonstrate that nursing educators and nursing students were exposed to a wide range of stressors during the pandemic pedagogies.

*Qualitative Phase.* Was designed to explore the narrative articulated by nursing curriculum designers regarding curricular management support guidelines during pandemic pedagogy. Three major themes emerged in the collective narrative: (A) traces of pandemic pedagogy; (B) administrative management of the hybrid mode; and (C) pedagogic management of the hybrid

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modality. Within each theme, codes emerged. These themes with codes are displayed in a concept map that shows their fit in a structural network.

*Traces of pandemic pedagogy.* This theme revealed impressions and feelings from key informants about how the massive transition from in person to online education during the COVID-19 pandemic continued to manifest after the initial shift. This category reveals an important issue about the stressful, highly demanding, and even frustrating experience of educators and students during the transition from classroom to online education. Past experiences with distance education influenced the pedagogies that were incorporated but did not guarantee effective implementation. Lack of clear institutional guidelines and insufficient preparation of some faculty contributed to the dysfunctional implementation of online education. Nevertheless, professors were able to learn for the future, perceive the advantages of the new modality and identify the institutionalization of suitable processes, which in addition to regulating the academic and administrative dimensions, consider the human condition of the student and the educator. This theme consisted of six codes: previous development of online education; teaching stress; student stress; potential benefits, institutional risks and lessons learned (see Figure 1).

The previous development code showed that past experiences with distance education programs influenced pandemic pedagogies but was not a guarantee to the practical implementation of the virtual modality. Representative statement includes: “when virtuality was declared ... universities did not know how to carry out these (academic-administrative) processes, ... there were no clear guidelines” (P3); “Some professors were not fully prepared

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for this, and the courses were set up in a haphazard manner” (P4); “professors started to work virtually without any preparation” (P5).

The teaching stress code was comprised of the emotional or physical tension among nursing educators perceived by key informants. For example, key informants reported: “Frustration in professors who were not used to this process” (P2); “Academic time carried into the home and (there) these times had a different nuance” (P5); “Professors were very uneasy when a student did not turn on their camera” (P1).

The student stress code included emotional or physical tensions perceived among nursing students. Examples include: “They do not have good access to the Internet” (P1); “Some professors extended their classes for 3 or 5 hours ... and the students eventually got tired” (P3); “There was a lot of autonomous work... and this caused students to be unconvinced that the virtual modality was appropriate” (P8).

The perceived benefits code described advantages to professors that the key informants perceived. Such benefits included: “Making better use of synchronous time” (P2); “(Being able to) connect from anywhere and ... promote much more international exchange” (P8); “The virtual modality improved creativity” (P3); “Encourages autonomous and collaborative learning” (p 9).

The institutional risks code included systemic failures to respond to the burdens of pandemic pedagogy. Key informants claimed that: “Deeply human dimension can be lost” (P1); “We do not establish boundaries between personal life and work” (P1).

The lessons learned code reflected outcomes of the experience that participants felt would guide future online education. These included learning: “Trying to migrate the face-to-face

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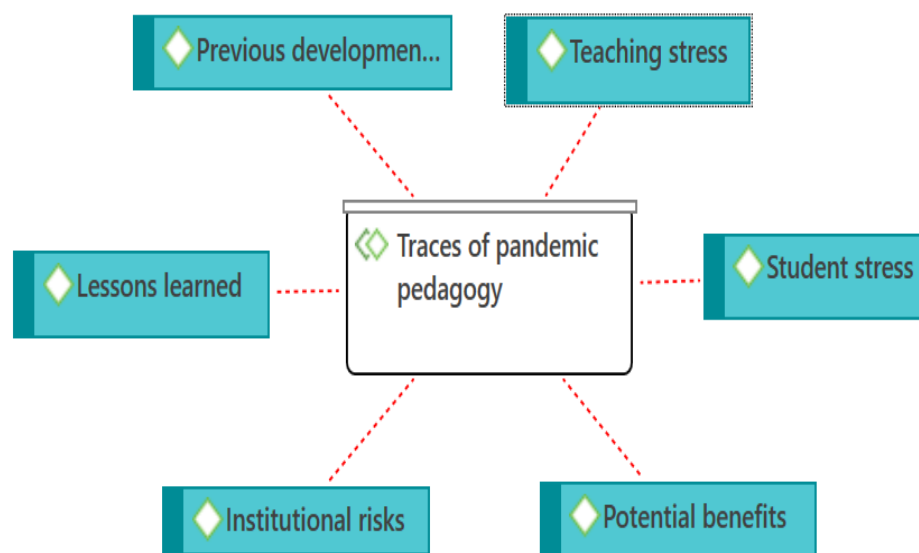
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concept to virtuality is a mistake" (P1); "Distance education does not solve problems of overcrowding and should not be used to increase the workload on professors" (P9); "It is necessary to have an academic unit to supervise and support the institutional processes in the evaluation of distance learning, and to help professors in the production of resources so that these processes do not become barriers to the implementation of the modality" (P9).



**Figure 1.** Traces of pandemic pedagogy: emerging codes

*Administrative management of the hybrid modality.* This theme was constituted of perceptions from key informants about ways to improve administrative management of educative processes. The informants offered three codes reflecting administrative needs: administrative agility; evaluation and follow-up; and appreciation for the human dimension (see Figure 2).

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The administrative agility code reflected the need to reduce the multilayered systems and processes in favor of more efficient practices. The informants reported: “Multiply the channels of dialogue to work from the micro-curriculum, work on the instructional program, collaboratively build methodologies, and evaluate processes and methodological strategies” (P4); “Promote working meetings to articulate the didactics and (...) the assignments and student products, according to the hours they have available and the competences they must achieve” (P4); “To promote discussion among professors to define topics for the virtual and face-to-face format” (P5)

The evaluation and follow-up code reflects continuous improvement processes as important aspects of any education system. In calling for evaluation and follow-up, participants said: “To have a team to monitor and evaluate (...) in order to detect in time what needs to be strengthened” (P5); “Research how the professors feel about this process” (P2); “Generate discussions on the convenience or not of an entirely virtual modality” (P9); “Review how technology-mediated education modalities are being inserted” (P9).

Approaching the human dimension of the professor code reflected key informants’ beliefs about behaviors that enhance professors’ relationships and performance in the workplace. These beliefs included: “The empathy of the academic coordinator is highly necessary... empathy with the professor” (P2); “That the professor be able to approach the academic coordinator (...) without fear of being disciplined” (P2).

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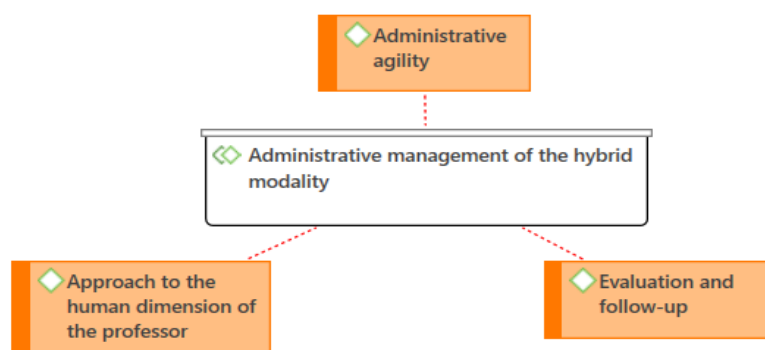
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**Figure 2.** Administrative management of the hybrid modality: emerging codes

*Pedagogical management of the hybrid modality.* This theme was comprised of key informants' suggestions for the in-class implementation of hybrid modalities by individual instructors. This theme included five codes: appropriate instructional planning for the modality; didactics; professor training; humane requirements; and allocation of teaching time (See figure 3).

The appropriate instructional planning for the modality code reflected the broad idea that different teaching modalities have different pedagogical requirements. For example, the key informants expressed: "Taking into account that it is not a matter of transferring the face-to-face classes to a virtual environment, but rather of developing a planning (...) that ensures an active and meaningful learning process" (P4); "It is important to have well-defined criteria to be able to organize the courses and the modality of each one, which demands that laboratory work, professional internship, and community work must be implemented face-to-face, but the other components of these same courses can be learned in virtual modality" (P9).

The didactics code consisted of claims that, at the micro-curricular/class session level, teaching strategies needed to be adapted to the modality. These included needs to: "cleanse the

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curricula of subjects that do not contribute” (P5); “develop realistic syllabi, with concrete learning outcomes” (P8); “Plan autonomous works according to the students' time frames” (P8); “Assign only those homework assignments that serve to achieve the learning outcomes” (P8). The professor training code included needs to assist nursing educators and nursing students on the connection between teaching strategies and academic content. The key informants described: “training in new pedagogical trends” (...) “training in blended teaching (...) that will enable professors to adequately handle both scenarios” (P9); “Teaching should be focused on creating the conditions for contextualized, experiential, reflective learning that leads to action” (P1); “Professors should confront students with reality, even if that reality is dysfunctional ... the student must learn in uncertainty so that he learns autonomy, decision making and self-evaluation” (P5); “The virtual component of the hybrid modality should not be used to promote the memorization of contents, but to solve problems, to propose new ways of dealing with real-life situations” (P7).

The humanistic requirements code accounted for affective learning needs in hybrid environments. Topics in this code addressed adapting to students' needs during the educational activity. The mentioned requirements were: “The human conception of education (...) makes us put ourselves in the place of students” (P5); “When we acknowledge that our encounter with the other is an opportunity to grow (...) we are not thinking about overloading students with homework, but rather that homework allows them to learn and become better each time” (P4); “(...) It is to live the learning experience through reflection (...) learning that they can be valued beyond grades” (P1); “Students need emotional support to move forward,

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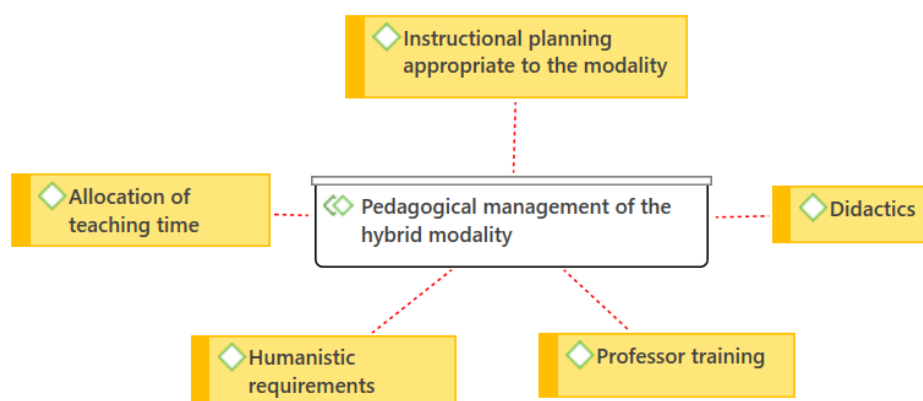


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and the professors must be prepared to assume that role” (...) “Students should learn with love, which is the way they can learn to be more human” (P5).

Finally, the allocation of teaching time code reveals that time must be managed. Key informants acknowledged educators need: “Time allotted in their schedule to get to know their students, reach out to them, genuinely care about and support them” (P5); “More time to prepare the instructional experience (...) to design new tools” (P2); “That the excessive workload given to professors must be incorporated into the discussion” (P4).



**Figure 3.** Pedagogical management of the hybrid modality: emerging codes

*Mixed Phase.* After completing the analysis of the quantitative and qualitative data, the two sets of results were compared to examine contradictory, convergent, or additional information that would expand the understanding of the findings. The meta-inferences address the prevalence of both stress in professors and exhaustion in students (quantitative approach) and the perceptions of key informants (qualitative approach). The integrative analysis allows this experience of pandemic pedagogy to inform teaching in the post-pandemic phase, and to





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address the third research question by offering guidelines for robust implementation of virtual and hybrid modalities for nursing education in higher education institutions in Latin America. Three guidelines emerged: acknowledge that pandemic pedagogy was a necessary but inadequate response; admit that a learning crisis was revealed; and take advantage of the opportunity to rebuild.

The first meta-inference was that pandemic pedagogy must be acknowledged as an inadequate response to the teaching-learning process in virtual environments. The pandemic was an unexpected situation that led to the implementation of emergency training programs to improve educators' skills during the confinement period. Overnight, nursing educators were asked to demonstrate didactic preparation, manage disruptive mediations, curate content, integrate innovative tools, organize virtual infrastructures, and apply motivational strategies to maintain attention and develop self-regulation among students (Cabero-Almenara & Barroso-Osuna, 2015). At the same time, curriculum designers, as reflected in our data, admitted that the administrative, training, and humane support for these activities was insufficient. Nursing educators who participated in this study experienced a great deal of stress due to the amount of work that the virtual modality represented. Our data indicates that students were burnt out as well. The inadequate response reflects limited time available to meet the demands, increased administrative demands and bureaucratic procedures, and demotivation among nursing instructors and nursing students. As we move from pandemic pedagogy to future virtual and hybrid modalities, we must not simply carry forward the tools that were developed during the pandemic as they are inadequate tools for professors and learners.

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The second meta-inference is that we must admit that we are in a learning crisis. This crisis includes both the experiences of nursing students and nursing educators and the opinions of educational experts. Although there may have been cognitive learning, students' affective learning appears poorly supported by the infrastructure of online learning. While we are using technologies to provide content, the social and cognitive aspects of learning, as well as the presence of the professor for interaction and collaboration, must be spathy, trust, humanization and proximity with colleagues and the facilitator are to be supported (de Aguinaga Vázquez et al., 2009). These aspects of learning are not currently supported. Remediation of this crisis requires professors to reengage didactic planning and the design of activities and resources, but also that professors be supported in having time and coached to create personalized virtual assistance for students, anticipate student needs, and respond continuously and in a timely manner to their concerns. Likewise, institutional support for professors in this crisis is required, including allocating time for programming, training instructors in the modality, and providing flexibility in professors evaluation processes.

The third meta-inference is that we must collectively take advantage of opportunities to rebuild. We cannot continue pandemic pedagogy into the present, and we cannot merely revert to pre-pandemic teaching. Instead, we must build on the strengths gained in the pandemic period and overcome the limitations identified in pre-pandemic and within-pandemic pedagogy. In this rebuilding, main commitments include adequation of technical assistance, improvement of technological infrastructure, higher investment in training for nursing educators, and a realistic allocation of time for technological, organizational and student management. In particular, the curricular planning aspects are of foremost importance for the adequate

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structuring of specific nursing knowledge, managing of time and resources, and scheduling time for the autonomous activities that lead to the nursing students' practical and attitudinal formation. Careful consideration of these aspects undoubtedly expands the opportunities for professors and students to share life, work, and educational experiences as part of the teaching-learning process.

## Discussion

This study assessed the impact of pandemic pedagogy on professors and students to identify ways that virtual and hybrid modalities for nursing education in higher education institutions in Latin America can be improved. Our findings are consistent with existing evidence after COVID-19. Students, professors, and curriculum managers revealed that most informants experienced stress, negative impact on quality of life, difficulties in promoting participation, absence of adequate technological infrastructures to facilitate learning, designation of a large group of online students and the excess of activities assigned to nursing students during the implementation of pandemic pedagogies. Our results reflect broader trends where professors and students perceived stress during the change from face-to-face to virtual classes (Casali & Torres, 2021; Núñez-Canal et al., 2022; Kidd & Murray, 2020).

Understanding learning experiences during pandemic pedagogies from the view of participants entails new forms and procedures for teaching practice to ensure the quality of learning (UNESCO-IESALC, 2020). Our findings indicate that virtual and hybrid modalities must move towards a flexible, dialogical, personalized teaching model with less transactional distance (Medina-Maldonado et al., 2020; Ramos-Morcillo et al., 2020; Shearer & Park, 2019). Post-pandemic pedagogy should demonstrate a consistent application of a more collaborative

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and student-centered philosophy, a conception that requires innovation in the teaching-learning process (Cabero-Almenara, 2020; Cabero-Almenara & Barroso-Osuna, 2015), in the development of authentic tasks to promote a multidirectional pedagogical dialogue (Núñez-Canal et al., 2022), and in providing permanent feedback to students (Copado Rodríguez & Osorio Madrid, 2021).

A common concept across both sets of findings (QUANT + QUAL) was the implementation of active learning methodologies to teach subjects related to nursing theory or nursing practice. Best responses to these findings include narrative, theory-guided pedagogical approaches to support a sense of closeness between students and teachers (Christopher et al., 2020). The recommendations made by our participants are similar to those found in other contexts: effective distance learning programs should provide sufficient flexibility to enable students to participate in coursework and research at their convenience, but also be interactive, stimulate learning, improve learning outcomes and critical thinking, and enhance student experience merging the effective and tech-friendly pedagogical methods (Bumblauskas & Vyas, 2021). Our participants suggested multiple ways to raise the quality of interactions between students and professors to strengthen high quality and highly motivational creative and innovative learning that motivates students (Copado Rodríguez & Osorio Madrid, 2021; Casero Béjar & Sánchez Vera, 2022).

Consistent with previous literature, we found that comfort with technology and support in terms of training and time management created stronger feelings of self-efficacy and satisfaction (Hampton et al., 2020) (Dolighan & Owen, 2021). In addition, our findings were consistent with previous research showing that e-learning was perceived by many nurse

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educators as an opportunity to improve informatic competencies, technological skills and instructional innovation (Chang et al., 2022; Haslam, 2021; Tolyat et al., 2022). Our research, however, extends those findings since we found that virtual and hybrid nursing education requires administrative management considerations, not just changes in the individual educator. In virtual environments, teaching is not simply moving class hours and synchronous tutoring online; instead, administrators must recognize that effective online professors spend additional time on internal messaging in the online classrooms and more time addressing student concerns and challenges than in the physical classroom, and these challenges increase within an environment characterized by inequalities in the use of technologies. To ensure high-quality education and the achievement of learning outcomes, administrators must invest in training for nursing educators and realistically allocate time for technological, organizational and student management.

This study has some limitations. The participant selection, based on convenience, does not allow a generalization of these results. Even though convergences among data sets from quantitative and qualitative perspective were found, the use of different units of analysis gave difficulties in the triangulation during integrative data process. Future studies may wish to inquire about the use of technological tools and informatic skills gained by faculties or students in the post-pandemic period and their applications in nursing practice or education.

## Conclusions

Inadequate planning, and the lack of technological support and teaching skills, generated stress, overwork, and exhaustion in nursing professors and students. A change of educational

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modality must be preceded by a carefully planned transition of teaching methodologies, allowing teachers and students to successfully adapt to the new modality.

The transition from face-to-face to virtual education requires a micro-curricular adaptation, including a review of the ratio between the hours of virtual classes in real time and in the homework assigned to students. In addition, active learning methodologies are recommended, such that involve students in challenges or integrative projects of several courses, which would favor motivation for learning, interdisciplinarity and a more efficient use of the time assigned to autonomous work.

The implementation of the hybrid modality requires adequate pedagogical and administrative management. A student-centered philosophy is needed to strengthen the principles of humanistic education. Empathizing with students will improve affective learning, while helping them to enjoy the learning experience, in a manner that the contact with the professor and their peers is full of reflection, construction, interaction and emotion. Moreover, academic management teams should analyze vertical and horizontal curricular coherence, so that the tasks assigned to students generate active, interdisciplinary, meaningful, and contextualized learning processes to improve cognitive and practical learning.

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