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TEACHING ONLINE: LESSONS LEARNED ABOUT METHODOLOGICAL STRATEGIES IN POSTGRADUATE STUDIES

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Article

Teaching Online: Lessons Learned about Methodological Strategies in Postgraduate Studies

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Abstract: The objective of the present study was to analyze the methodological strategies used by postgraduate faculty from four international education faculties during the transition from face-to-face classes to virtual ones. Through the use of a mixed methodology, a questionnaire with Likert-type, multiple, alternative, and open-ended responses was designed. The results showed that during the transition from face-to-face to virtual classes, the most-utilized teaching activities were collaborative work, followed by lectures through videoconferences. Almost all the faculty modified their instruction methods, highlighting teaching activities, followed by evaluation activities. The study concludes by pointing out the lessons learned during the transition from face-to-face teaching to virtual teaching. We believe that universities must take advantage of the push towards virtual teaching made possible by the pandemic, to continue opting for the new technologies in Higher Education to face future emergency situations with resilience.

Keywords: virtual classrooms; teaching methods; online learning; quality of teaching; crisis intervention

1. Introduction

The coronavirus pandemic incentivized the integration of technologies in education processes. The physical closure of universities created a need to virtualize the teaching tasks of faculty, as well as the learning of the students. The practice of teaching was performed through synchronous or real-time activities, such as videoconference or video calling platforms, and asynchronous or flexible schedules, through virtual learning environments. Given the gradual return to normality, partial or semi face-to-face strategies have been established, as well as hybrid or ubiquitous learning, combining face-to-face with virtual strategies [1,2].

This sudden reliance on technology during the confinement guaranteed the continuity of education processes through remote or emergent learning [3], and tele-education [4,5].

A change in the role of the instructor is observed when changes are made from face-to-face to virtual education [6]. The virtualization of teaching implies the scheduling of learning, the development of digital teaching competencies [7], university training in education technology [8], and an improvement in the management of information and communication through virtual environments. At the same time, some innovative methodologies are re-implemented, which allow for establishing flipped classroom processes [9].

As for the learning of the students, greater autonomy and empowerment of the learning of the students is perceived. Furthermore, collaborative learning also rises as an alternative to co-learning through virtual learning communities [10]. At the same time, learning through technology promotes situated, personalized, and invisible learning [11].

During the period of movement restriction and confinement, many universities transitioned their postgraduate offerings from a face-to-face modality to a virtual one (e-learning). Nevertheless, this process of transformation did not guarantee quality education that prioritizes the instructional designs of virtual classrooms by a professor together with a tutorship, but it was more similar to remote education [3]. In fact, the virtualization of teaching revolved around virtual classes through videoconference tools, which is more similar to a hybrid education model [12], or remote education [13,14].

Likewise, due to the effects of the COVID-19 pandemic, universities had to re-design their education proposals to a virtual format, but hybrid education alternatives based on the transmission of knowledge and face-to-face learning were observed [15,16].

The present study is novel, as it is based on an international comparison of the strategic methodologies adapted by postgraduate faculty from different areas and disciplines in four universities (one in Europe, and three in Latin America), with respect to teaching virtual classes due to COVID-19.

2. Face-to-Face Strategic Methodologies

A strategic methodology, according to [17] comprises a set of procedures and techniques whose use is fundamental for the teaching-learning process, in order to promote significant learning. Authors such as [18] point out that these are procedures that teachers use in a flexible and reflective manner to motivate significant learning by students with the necessary resources for teaching.

The methodological practices correspond to various approaches, which at the same time utilize digital channels and applications during their implementation [19], and which are combined with each other online and in face-to-face situations. Some of these strategies have been frequently utilized during online teaching, but their origin comes from face-to-face modalities.

The transition to a virtual modality involved the adoption of new methodological strategies, in which the use of technological tools such as Information and Communication Technologies (ICT) proved to be essential. Aside from a greater workload for the planning of content and teaching activities, it also implied a change in quality, given the increased interest of instructors to add these tools to their practice of teaching, while at the same time having to address the exceptional situation during the period of confinement [15,16].

3. Strategies and Learning in Virtual Environments

Learning in virtual environments is based on four catalyzing elements: (a) connectivity, nurtured by the interaction in social networks; (b) the empowerment of the students when making decisions with respect to their own learning; (c) overcoming the limitations of time and space, as the students decide when and where to learn; and (d) the inclusion of invisible learning that cannot be perceived easily, although it allows for the acquisition of fundamental competencies [20]. On the other hand, there is a classification of ICT resources commonly used by university teachers, taking into account the type of resource and tools [21].

- Meetings and tutorials (resource type: communication): Skype, Google Meet, Blackboard, Zoom, etc.
- Sharing content (resource type: repository, social networking, cloud storage, social bookmarking, multimedia resources): Slideshare, Twitter, Dropbox, Delicious, webinars, etc.
- Assessment (resource type: assessment): Google Forms, Kahoot, EdPuzzle, Mentimeter, etc.
- Lessons (type of resource: presentations/dynamisation tools): PowerPoint, Genially, Canva, etc.

According to [22], the characterization of virtual environments is a process under construction; it essentially implies that what the student learns in a virtual environment does not have to be a reproduction of what is presented as content in this environment, but

a re-working of this content as a function of, and starting from, a broad set of elements that shape the cognitive structure of the learner: basic cognitive capacities, specific knowledge of the domain, learning strategies, metacognitive and self-regulation capacities, affective factors, motivations and goals, mutual representations and expectations.

As for quality teaching in higher education, many studies have mentioned its complexity due to its controversial nature [23]. Quality teaching can be considered as the process of learning that leads to extraordinary learning in the personal and intellectual training of the student [24,25]. On the other hand, this concept is associated with accreditation processes in higher learning, related to the constant evaluation of the pertinence of the programs and curricula, the design of effective instructional strategies, competent teachers and competencies, and an infrastructure that allows reaching academic goals, among others [26].

In fact, the virtualization of teaching has provided an opportunity to improve quality through integration. However, [27] found that during the pandemic, the virtualization of teaching was perceived as having a low quality, precisely due to the lack of interaction between students and teachers, given the dependency created in the physical classroom. At the same time, it challenged the teachers with a greater role as a tutor and companion [28].

Other authors such as [29] associate the "virtual environments" with a computer application or software that uses the internet as a means of communication with students, and which allows immediate access to diverse materials and resources, facilitates collaborative work, interaction, accreditation, flexibility, standardization, scalability, and ubiquity. Virtual spaces are the means for better development of teaching and learning processes [29,30], as before the pandemic, they were utilized as a complement to face-to-face education, as they promoted the development of interpersonal skills and facilitated the monitoring of learning, aside from being a mechanism of motivation and evaluation. They have greatly contributed to the sustainability of teaching and learning activities during confinement.

The reopening of universities for face-to-face instruction after the enforced period of virtual learning provides an optimal opportunity to reflect on lessons learned during the pandemic and its implications for future instruction. The present study capitalizes on an international research network to examine how postgraduate education faculty in a variety of institutional and social contexts responded to the virtualization of instruction and learning, and how these experiences may shape future instructional decisions.

The research questions posed are the following: What were the most common instructional adaptation strategies during the pandemic for the postgraduate faculty in the study? Based on faculty assessments of the efficacy of strategies employed, which will be maintained in the future?

4. Materials and Methods

4.1. Objectives

The study objectives are:

- To analyze the instruction strategies utilized by postgraduate professors from four education faculties during the transition from face-to-face classes to virtual environments.
- Identify the teaching activities that will continue to be used (lessons learned) in the education faculties from the four different international contexts.

4.2. Methods

The present study utilized a mixed methodology, comparing qualitative and quantitative data [31].

An ad hoc questionnaire was constructed with qualitative and quantitative variables to delve into aspects associated with the instruction strategies utilized in postgraduate studies at education faculties. The present study was conducted given the unprecedented situation of confinement, as it made possible the analysis of different universities with respect to the instruction strategies utilized to transition the face-to-face instruction to virtual environments.

The questionnaire was composed of a block which contained identification data (independent variables): age, years of teaching experience, sex, program or degree in which teaching was conducted, university, and type of university contract. Afterwards, 22 questions were provided which included questions that utilized a Likert scale (where 0 is nothing/null, and 4 indicated very much/always), questions with multiple and alternative responses, and open-ended questions. The items were grouped into 3 differentiated dimensions:

- Dimension 1: Instruction strategies utilized (11 items).
- Dimension 2: Evaluation (7 items).
- Dimension 3: Development of teaching: workload and emotional factors (4 items).

The present article will focus on the instruction strategies utilized (Dimension 1). The statistical treatment of the data allowed for a descriptive and inferential analysis of the variables. The statistical techniques and tests that were utilized for the quantitative part were:

- A description of the quantitative variables with frequency and percentage tables. To cross-analyze these variables, contingency tables were utilized.
- The quantitative variables were described with the common tools of centrality: mean and median; and variability: observed range, standard deviation, and interquartile range. The Kolmogorov–Smirnov goodness-of-fit test was utilized to verify the significance of the deviation with respect to normality.
- The reliability was assessed with Cronbach's Alpha internal consistency coefficient.
- The independent Chi-square test was used to verify the association between two categorical values.
- The effect size was calculated to express the magnitude of the differences between the samples. As the variables were categorical, R^2 was calculated with Cramer's V, which is similar to Pearson's coefficient, but more specific for this type of data.

To address the first objective of the study, to determine the range and frequency of strategies and activities that faculty used during the pandemic, we utilized quantitative findings. To address the second objective, to determine the activities that faculty deemed to be most (and least) successful and those that they would continue to use, we utilized open-ended (qualitative) responses. In just over half of the responses, the faculty stated in short phrases the strategies used; the remaining responses were lengthier, containing explanations of why the particular activity was successful or not. First cycle coding was completed using descriptive coding, with second cycle coding used to identify patterns, create categories and create a categorized inventory of responses [31]. Although [31] has criticized descriptive coding as insufficient for the coding of ethnographic interviews, it is appropriate for use with the survey data in the present study and to address the descriptive nature of the study objectives.

Thus, the hypotheses of the study are as follows:

Hypothesis 1 (H1). *The most used teaching actions are those related to the remodelling of face-to-face teaching.*

Hypothesis 2 (H2). *The teaching strategies used in the virtual world have led to a greater use of more active strategies.*

Hypothesis 3 (H3). *The sudden change to virtual teaching meant that teachers had to make many changes compared to face-to-face teaching.*

Hypothesis 4 (H4). *Emotional state directly influences the perception of online teaching quality.*

4.3. Sample

The informants were members of education faculties from 4 universities: the University of Lleida (Spain), the University of Tarapacá (Chile), the University of Tolima

(Colombia), and Simón Bolívar Andean University (Ecuador). The study population was composed of the faculty who taught postgraduate classes during the 2020–2021 academic year (confinement period). The sample was composed of 60% from the University of Lleida (*n* = 74), 22.4% from the University of Tolima (*n* = 71), 9.6% from the University of Tarapacá (*n* = 14), and 8% from the Simón Bolívar Andean University, Ecuador campus (*n* = 10). All the participating universities were public, and specifically, they had:

- Simón Bolívar Andean University, Ecuador campus: 26 postgraduate programs with about 2500 enrolled.
- University of Lleida: 52 postgraduate programs, with about 2400 students.
- University of Tarapacá: 9 postgraduate programs, with about 1223 students.
- University of Tolima: 4 postgraduate programs, with a total of 2000 students.

A randomized probabilistic sampling was performed, with a confidence level of 95%, and a margin of error of ±5% and a maximum variance of P = Q = 50%. An N of 125 informants was obtained, thus meeting the sampling conditions.

The sample was characterized by faculty with a mean age between 41 and 50 years old. Most were women (60%, in all the universities); they were the majority, except for the University of Tarapacá. Furthermore, 52% of the participant faculty were hired full-time, highlighting in this sense, the 3 Latin American universities.

4.4. Validity and Reliability of the Questionnaire

First, content validity was analyzed through the expert judgement technique, utilizing the criteria of relevance, univocity, and degree of importance in each of the items. Afterwards, the reliability was validated, considering that the questionnaire was composed of 11 close-ended questions with a total of 62 resulting variables. From there, the degree of reliability of the participants was calculated using Cronbach's alpha coefficient, obtaining a value of 0.67, which was considered good. Subsequently, the ordinal Cronbach's alpha value was calculated. The result was somewhat higher than the classical "alpha" coefficient calculated earlier. Its value is 0.75, so being >0.70 and <0.90 the reliability is considered good.

4.5. Procedure

The questionnaire was sent online to the sample object of study through professors from the different participating universities. Many reminders were sent in a period of three months (September–November, 2021). The participants were ensured of the protection of data and anonymity of the participants.

5. Results

5.1. Teaching Activities

In this first section, the teaching activities performed during the transition from face-to-face classes to virtual ones are analyzed.

The results showed that from the total sample, 80% of the faculty dedicated time to creating material, followed by searching for documents online (68.8%), and re-structuring the evaluations (63.2%).

After comparing the responses between the universities (Table 1), the most significant results indicated that:

- Creation of material. This was done in a similar manner in all the universities analyzed (*p* > 0.20).
- Search for documents online. This was done in a similar manner in all the centers (*p* > 0.20).
- Re-structuring of evaluations. This was less frequent at the Andean University (40%) as compared to the rest (between 62.7% and 71.4%), and although a statistical significance was not found (*p* > 0.20), the effect size (moderate level: 0.026) can be an indicator of a trend in this regard.

Table 1. Teaching activities performed during the transition of the face-to-face classes to a virtual format as a function of the University. *n* = 125 professors.

| Teaching Activities | TOTAL | University | | | | Chi-Square Test | | Effect Size R² |
		U.Lleida (*n* = 75)	U.Tarapacá (*n* = 12)	A.U.S.B. (*n* = 10)	U.Tolima (*n* = 28)	Value	*p*-Value	
Create materials	80.0%	82.7%	83.3%	70.0%	75.0%	1.48 N.S.	0.687	0.012
Search for documents online	68.8%	69.3%	75.0%	50.0%	71.4%	1.96 N.S.	0.580	0.016
Re-structure the evaluations	63.2%	62.7%	66.7%	40.0%	71.4%	3.20 N.S.	0.362	0.026

N.S. = Non-significant; Author created with IBM SPSS Statistics 25.

5.2. The Most Utilized Strategies in the Adaptation of Teaching

In this section of the questionnaire, the instructional strategies that were most utilized to adapt face-to-face teaching to virtual teaching were analyzed. A list of eight options was provided, and the informants had to mark the most significant ones.

In the descriptive analysis of the total sample of participants, it was observed that collaborative work was the most frequent (74.4%), very noticeably as compared to the rest. Frequently utilized strategies also included lectures through videoconferences (49.6%) and flipped classrooms (43.2%).

The comparison between universities showed that (Table 2):

- The flipped classroom was utilized similarly in all of them, except for Tarapacá, where it was utilized less, but without the differences being statistically significant ($p > 0.20$). Even then, a moderate-small (0.28) effect could point to a trend.
- Collaborative work was used in all four centers, but especially in Tarapacá (91.7%) and the Andean University (90%), as compared to Lleida, which utilized this strategy the least (66.7%). The difference was almost significant ($p < 0.10$), with a moderate effect size (0.051).
- Lecture class with videoconference. This was utilized in percentages that were very similar in all four centers, so that significant differences were not found ($p > 0.20$).

Table 2. Comparative analysis. Most used strategies in the adaptation of face-to-face to virtual teaching, depending on the university. *n* = 125 professors.

| Teaching Adaptation Strategy | TOTAL | University | | | | Chi-Square Test | | Effect Size R² |
		U.Lleida (*n* = 75)	U.Tarapacá (*n* = 12)	A.U.S.B. (*n* = 10)	U.Tolima (*n* = 28)	Value	*p*-Value	
Case studies	36.0%	41.3%	8.3%	10.0%	42.9%	8.42 *	0.038	0.068
Flipped classroom	43.2%	49.3%	25.0%	40.0%	35.7%	3.45 N.S.	0.327	0.028
Project-based tasks	33.6%	22.7%	50.0%	40.0%	53.6%	10.65 *	0.014	0.085
Collaborative work	74.4%	66.7%	91.7%	90.0%	82.1%	6.39	0.094	0.051
Challenge-based tasks	26.4%	26.7%	8.3%	50.0%	25.0%	4.91 N.S.	0.178	0.039
Lectures (videoconferences)	49.6%	52.0%	41.7%	50.0%	46.4%	0.59 N.S.	0.899	0.005
Instruction among equals	14.4%	13.3%	16.7%	0.0%	21.4%	2.92 N.S.	0.404	0.023
Other strategies	13.6%	16.0%	16.7%	0.0%	10.7%	2.24 N.S.	0.525	0.018

N.S. = Non-significant; * = Significant; Author created with IBM SPSS Statistics 25.

From a descriptive perspective, it can be affirmed that in all of the centers, the most utilized strategy was collaborative work, between 66.7% and 91.7%, although differences were found in the use of the rest of the strategies (see Table 2).

5.3. Changes in the Teaching of the Classes

Among the tasks that were most modified to adapt the face-to-face postgraduate classes to a virtual format (Figure 1), the following stood out: the learning activities (77.6%),

evaluation activities (63.2%), and the hours of advising/tutoring with the students (60.8%). Only 2.4% did not change anything.
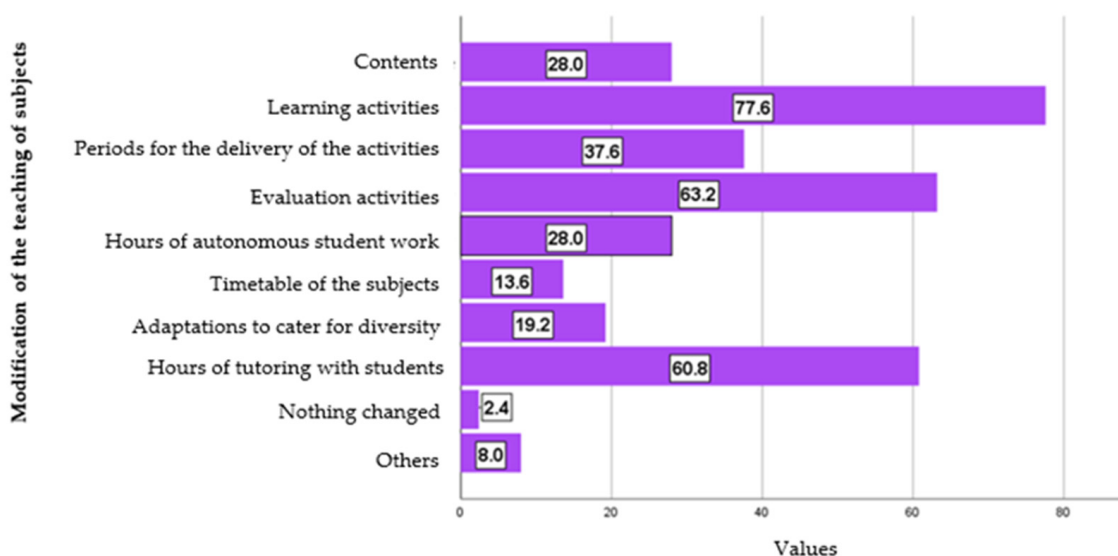

Figure 1. Modification of teaching of face-to-face classes to virtual ones. Scale out of 100.

The comparison of these changes between universities is summarized in Table 3. It was observed that although statistical significance was not found (all with $p > 0.05$), some p-values, along with effect sizes, were found that could indicate the existence of a differential trend. More specifically, in:

- Class schedules, in which the differences were almost significant ($p < 0.10$) and corresponded to a moderate effect (0.052). The data indicate that it was at the Andean University in which this change was implemented the most (40%), as compared with the rest of the universities (between 8.3% and 12%).
- The number of hours dedicated to the independent work of the student, with $p < 0.20$ and a moderate effect (0.049), in which the highest values were found at the University of Tarapacá (41.7%) and at the University of Tolima (42.9%), with smaller values found at the University of Lleida and the Andean University Simon Bolivar, Ecuador campus (21.3%) and (20%).
- Evaluation activities, with $p < 0.20$, and a moderate effect (0.047), where a lower rate was observed at the Andean University Simon Bolivar Ecuador campus (30%) as compared to the rest (between 58.3% and 71.4%).
- Hours of advising/tutoring with the students, with $p < 0.20$ and an even more moderate effect (0.041), where fewer changes were observed at the University of Tarapacá (41.7%) and the Andean University Simon Bolivar Ecuador campus (40%), as compared to the University of Lleida (62.7%) and the University of Tolima (71.4%).

The greatest changes were found at: (a) the University of Lleida—learning activities, advising/tutoring hours, and evaluation; (b) the University of Tarapacá—learning, periods for turning in of assignments, and evaluation; (c) Andean University Simon Bolivar Ecuador campus—learning activities; and (d) the University of Tolima—also learning, but followed closely by evaluation and student tutoring hours. Ultimately, all the universities made similar changes, although these specific aspects were modified depending on the peculiarities of each institution.

Table 3. Comparative analysis. Modifications in the teaching of classes, as a function of the University. *n* = 125 professors.

Changes in the Teaching of the Classes	TOTAL	University				Chi-Square Test		Effect Size R^2
		U.Lleida (*n* = 75)	U.Tarapacá (*n* = 12)	U.A.S.B. (*n* = 10)	U.Tolima (*n* = 28)	Value	*p*-Value	
Contents	28.0%	30.7%	25.0%	10.0%	28.6%	1.93 N.S.	0.587	0.015
Learning activities	77.6%	77.3%	66.7%	80.0%	82.1%	1.19 N.S.	0.754	0.001
Period for turning in assignments	37.6%	36.0%	58.3%	40.0%	32.1%	2.66 N.S.	0.447	0.021
Evaluation activities	63.2%	65.3%	58.3%	30.0%	71.4%	5.82 N.S.	0.121	0.047
Hours of independent work of students	28.0%	21.3%	41.7%	20.0%	42.9%	6.15 N.S.	0.105	0.049
Class schedule	13.6%	12.0%	8.3%	40.0%	10.7%	6.58 †	0.087	0.052
Adaptations to cater to diversity	19.2%	16.0%	16.7%	30.0%	25.0%	1.90 N.S.	0.593	0.015
Advising/tutoring of students	60.8%	62.7%	41.7%	40.0%	71.4%	5.10 N.S.	0.165	0.041
Did not change anything	2.4%	2.7%	8.3%	0.0%	0.0%	2.76 N.S.	0.430	0.022
Other strategies	8.0%	10.7%	0.0%	0.0%	7.1%	2.67 N.S.	0.446	0.021

N.S. = Non-significant; † = Almost significant; Author created with IBM SPSS Statistics 25.

5.4. Differential Factors

Among the instruction strategies, few significant differences between the strategies utilized by women and men were noted. However, project-based tasks were very frequent ($p < 0.05$, moderate effect size: 0.046), and were more often utilized by men as compared to women (46.0% and 25.3%, respectively). The adaptations for catering to diversity were also notable (effect size 0.036), as one of the main modifications by the teachers, with women demonstrating more adaptations to diversity (23.5%), as compared with men (10%), as observed in Table 4:

Table 4. Comparative analysis. Instructional strategies utilized as a function of sex. *n* = 125 professors.

Instructional Strategies Utilized	Total (*n* = 125)	Sex		Chi-Square Test		Effect Size R^2
		Men (*n* = 50)	Women (*n* = 75)	Value	*p*-Value	
Teaching adaptation strategy Project-based tasks	33.6%	46.0%	25.3%	5.74 *	0.017	0.046
Modifications in the teaching of the classes Adaptations to cater to diversity	19.2%	10.0%	25.3%	4.55 *	0.033	0.036

N.S. = Non-significant; * = Significant; Author created with IBM SPSS Statistics 25.

Considering the independent variable of teaching experience (Table 5), the most utilized strategy for transitioning the face-to-face postgraduate courses to virtual environments was restructuring the evaluation (with an effect size of 0.055). In this case, the teachers with 11–20 years of professional experience modified the evaluations the most. The use of all other strategies showed no significant differences based on the amount of teaching experience.

Table 5. Comparative analysis. Teaching strategies utilized as a function of teaching experience. *n* = 125 professors.

Teaching Strategies Utilized	Total (*n* = 125)	Teaching Experience			Chi-Square Test		Effect Size R^2
		<=10 years (*n* = 23)	11–20 years (*n* = 32)	>20 years (*n* = 70)	Value	*p*-Value	
Teaching activities *Re-structuring evaluations*	63.2%	43.5%	78.1%	62.9%	6.92 *	0.032	0.055

N.S. = Non-significant; * = Significant; Author created with IBM SPSS Statistics 25.

5.5. Activities That Were Used with Most Success during the Pandemic

The sections above examined the range and frequency of instructional strategies utilized during the pandemic. To address questions regarding the relative success of these strategies, we made use of qualitative data from open-ended questions. Table 6 below indicates the most frequently cited activities that faculty reported using with success during the pandemic. Activities that received single responses or that totaled less than 5% of all responses were noted but not included in the table. It should be noted that not all respondents answered each of the open-ended questions, and some responded with two activities. Thus, the numbers in the table refer to the number of times that the most frequent activities or strategies were mentioned (Figure 2).

Table 6. Activities that were used with most success during the pandemic.

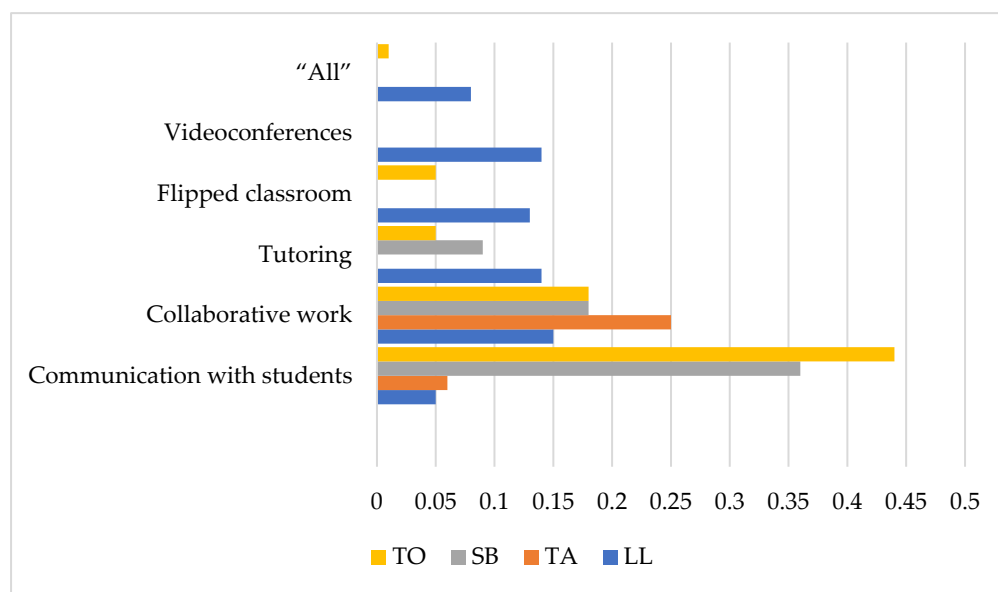|	LL ($n = 79$)	TA ($n = 16$)	SB ($n = 11$)	TO ($n = 39$)	Total ($n = 145$)
Communication with students	4 5%	1 6%	4 36%	17 44%	39 27%
Collaborative work	12 15%	4 25%	2 18%	7 18%	25 17%
Tutoring	11 14%	0	1 9%	2 5%	14 10%
Flipped classroom	10 13%	0	1 9%	2 5%	13 9%
Videoconferences	11 14%	0	0	0	11 8%
"All"	7 8%	0	0	1	8 6%

Figure 2. Activities that were used with most success during the pandemic. Scale out of 1.

The strategy found to be most successful overall during the pandemic, with 27% of the responses, was that of communicating with students. Faculties cited social media such as WhatsApp as well as the use of email as the most common forms of communication with students outside of class. Communication was cited as particularly important in two of the universities and appears to be connected to the ability of students to access online classes. One faculty member explained that telephone communication was used "in some cases in which the connection was non-existent".

Collaborative work, the strategy found to be most often utilized above (see Table 6), was found to be a successful activity consistently across all four sites. Collaborative work was successful because it "invigorated the classes" and fostered "the collective construction of knowledge". Another faculty member contended that collaborative work "provided more participation to the students, made them feel part of, and gave them a voice". One

faculty member specified that group work was accompanied by "tutoring the project from each group". The active participation of the faculty member in facilitation group work may be related to its success, and may be related to the fact, as we shall see below, that some faculty reported collaborative work to be unsuccessful during the pandemic.

Approximately 10% of the faculty found online tutorials to be necessary and useful because they "allowed for more personalized monitoring". This personalized student support was felt to be particularly necessary in the context of the pandemic, "because it was an unprecedented situation emotionally, and individualized and calm treatment was necessary". Another faculty member described the notable increase in the number of online conferences that s/he held, specifying that "the content (of the tutoring sessions) was very centered on specific aspects of the activities planned for the students or subjects that were dealt with in the videoconferences".

The flipped classroom, particularly in one of the sites, was described as another way of maintaining student interest and participation. One faculty member explained, "In the last 10 years, I have perceived that many of the students go to class without having reviewed their notes from previous classes, and without having read what was advised for the session. The flipped classroom, with class tasks that cannot be done without having previously read the material or done the previous tasks that were sent, makes them be up to date". A variety of other activities received less than 5% of the total responses each and were not included in Table 6 above. These included the use of projects, gaming, fostering more active participation, adapting the schedule for turning in assignments, and use of the digital platform in general, among others. Overall, activities that fostered active participation and collaborative work among students and communication between faculty and students were found to be most successful.

5.6. Activities That Were Not Successful

Table 7 and Figure 3 below reports the activities that faculty most frequently cited as not functioning well or not successful when used during the pandemic. It is worth noting, however, that the most common response among faculty across sites (25%) was not experiencing any problems with instructional activities during the pandemic. Considering the timing of the present study, with the survey applied 20 months after the start of the pandemic and institutional closures, it is likely that many among the faculty had been able to make a successful transition to online instruction.

Table 7. Activities that were not successful.

	LL (*n* = 65)	TA (*n* = 12)	SB (*n* = 10)	TO (*n* = 29)	Total (*n* = 116)
Everything ok/without problems	14 17%	3 25%	2 20%	10 34%	29 25%
Lectures	12 18%	2 17%	1 10%	1 3%	16 14%
Problems with platform/connectivity	2 3%	2 17%	1	8 28%	13 11%
Synchronous/in-person activities	4 6%	0	4 40%	3 10%	11 9%
Attention (including did not turn on camera, microphone	7 11%	2 17%	0	1 3%	10 8%
Evaluation (including virtual, practical, excessive)	7 11%	0	0	1 3%	8 7%
Group work	7 11%	0	1	0	8 7%

Among activities that were not successful, the use of a lecture format led the list with 14% of total responses, although there was considerable variability across institutions. In one institution, close to one-fifth of the responses centered on problems with lecture classes, which were described as "monotonous". One faculty reported having to discontinue two-hour lectures because students had difficulty in following them. Several faculties observed that "it was difficult to maintain the students' attention". Another reflected, "The lecture class did not work for me, as it did not have all the interaction elements that an online remote student needs".
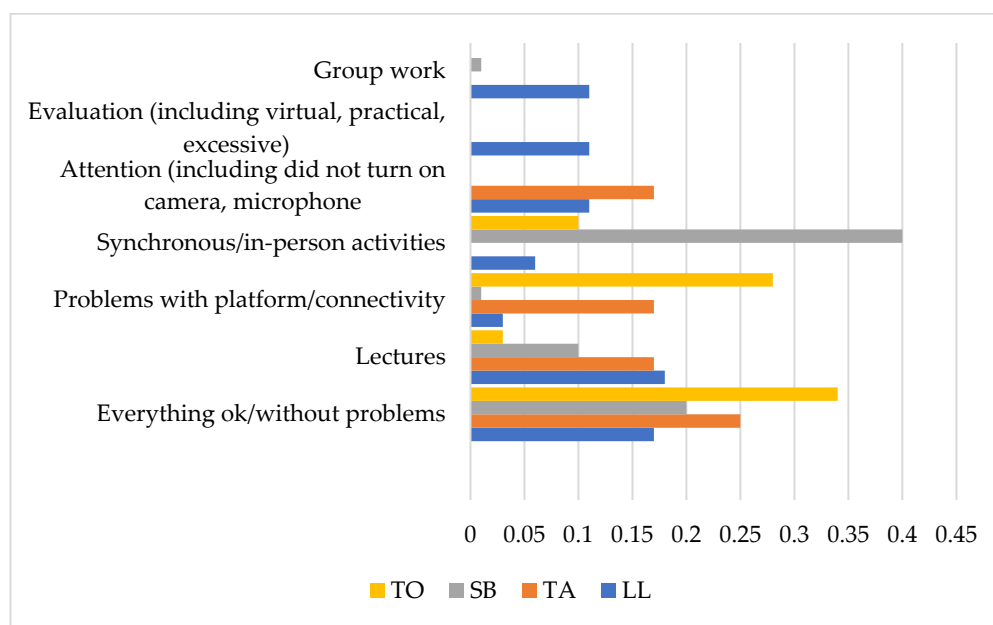
Figure 3. Activities that were not successful. Scale out of 1.

Lack of attention or participation on the part of students was reported as a problem in 8% of the responses. "I did not see if the students really connected to the sessions". One faculty member observed, "It is more difficult for the students to participate, turning the microphone and camera on is not easy for some of them". Even when trying to initiate more interactive activities such as debates, several faculties reported experiencing problems with student participation. One responded to the survey in all capital letters, "The student was not able to connect the camera". Lack of connection with the students resulted in a lack of feedback for the professor to indicate student comprehension of the material.

An interesting finding related to collaborative work. Although collaborative work had been found to be a successful strategy in close to one-fifth of responses (see Table 7 above), it was reported to be an unsuccessful strategy by others. One faculty member complained that in "group activities in general, a lot of time was invested in comparison to the productions made". Another faculty member reflected, "Collaborative work was not well received, given the cultural characteristics of our medium, in which these types of tasks are still not recognized as being useful, but instead as a process in which only a few work". Similarly, although online tutorials had been cited as one of the most successful strategies used, three responses cited online tutorials as unsuccessful due to the extra amount of time involved on the part of the instructor.

One issue that had implications for student participation was that of problems with connectivity to the online class and with the functioning of the institution's online platform. This was particularly noted in two of the institutions, where 17–28% of responses described connectivity and platform issues. One faculty member described the problem as extending beyond the individual classroom: "The use of platforms had to be unified. On many occasions, the students mentioned that each professor utilized different platforms and mechanisms, and for them it was difficult to have all the resources, for example, cell phones".

Other activities that were not successful, with each receiving less than 5% of the total number of responses, included continuing with the activities and schedule of assignments that had been used prior to the pandemic and continuing with required readings, especially those that were more theoretical in nature. Overall, responses to the question regarding unsuccessful activities mirrored those reported above for successful activities. Whereas most of the successful strategies and activities could be described as those that fostered active participation, those described as unsuccessful were those that did not permit active

participation or in which student interaction was difficult to achieve. This, in turn, has implications for student learning. As one faculty member observed, "Permanent interaction that allows us to address greater levels of complexity in the construction of knowledge is necessary".

5.7. Activities That Will Continue to Be Used

When asked which activities and strategies they planned to continue to use after the pandemic, faculty responses tended to replicate those found to be successful in online work. Table 8 and Figure 4 below reports the most frequently cited activities. Not surprisingly, the flipped classroom, online tutorials, and collaborative work were the activities most often mentioned, the activities that are expected to be transferred to face-to-face. In the case of the flipped classroom and tutorials, use was much more highly favored in one or two of the institutions, while the continued use of collaborative work appears to be more evenly distributed across sites. Close to one-fifth of the responses mentioned continued use of the interactive platforms, such as the use of the interactive break-out rooms in Zoom. Again, however, this was mentioned in three of the sites but did not figure prominently among the responses of the fourth.

Table 8. Activities that will continue to be used.

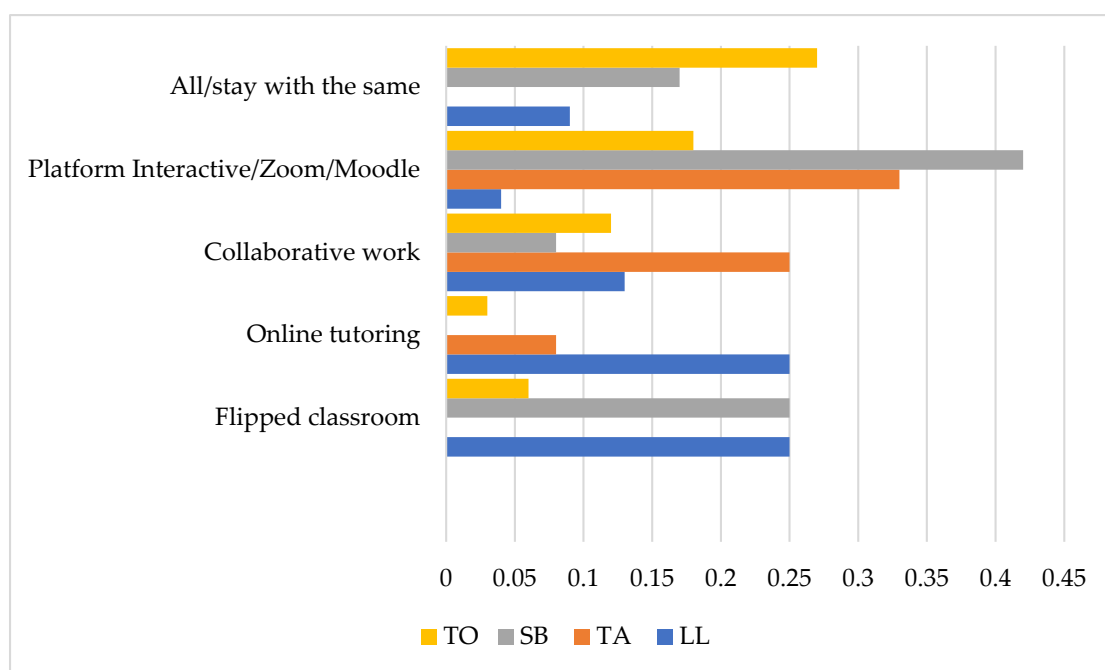|	LL (n = 79)	TA (n = 12)	SB (n = 12)	TO (n = 33)	Total (n = 136)
Flipped classroom	20 25%	0	3 25%	2 6%	25 18%
Online tutoring	20 25%	1 8%	0	1 3%	22 16%
Collaborative work	10 13%	3 25%	1 8%	4 12%	18 13%
Platform Interactive/Zoom/Moodle	3 4%	4 33%	5 42%	6 18%	18 13%
All/stay with the same	7 9%	0	2 17%	3 27%	12 9%

Figure 4. Activities that will continue to be used. Scale out of 1.

Other activities that were cited as worthy of continuing, but which were mentioned in less than 5% of responses, included the use of project-based learning, case studies, and audiovisual materials. Continued use of WhatsApp and other social networks, although foremost among the successful strategies during the pandemic, was only mentioned in

4% of the responses for activities to continue. This may be due to the greater likelihood of the use of social networks when students were experiencing problems with connectivity and with the online platform, which would not continue to be problems with the resuming of in-person instruction. Four of the faculty members stated simply that there were no activities that they would continue to use, while 9% of faculty said that they would continue with everything they were doing.

6. Discussion

As faculty in our study adapted instruction to meet the needs of their students during the pandemic, we observe that the instructional practices that they found to be successful and worthy of continued use were those that reflected identified "best practices" [31–33], that is, those that involved students in collaborative work and fostered active participation in online activities through the flipped classroom model and a variety of interactive online experiences in the virtual classroom.

The most common teaching activities were "Create materials", a very important activity when teaching virtually, followed by "Search for documents Online" and "Restructure evaluations". Virtual teaching, as indicated in studies by [1,2], implies scheduling processes, adapting the content to the digital format, and managing the information and communication well, in order to facilitate interaction, evaluation, and learning results.

The activities that were modified, as expected, were learning activities and evaluation [28], along with an increase in the number of advising/tutorship hours, given that didactic strategies and the manner in which interaction and evaluation remotely had to be modified. Providing the students with more time for advising/tutorship, as pointed out by [20], promotes active interaction and participation of students, providing evidence of the role as a companion that the professor must play in education mediated by the ICT.

Communication with students was one of the most successful activities in virtual teaching, having in mind that the ICT facilitate communication, as described by [8]. This, if done effectively and clearly, improves the quality of the educational process. Collaborative work, an activity that fosters interaction between students and teachers, and among students, was another reported successful activity that contributes to the development of skills and competencies when everyone is given an opportunity to participate in the construction of knowledge.

Within the activities that were not successful, we find lectures, because, as indicated by [9], the students did not have a chance to participate, the role of the student was to be passive and not as a protagonist in their own learning [6], which are characteristics of virtual learning. The roles of teachers and students have changed with the use of ICT in education processes [15]. The professor must guide and accompany the students in their learning processes, actively participating in an individual and collaborative manner, in the construction of knowledge, and this must be present in virtual education.

The strategies that will continue to be utilized in face-to-face teaching are the flipped classroom, as indicated by [9], as well as the tutorships and collaborative work. These strategies are being implemented in the b-learning modality [3,13,14,32], because they promote better interaction of the actors in the process, allowing for the construction of knowledge in a collective manner. In this modality, the student assumes a more active role than in face-to-face learning.

A hybrid education broadens the concept of b-learning not only when it combines face-to-face components with virtual ones, but also when it integrates the synchronous with the asynchronous, combining different active methods and techniques, and when ubiquitous learning is promoted [32–38], as observed in the results obtained in the present study.

The results obtained show that the most successful virtual strategies and activities are those that involve the active participation of students. It is therefore necessary for education professionals to reflect on this in order to encourage more active methods.

7. Conclusions

The change from face-to-face teaching to virtual teaching increased the use of ICT and has served to re-think and see other ways and opportunities to innovate teaching. More opportunities to participate were given to students, the role of the instructor changed to becoming a guide and a companion in the process, advising/tutorship hours increased, and collaborative work was promoted. Many of the strategies utilized were successful, and some of them will be incorporated when face-to-face teaching returns. Efforts made by the professors to migrate face-to-face teaching to virtual teaching are invaluable, despite the limitations they had to face when taking on this challenge.

Even though the Information and Communication Technologies have helped innovate the education processes, careful planning is needed that leads to true transformation so that they are not only used as simple platforms that store content, but that also modify learning strategies, the communication between the actors in the process, and the evaluation strategies.

Evaluation, as it was also a fundamental component of learning, also changed when transitioning the classes to virtual environments; as a result of the study, it can be inferred that most of the professors opted to re-structure the manner in which to evaluate the learning of the students.

Furthermore, it was observed how professors had to more often play the role of a tutor or companion to promote a greater acquisition of knowledge for the students who were most affected by the absence of a physical classroom. The results of the study highlight communication with the students and the tutoring hours, as successful activities during the pandemic, and also provide evidence that the personalized monitoring and communication of the teacher generated more confidence in the student.

The study has allowed us to discover that the adaptation to the changes produced in teaching in Higher Education institutions in different geographical areas in which the questionnaire was provided was very similar, with differences only found in subjects such as the class schedules, the hours of independent work, and the evaluation activities. Thus, there is evidence of the need to sustain good practices, such as promoting communication with students and maintaining collaborative work, which will allow shifting to a hybrid model of education whose nucleus is the student, without considering his or her physical presence in the classroom.

The main limitation of the study is that the Latin American sample was smaller in number than the Spanish one, given that the number of faculty in postgraduate studies was also smaller. Thus, in future studies, other contexts could be analyzed, both Latin American and Spanish, as well as others. Another limitation of the study, and also a future prospect, is to go deeper into the data obtained in relation to the reasons that informants had for using the selected strategies in the face-to-face setting. Finally, for future studies, differences by gender or other socio-demographic or academic variables could be analysed in order to gain a deeper understanding of the reasons for the results.

Data Availability Statement: The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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