



Return to Face-to-Face Classrooms in Higher Education: Students Experiences in Chile, Venezuela, and Ecuador

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Abstract

Emergency remote teaching (ERE) triggered by the COVID-19 pandemic posed significant challenges to higher education institutions worldwide. Although it had several negative consequences, it also enabled advances in the integration of technology into the teaching and learning process. The purpose of this study was to examine and characterize the key elements of the process of returning to face-to-face courses. The study was based on a mixed quantitative and qualitative design. 631 students from Chile, Venezuela, and Colombia were surveyed about their experiences returning to face-to-face classes (in terms of virtual tools, their feelings, and their expectations for academic success). The survey also included questions about the lockdown caused by the pandemic, specifically regarding instructional and didactic design, participation in online sessions, and the role of faculty during the pandemic. Descriptive and correlative analyses were performed to examine relationships among variables. Qualitative data were analyzed within a hermeneutically-oriented framework. Our analyses show that virtual classrooms or learning management systems (LMS) continued to be used after the pandemic. However, their use is strongly associated with a more traditional approach to teaching; LMSs and virtual classrooms are primarily used as filing locations and for receiving and storing homework assignments and assessments. In terms of interaction, qualitative analyses have shown that relationships with faculty and between students are better in face-to-face classes and that there is not much difference in perceptions of collaborative work in online learning compared to face-to-face classes. Finally, students' expectations of academic success are low in the short term, while they are higher in the long term. Students also indicated that it is important to them that teachers take care about the didactic design of the course, including strategies that encourage interaction and participation in both synchronous and asynchronous sessions. In addition, students mentioned that teachers should incorporate strategies to promote academic motivation, self-regulation, and a safe environment. An important finding of this study is that students prefer a blended learning format when comparing online and face-to-face instruction. This article also provides recommendations for the new post-pandemic education scenario.

Keywords:

Higher Education;
COVID-19;
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1- Introduction

In virtual education, teaching and learning processes are carried out exclusively through communication networks, mainly the Internet [1]. There is a consensus that virtual education offers flexibility and is very efficient. Moreover, virtual education allows students to overcome important limiting factors in the learning process, such as time, space,

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occupation, or age [2–4]. Virtual education is effective only if it is carefully designed and planned. Therefore, a systematic instructional model must be used for its design and development [5, 6], which includes a variety of interrelated elements that must be adapted to the educational objectives. In addition, virtual education must consider an appropriate technological environment that includes a user-friendly interface, technical support, and ethical considerations for data management [7, 8].

Virtual education provides students with more and greater learning opportunities [9], as it promotes autonomy, responsibility, leadership, and teamwork skills [10]. It also reduces the work of teaching staff and increases the active work of students [11, 12]. Virtual learning has been shown to expand and diversify how feedback is provided [13]. The benefits of implementing virtual learning are many: it increases self-regulation of learning, allows for consideration of diversity, provides opportunities for experiential and social learning, fosters the formation of learning communities [14], and allows for better support for students who are at higher risk of refusal and desertion [15, 16]. In particular, the virtual classroom is a space for educational innovation, characterized by being flexible and integrating content through different resources and learning activities [17].

Given the many benefits of virtual education, universities did not fully adopt it until after the pandemic [18]. Although many universities had begun integrating LMSs (Learning Management Systems) as a mandatory part of teaching prior to the pandemic, they were rarely used [19]. The resistance to implementing online learning was attributed to multiple factors, namely: a low assessment of the potential of virtual tools; a lack of knowledge regarding their benefits; a perception of high demand for time; difficulties in accessing proper equipment; a low quality of Internet networks; and a lack of other resources necessary for this modality [20]. These challenges were faced during the pandemic and produced several limitations for teachers, students, and higher education institutions [5, 21, 22].

From the student's perspective, the lack of knowledge regarding the technological aspects of online learning was the greatest challenge. From the teacher's perspective, the greater challenges were their low level of technical skills [23], their inability to adapt their pedagogical design for a virtual modality [24], and the lack of interaction and communication in virtual learning environments [25]. Also, a great challenge for teachers was not having access to technical support for content development [20]. There is also a wide discussion about the lack of connectivity, equipment, adequate physical space, and mental health aspects that influenced the educational processes during the pandemic [21, 26, 27]. All these issues should be addressed by higher education institutions.

For these reasons, virtual education in the context of the pandemic was called Emergency Remote Teaching (ERT) to differentiate it from a carefully designed virtual education [5, 28]. The learning obtained during the ERT has allowed teachers and university authorities to think about the possibility of integrating virtual and technological tools with traditional face-to-face education [29, 30]. Therefore, the emergency remote teaching scenario became an opportunity for transformation into what higher education could be in the future [31]; higher education institutions could go back to traditional teaching or could join the change and innovation in teaching methods, including new materials, mechanisms, and learning spaces.

The international trend is to promote the development of educational practices that allow for high-quality virtual teaching [31], where the Blended Learning (BL) modality emerges as one of the main potential initiatives for higher education [32–35]. BL would allow gathering all the learning acquired during the ERT, keeping the delivery of content exclusively online, and using the face-to-face sessions for active learning [36, 37]. It has been shown that face-to-face learning experiences and online experiences are mutually beneficial, increasing student learning [38–40]. Following the above, Jamilah and Fahyuni [41] indicate that in the post-pandemic period, online teaching must be modified and combined with face-to-face learning in blended methods, since this allows overcoming the deficiencies that both online and face-to-face modalities have.

As a result of the lessons learned during the ERT, there are certain elements of the teaching and learning processes that are associated with greater academic success and satisfaction in this teaching modality. For example, the recording of classes generates a positive effect on student satisfaction, being one of the resources reported as most used by them [26, 42]. Electronic response systems and collaborative work tools are also highly valued by students since they promote participation during ERT [43, 44]. Moreover, students prefer well-structured content and materials for subsequent assessments and tasks [22]. Regarding the structure that online learning has, students report feeling more motivated when they see a general preview of the course and when they can predict what is going to be next in their course since they have a greater possibility of planning [42]. It has also been shown that synchronous classes should not last more than 45 minutes to provide better levels of attention and concentration and that the degree of attractiveness of the online course is highly conditioned by the presence of high-quality audiovisual content, gamified activities, and feedback spaces [42, 45–47].

It has been reported that synchronous classes by video conference were the most used strategy during the ERT [48]. However, from the perspective of teachers, this modality presented a high level of complexity due to the difficulties in implementing activities in which students actively participated [49]. The lack of participation is associated with emotional discomfort, demotivation, and a greater perception of isolation and loneliness. Some authors point out that

the difficulties presented during synchronous sessions were caused by teachers attempting to replicate what was done during face-to-face lessons instead of changing the approach to online learning [50, 51].

Despite these findings, it is not clear how the transition towards face-to-face learning is being carried out. It is not clear if the virtual modality is being integrated into face-to-face lessons in a complementary way or if the traditional model prior to the pandemic has returned. Moreover, it is unknown if elements of the instructional and didactical design have been maintained or enhanced and what the role of teachers is in this new post-COVID-19 educational scenario.

This study aims to describe the return of university students to face-to-face lessons, addressing aspects of instructional and didactic design and the emotional experiences of students during the first period after the pandemic. Also, it deepens the recognition of the role that teachers should have in virtual education, considering the experiences of the students. We also investigated the pedagogical practices or strategies that promoted motivation in students to participate in synchronous classes by video conference. Our findings could guide the use of these strategies in a more effective way in response to a post-pandemic blended learning education.

Quantitative Objectives:

1. Explore the emotions (positive and negative) self-declared by university students during their return to presencial classes regarding their frequency and differences by country (Chile, Ecuador, and Venezuela).
2. Characterize the presenciality return experience in university students regarding the teaching modality, the relationship with professors, the relationship with classmates and the use of the virtual classroom.
3. Describe the perceptions of academic success during the first post-pandemic face-to-face semester.

Qualitative Objectives:

1. Describe the role of teachers in virtual education from the perspective of students.
2. Describe pedagogical practices that promote participation in synchronous virtual education instances.

2- Method

2-1-Design

The study was conducted using a mixed approach [52]. It considered two stages: quantitative scope with a descriptive correlational design and qualitative content using an inductive qualitative approach and the phenomenographic method.

2-2-Sample of the Quantitative Study

The sample was composed of 631 students from 3 countries: 250 (39.6%) were from Ecuador, 186 (29.5%) were from Chile, and 195 (30.9%) were from Venezuela. They had an average age of 22.05 (SD=4.28) years. 458 (72.6%) of them were women, 168 (26.6%) were men, 3 (0.5%) preferred not to say their sex, 1 (0.2%) declared to be homosexual, and 1 (0.2%) declared to be non-binary. Regarding the area of study, 424 (67.2%) were students from the area of social sciences, 103 (16.3%) were from health sciences, 31 (5.0%) from engineering, 27 (4.3%) from natural sciences, 23 (3.6%) from agricultural sciences, and 23 (3.6%) from humanities. Regarding the year of study, 451 (71.5%) reported being in the intermediate level (2nd, 3rd, or 4th), 103 (16.3%) reported being in their last year of study, and 77 (12.2%) reported being first-year students.

2-3-Instrument

For the quantitative study, an ad hoc questionnaire called "Questionnaire on university educational experiences in return to face-to-face classes after the COVID-19 pandemic" was constructed through a literature review, expert judgment, cognitive interview, and pilot application for face and format validity and ethical validity employing experts who reviewed that the indicators of the instrument do not generate harm to the participants. This type of instrument is recognized as necessary in the literature in the field of education because it responds more accurately to the research objectives, besides being one of the most widely used types of instruments [53].

The questionnaire has three sections of 19 closed questions with response alternatives and one section with two open questions. The first ones are a) emotions, which took as theoretical and empirical reference the PANAS [54]; b) characterization of the return experience; and c) expectations of academic success (see Appendix II). The qualitative section included the following two questions: What do you think the role of the teacher is in virtual education? Moreover, from your experience with virtual education, what strategies or teaching practices increased your participation in synchronous classes (video conferences) and why?

2-4-Data Collection Procedure

At the end of the first semester of the return to face-to-face classes, authorization was requested via e-mail from the participating universities in Chile, Ecuador, and Venezuela. Each university sent the instrument via a link to the electronic version with information about the objectives, scope, and others and informed consent so the participants

could express their willingness to participate (see Appendix I). The study considered all ethical aspects of research with human beings.

2-5-Plan of Analysis of the Quantitative Study

Descriptive analyses of the variables of interest and the sociodemographic variables were performed; in the case of the qualitative variables, frequencies were presented; and for the numerical variables, central tendency statistics were presented, such as the average. On the other hand, dispersion statistics were presented, such as the standard deviation.

To evaluate the relationship between the variables of interest and because they were all measured at a qualitative level, Pearson's Chi-square test was used for count data, and Cramer's V was used as the effect size statistic [55]. In the case of qualitative analysis, hermeneutically oriented text analysis was used to understand the meaning and significance of the written discourses on the experience with pandemic education.

3- Results

3-1-Quantitative Results

On one hand, negative emotions that were most common among students were shame (n = 512; 81%), inferiority (n = 488; 77%), and pessimism (n = 466; 74%). On the other hand, the least common negative emotions declared by students were stress (n = 98; 16%), anxiety (n = 160; 25%), and frustration (n = 288; 46%). Regarding positive emotions, students declared to mostly feel tranquility (n= 537; 85%), safeness (n= 517; 82%), and competent (n= 504; 80%). The positive emotions that were least common among students were happiness (n = 355; 56%), optimism (n = 377; 60%), and patience (n = 388; 61%).

There is no significant relation between positive emotions and the country of origin of students obtaining the value of $\chi^2(22, N=631) = 3.85$ and $p=0.99$. Negative emotions have a significant relation with the country of origin of students, with $\chi^2(26, N=631) = 66.92$, $p<0.001$, $V= 0.08$, and a small effect size; significant differences were found for anxiety $\chi^2(2, N=631) = 60.56$, $p<0.001$, $V= 0.31$, angst $\chi^2(2, N=631) = 25.68$, $p<0.001$, $V= 0.2$, boredom $\chi^2(2, N=631) = 21.27$, $p<0.001$, $V= 0.18$, and irritability $\chi^2(2, N=631) = 18.77$, $p<0.001$, $V= 0.17$ (detailed information is shown in Table 1).

Table 1. Self-perceived emotions by country of origin

	Chile (N=186)	Ecuador (N= 250)	Venezuela (N=195)	Total (N=631)	
Positive Emotions	Happiness	106 (57%)	138 (55%)	111 (57%)	355 (56%)
	Astonishment	148 (80%)	198 (79%)	151 (77%)	497 (79%)
	Competent	143 (77%)	206 (82%)	155 (79%)	504 (80%)
	Confidence	122 (66%)	174 (70%)	139 (71%)	435 (69%)
	Enthusiasm	124 (67%)	177 (71%)	138 (71%)	439 (70%)
	Gratitude	125 (67%)	191 (76%)	141 (72%)	457 (72%)
	Optimism	108 (58%)	156 (62%)	113 (58%)	377 (60%)
	Pride	147 (79%)	204 (82%)	151 (77%)	502 (80%)
	Patience	113 (61%)	155 (62%)	120 (62%)	388 (61%)
	Satisfaction	131 (70%)	186 (74%)	156 (80%)	473 (75%)
	Safety	148 (80%)	205 (82%)	164 (84%)	517 (82%)
	Tranquillity	158 (85%)	205 (82%)	174 (89%)	537 (85%)
Negative Emotions	Boredom	144 (77%)	158 (63%)	159 (82%)	461 (73%)
	Angst	91 (49%)	177 (71%)	103 (53%)	371 (59%)
	Anxiety	24 (13%)	105 (42%)	31 (16%)	160 (25%)
	Despair	124 (67%)	167 (67%)	137 (70%)	428 (68%)
	Demotivation	87 (47%)	117 (47%)	98 (50%)	302 (48%)
	Stress	29 (16%)	48 (19%)	21 (11%)	98 (16%)
	Frustration	76 (41%)	121 (48%)	91 (47%)	288 (46%)
	Uncertainty	102 (55%)	164 (66%)	124 (64%)	390 (62%)
	Inferiority	134 (72%)	199 (80%)	155 (79%)	488 (77%)
	Irritability	93 (50%)	176 (70%)	120 (62%)	389 (62%)
	Fear	121 (65%)	168 (67%)	133 (68%)	422 (67%)
	Pessimism	131 (70%)	183 (73%)	152 (78%)	466 (74%)
	Sadness	127 (68%)	194 (78%)	142 (73%)	463 (73%)
Shame	148 (80%)	203 (81%)	161 (83%)	512 (81%)	

Note: percentages are calculated according to the total N of each country.

While most students perceived a better learning experience in a face-to-face modality compared to online classes ($n = 451$; 71%), only a small percentage of students declared to prefer both modalities ($n = 98$; 16%). Moreover, only 82 students declared that the face-to-face modality was worse than online learning ($n = 82$; 13%). Regarding their preferred relationship, 354 students (56%) declared to have perceived that it was better face-to-face learning, 236 students (37%) declared that their relationship with teachers was the same in both modalities, and 41 students (6%) declared that their relationship with teachers was worse during online classes.

Finally, the data analysis country of origin resulted in a significant difference in the relationship of students with their teachers when returning to face-to-face classes $\chi^2(4, N=631) = 11.78, p<0.05, V= 0.10$. Furthermore, the perception of students regarding learning modalities was significant for Chile, with $\chi^2(4, N = 631) = 10.21, p<0.05$, and $V = 0.09$. In both cases, the effect size was small (detailed information is in Table 2).

Table 2. Students' experiences regarding the learning modality and their relationship with teachers

Return to face-to-face	Face-to-face education			Relationship with teachers		
	Chile (N=186)	Ecuador (N=250)	Venezuela (N=195)	Chile (N=186)	Ecuador (N=250)	Venezuela (N=195)
Worse than online	18 (10%)	34 (14%)	30 (15%)	5 (3%)	18 (7%)	18 (9%)
The same as online	19 (10%)	46 (18%)	33 (17%)	61 (33%)	102 (41%)	73 (37%)
Better than online	149 (80%)	170 (68%)	132 (68%)	120 (65%)	130 (52%)	104 (53%)

While most students ($n = 439$; 70%) perceived a better social relationship with their classmates during online learning than during face-to-face learning, a small percentage of students ($N = 159$; 25%) declared that their relationship with classmates was the same during both modalities. Moreover, only 33 students ($N = 33$; 5%) stated that their relationship with classmates was worse during face-to-face learning compared to online learning. The results also showed that 271 students (43%) perceived that collaborative work with classmates was the same in both online and face-to-face learning, 278 students considered that collaborative work was better during face-to-face learning, and 82 (13%) students declared that the quantity of collaborative learning activities decreased when returning to face-to-face classes.

Finally, if data is analyzed by country of origin, results show that both the relationship with their classmates [$\chi^2(4, N=631) = 8.62, p=0.07$] and the perception of collaboration (through collaborative work) with classmates [$\chi^2(4, N=631) = 4.15, p=0.38$] do not show significant differences (see Table 3).

Table 3. Students experiences according to learning modalities and their collaborative and social relationship with classmates

	Relationship with classmates			Collaborative work with classmates		
	Chile (N=186)	Ecuador (N=250)	Venezuela (N=195)	Chile (N=186)	Ecuador (N=250)	Venezuela (N=195)
Worse than online	5 (3%)	18 (7%)	10 (5%)	22 (12%)	37 (15%)	23 (12%)
Same as online	38 (20%)	67 (27%)	54 (28%)	76 (41%)	115 (46%)	80 (41%)
Better than online	143 (77%)	165 (66%)	131 (67%)	88 (47%)	98 (39%)	92 (47%)

Most students declared that their teachers still use LMS during face-to-face learning occasionally ($n = 203$; 42%), 119 students (24%) declared that teachers use the LMS never or almost never, and 167 students (34%) declared that their teachers use it always and almost always. Moreover, 243 students (50%) declared that their teachers use the LMS as a repository, and 119 students (24%) declared that the LMS is used to send and receive homework (see Figure 1).

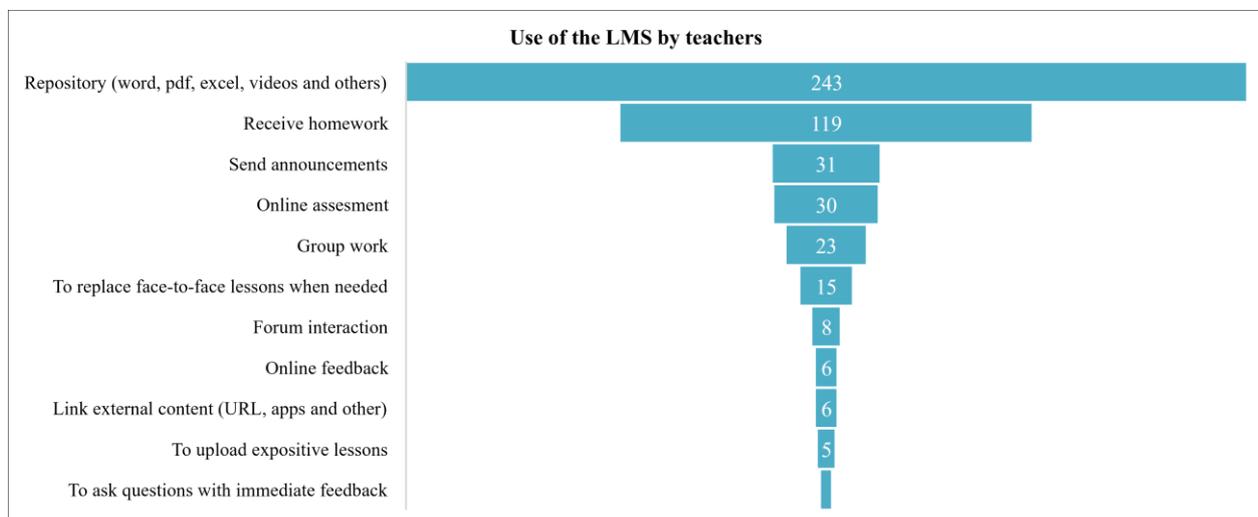


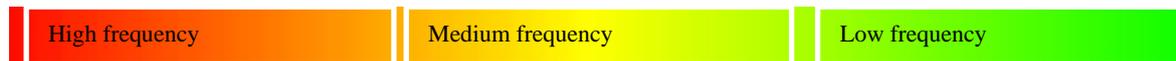
Figure 1. Teachers' use of the LMS

Regarding learning strategies, 251 students declared that the learning strategy that was used the most was expositive lessons, while 124 students declared that teachers used strategies in which they had to apply something. On the other hand, the least preferred strategies were simulations and debates; 317 and 219 students put them in ninth place, respectively (see Table 4).

Table 4. Heat map of the frequency of strategies used by teachers

Strategy	Preference order								
	1	2	3	4	5	6	7	8	9
Collaborative (in groups or couples)	100	123	165	123	63	38	9	6	3
Strategies that involve applying something	124	102	94	89	84	72	37	18	10
Research (autonomous search for information)	26	46	73	78	109	169	85	37	7
Debates	3	7	13	17	34	44	173	120	219
Expositive classes	251	127	79	72	52	23	18	8	0
Reading (pdf, word or other)	80	128	92	88	125	50	34	22	11
Problem solving	12	20	24	34	46	86	151	221	36
Simulations	1	10	15	12	21	30	59	165	317
Technology and Communications (videos, infographics, immediate response systems and others)	33	67	75	117	96	118	64	33	27

Nota. Graphic heat coding



The data was also analyzed by the student's country of origin, in which no significant differences were observed regarding the most and least used strategy with $\chi^2(18, N = 631) = 28.69, p = 0.05$ and $\chi^2(16, N = 631) = 16.38, p = 0.43$, respectively. Academic success is defined as students' perception of performing academic activities successfully when returning to face-to-face classes; 263 students (42%) were sure or very sure of performing successfully at their academic tasks, 237 students (38%) were unsure about their academic success, and 131 students (21%) were barely sure or unsure regarding their academic success (see Figure 2). When analyzing the data by considering the country of origin of students, no significant differences were found [$\chi^2(4, N = 631) = 3.30, p = 0.51$].

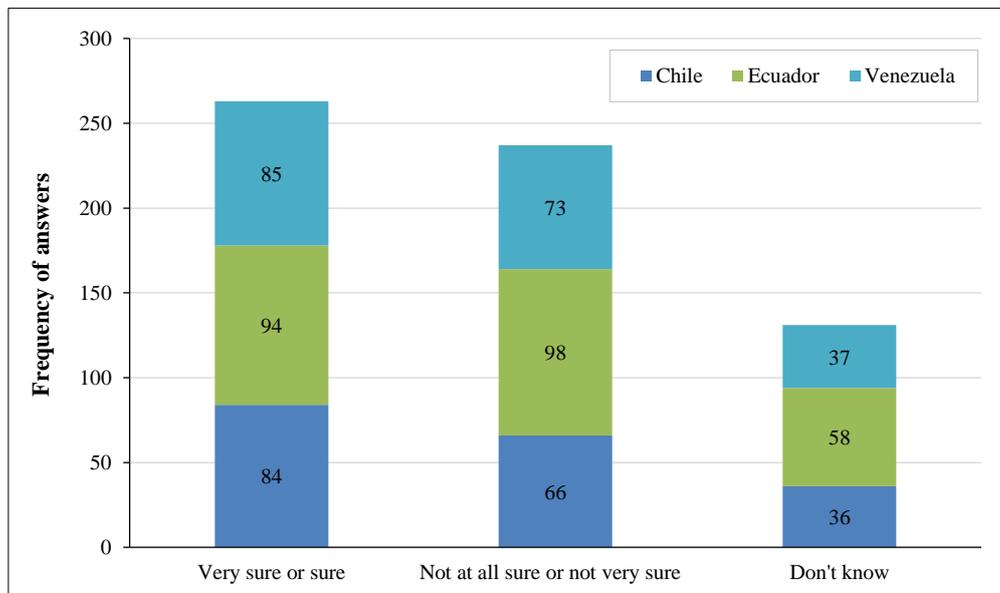


Figure 2. Students' perception of performing academic activities successfully when returning to face-to-face classes

The survey also analysed students' beliefs of finishing their degree; 492 students (78%) believed that they would obtain their degree successfully while 115 students (18%) declared that they may or may not obtain their degree, and 24 students (4%) answered that they believed that they will not get their degree. No significant relation was found when analysing the data by the country of origin of students with $\chi^2(4, N=631) = 37.02, p<0.001, V= 0.17$. The effect size was médium (see Table 5).

Table 5. Academic success during the first semester of face-to-face classes, after the pandemic

Academic success (Finishing their degree successfully)	Chile (N=186)	Ecuador (N=250)	Venezuela (N=195)
They would finish their degree	165 (89%)	165 (66%)	162 (83%)
They may or may not finish their degree	17 (9%)	69 (28%)	29 (15%)
They will not finish their degree	4 (2%)	16 (6%)	4 (2%)

Based on their experiences with online, face-to-face, and blended modalities, students were asked which of these modalities they preferred; most students answered that they preferred a blended modality (n = 396; 63%), while only 38 students (36%) declared that they preferred an online modality. Besides, only 197 students (31%) answered that, if they could choose, they would prefer a face-to-face modality. There was a significant relation between the chosen modality and the country of origin of students, with $\chi^2(4, N = 631) = 20.76, p < 0.001, V = 0.13$, and a small size effect (see Table 6).

Table 6. Preferred learning modality

Modality	Chile (N=186)	Ecuador (N=250)	Venezuela (N=195)
Blended	117 (63%)	134 (54%)	145 (74%)
Face-to-face only	59 (32%)	98 (39%)	40 (21%)
Online	10 (5%)	18 (7%)	10 (5%)

Finally, the expectations of academic success and the preferred learning modality have a significant relation with $\chi^2(4, N=631) = 35.69, p < 0.001, V = 0.17$ and a medium size effect (see Table 7).

Table 7. Expectation of academic success and preferred learning modality

Academic success	Preferred learning modality		
	Hybrid	Face-to-face only	Online only
They would finish their degree	307 (78%)	169 (86%)	16 (42%)
They will not finish their degree	16 (4%)	4 (2%)	4 (11%)
They may or may not finish their degree	73 (18%)	24 (12%)	18 (47%)

3-2- Qualitative Results

Students said that the role of teachers during virtual education was associated mostly with the search, selection or design of learning resources and activities (Table 8). The selection of learning resources must be accurate so that they are relevant to the learning results. Moreover, the quantity and variety of learning resources and activities must be adequate to safeguarding a balanced academic load. In addition, these resources and activities should be properly integrated in both the asynchronous and synchronous classrooms. Another element highlighted by the students is that teachers should keep the virtual classroom well organized, in such a way that is easy to use and that favours the learning process.

Table 8. Role of teachers in online learning

Category	Dimensions	Unit of analysis
Didactic design of learning resources and activities	Search	"Effort of the teacher in searching for the right digital tools" (P499)
	Selection	"The use of technology as a pedagogical tool...searching for software's that are right for our professional goals" (P472)
	To avoid academic overload	"To have a strategie... namely, to not overload the virtual classroom, to only select the necessary resources and activities" (P439)
	To combine learning resources and activities	"A teacher used to show very interesting videos and movies related to real life experiences, these videos were properly linked to course contents, it was a great way of teaching" (P518)
To promote self-regulation	To structure the learning process	"The organization in the virtual classroom... showing from the begining the important dates and the academic work that has to be developed" (P631)
		"Written and detailed instructions" (P333)
		"Direct instructions with feedback" (P180)
	To encourage autonomy	"Autonomous work was more effective for learning" (P535) "The autonomy of searching for materials" (P367)
To encourage self-assessment	"Encourage self-criticism and self-learning" (P567)	

To promote interaction	With learning resources and activities	“Teachers used different resources such as videos... that motivated me a little more (P201)” Read texts and then ask about them, to ask questions in class, send complementary activities on the subject and then discuss the results in class” (P320)
	Among students	“Cooperative work where there is support from classmates and it is possible to better understand the contents when interacting with each other” (P64) “Group discussions on the topics of the subject and online forums” (P345) “Shared screen on which students can write” (P386).
	Among the teacher and students	“Discussions in which teachers express their points of view and make us express our points of view as well as our experiences “(P485)
Reduce the complexity of virtual tools	“That explained the platform well and thus one did not take so long in learning how to use it... one was encouraged to work with mobile applications” (P250)	
To link and to integrate the asynchronous and synchronous classrooms	“Complementary activities on the subject to later discuss the results in class” (P320) “We were asked to read more than usual, the good thing and what motivated me was the classes after in which the texts or chapters were analysed” (P18). “Conversations related to subjects that were shown in the virtual classroom” (P311).	
Academic motivation	“That the teachers take a few minutes from the classes to motivate us” (P474) “The motivation they gave us to keep going and not stay stuck” (P513)	

Regarding the development of general non-disciplinary competences, it is highlighted that students mention the need for a teacher who promotes self-regulation practices. Students explicitly mention the need for a well-structured virtual classroom and learning activities that promote autonomous work, self-assessment, and critical thinking. Students also mentioned that teachers should encourage interaction with learning resources and activities that are in the virtual classroom, or LMS. Moreover, teachers should also encourage interaction between students and students-teachers’ interactions. Finally, students also mentioned that teachers should motivate them during the learning process by sending supportive and encouraging messages related to students’ performance (Table 9).

Table 9. Strategies that promote participation during online synchronous classes

Category	Dimensions	Unit of analysis
About interaction	Written communication media	“That the chat is read by the teacher” (P88) “The collaboration through chat, the ease of commenting without interrupting the teacher and that they could read the messages when possible” (P309) “To have a chat in Meet or Zoom, without the need of using the microphone” (P380) “To use WhatsApp, I am shy when using the video camera” (P316)
	Using virtual reactions	“Everyone could participate at the same time when using virtual reactions or emojis” (P190) “Using interactive strategies that were not completely verbal, interacting through gestures or virtual reactions” (P80)
	Pay attention to virtual reactions	“That the teacher stopped and took a time to recognize who was raising their hand (virtually)” (P203)
About learning resources and activities	Use of immediate response systems	“To implement online quizzes with apps such as Kahoot or Queez to promote an active learning environment” (577)
	Gamification	“To use gamification to reinforce the contents of the class” (P253) “To implement activities with playful apps in such a way that everyone could participate at the same time” (P190)
	Voluntary response questions	“Voluntary open questions” (P416) “Teachers always stated that participation was voluntary” (P221)
	Guided questions	Teachers asking questions to each student individually and randomly kept my attention in the class” (P203) To ask questions randomly” (P347)
About Confidentiality / anonymity / non-exposure / willfulness	To switch on cameras voluntary	“To not force anyone to use their camera” (P279) “To not beeing seen make me feel less ashamed” (P219)
	To stop recording during classes	“To not record ahah, when discusing something” (P280) “To stop recording, some teachers pause recording when opinions or personal experiences were shared” (P368)
	Anonymous contribution	“Anonymous surveys” (P53) “When the teacher could not see what we were doing” (P117)

Students describe pedagogical practices that motivated their participation during synchronous learning (videoconferencing). This includes asking questions, giving opinions, and sharing their experiences with the class. Students mentioned as effective strategies for the promotion of synchronous participation that the teacher is constantly paying attention to chat. Moreover, students mentioned that it is important for them that the teacher responds to what they write on it, even if the response is through virtual reactions or emojis. Regarding learning activities that are used by teachers during the classes, students said that using gamification apps and activities that involve questions enhanced their participation. Finally, some students mentioned the importance of having activities where they can keep anonymity in their interactions. Furthermore, they rather prefer when the recording of the lesson is paused when they are giving personal opinions about the content of the class.

4- Discussion

4-1- Quantitative Analysis

4-1-1- Self-Declared Emotions of University Students about Returning to Face-to-Face Lessons after the Pandemic

The most common negative emotions that students declared to have during face-to-face lessons were shame, inferiority, and pessimism. This could be attributed to a detriment in students self-image caused by the lack of physical contact and interaction due to the emergency remote teaching during the pandemic, which also limited the development of students' social abilities [42]. Other emotions, such as shame and insecurity, could be caused by the sudden return to face-to-face lessons, which forced students to interact with their peers. Feelings such as shame and inferiority can also be related to the fact that, during the pandemic, students felt that they did not learn as much as they would have learned without the pandemic [56, 57]. The decrease in self-confidence about their knowledge produces a feeling of pessimism towards returning to face-to-face lessons [58].

The most common positive emotions that students declared to have during face-to-face lessons were tranquility, safety, and feeling competent. Feelings of tranquility and safety are probably associated with the end of the pandemic and, therefore, with the improvement of sanitary conditions worldwide. The feeling of being competent could be associated with and increased by the interaction with other people, which results in more positive feedback from different sources; students can perceive positive non-verbal feedback from teachers, and students can easily receive feedback from other students, not only in a formal classroom environment but also during breaks or outside the institution. The reception of positive feedback increases the levels of self-concept and self-efficacy in students [59, 60].

The interventions of educational institutions are key to overcoming the negative impact of the pandemic on students' emotions. Institutions should implement actions to improve the mental health of students and monitor the return to face-to-face learning [61]. Furthermore, it has been shown that the support that teachers give to students has an impact on their academic emotions (negative and positive) [62]. On the contrary, not taking action on approaching students' emotions would increase the risk of students having mental disorders or would even aggravate existing mental disorders.

This study also found that self-perceived emotions of anxiety, angst, boredom, and irritability are much higher in Ecuador than in Venezuela and Chile. This is something that must be studied further to determine the specific factors that may be influencing this feeling in students and to implement actions to improve the situation.

4-1-2- Experiences of Returning to Face-to-Face Lessons Regarding the Learning Modality, the Relationship with Teachers and Classmates, and the Use of a Virtual Classroom

Most students perceived that face-to-face learning was better than online learning. However, blended learning seems to be the best option when compared to both face-to-face and online learning. This is consistent with the findings of Kedraka et al. [63], who found that students would rather choose face-to-face learning but highlighted interesting aspects of learning with technology that should be included in their learning process after the pandemic. Positive perceptions about blended learning are usually related to the advantages of combining two different modalities of teaching, enhancing the benefits of both face-to-face and online learning [51, 64]. The implementation of a blended learning system would also improve the educational system in terms of equity, quality, and inclusion [63, 65, 66]. Moreover, recent studies indicate that students perceive that online learning gives them flexibility in terms of the space and time in which the teaching and learning processes happen [32, 41, 64]. Further, the use of technology allows for the diversification of learning strategies, which increases students' motivation.

We also found that 56% of students perceived a better relationship with teachers during face-to-face learning, whereas 37% of students thought that their relationship with teachers was the same during online or face-to-face lessons. This result is relevant since one would have expected to find that most students perceived a better relationship with teachers during face-to-face learning since it was one of the greatest longings during the pandemic [10, 27]. The relationship between teachers and students was also the weakest point in online learning during the pandemic. Therefore, it was expected that this point would have improved greatly with the return to face-to-face teaching. In this regard, it is important to mention that some investigations are already showing that online education increased opportunities for communication between teachers and students since there were a variety of options that were not present before, such as chats and forums, among others [50, 63, 66].

As for the social relationship with peers, most students declare that this is better during face-to-face learning than during online learning. The interaction with their classmates plays a crucial role in the experience of adapting to university life, in the development of friendship, and in acquiring positive social experiences [67]. Moreover, the possibility of interacting physically with other students influences their perception of support when facing challenges and the creation of a closed social environment that strengthens the development of an individual personality [68].

However, when it comes to academic collaborative work among peers, about half of the students recognize that virtual learning promotes these kinds of activities to the same extent than during face-to-face learning. This is consistent with research in which it has been found that online learning is suitable for implementing several collaborative tools, such as online documents, virtual blackboards, and breakrooms, among others [69]. Online learning also enhances the implementation of teaching strategies based on collaborative work since it allows for time optimization and the generation of feedback among peers [29].

Contrary to what was expected, this study found that teachers still use a learning management system or virtual classroom during face-to-face teaching. In fact, 34% of students declared that teachers use always and almost always the virtual classroom. This means that the use of technology for the teaching and learning processes can still be enhanced during face-to-face classes, complementing and enriching the strategies that are usually used [35]. Although virtual classrooms are still being used, their use does not fulfill the minimum requirements for a high-quality online or b-learning process since they are used as repositories. Therefore, LMS or virtual classrooms are not being used to their top potential; the more useful and complex tools are still not integrated as part of the pedagogical planification of teachers. Therefore, teachers are still designing classes with a traditional pedagogical background, and this is replicated in the virtual classrooms, or LMS [5, 48].

4-1-3- Perceptions of Academic Success During the First Face-to-Face Academic Period after the Pandemic

In this study, we found that most of half of students declared to have low expectations regarding their academic success. In 2022, Lobos et al. [3] found that although students had great qualifications during the pandemic, they thought they learned fewer things compared to what they would have learned in face-to-face teaching. Therefore, it is possible that the low expectations of students are due to the thought of not having learned as much during the pandemic despite their good qualifications. Furthermore, this means that students do not believe they have all the tools to face the challenges of face-to-face learning since certain elements that were common during the pandemic, such as more flexibility [70], are not allowed anymore. For example, during the pandemic, it was possible to answer an assessment with classroom notes or to work in collaborative groups to get a score.

A positive aspect found in this research is that students have high levels of expectations when they are asked about obtaining their degree. In contrast, there is a group of students that still have low expectations for academic success; however, this feeling is associated with a limited period, which can be considered a period of adaptation. To ascribe academic challenges to specific periods is important since it allows students to feel that there is more control over them. Therefore, it allows students to be more active when searching for internal and external resources to overcome difficulties [68, 71]. Although low levels of expectation are temporary, it is important to acknowledge that these feelings still have a great impact on academic performance and the motivation of students [72]. Hence, institutions should implement pedagogical strategies that help students go through this period of adaptation and avoid poor performance, drop out, and failure of students.

4-2- Qualitative Analysis

4-2-1- Students' Description of the Role of Teachers during Online Education

Students declared that the role of teachers during online education is mostly related to the instructional and pedagogical design. Students recognized that choosing suitable learning resources and activities is key to their learning process and that this decision is part of the teacher's task. Also, students declared that teachers should achieve a balance between quantity and diversity of learning resources so that the academic load is adequate. This is consistent with the key elements for a high-quality virtual education [35, 73] and with the TPACK model (Technological, Pedagogical, and Content Knowledge), which states that successful integration of technologies in the teaching and learning processes requires a teacher that can integrate the disciplinary content, the pedagogical strategies, the technology for teaching, and the integration of these three elements [74–76]. Therefore, as students also recognized, not all the technological tools are relevant for their learning process, but only the ones that have a pedagogical intention [77]. Hence, it is important to study which technological tools are useful in certain pedagogical situations [29].

It is also worth mentioning the importance that students attribute to the academic load balance and the design of the learning resources and activities, which are associated with the cognitive load theory [78]. This theory states that the quality of instructional design will improve if designers pay attention to the limitations and the role of the working memory of students. The working memory is composed of three different cognitive loads: the intrinsic cognitive load,

the relative cognitive load, and the extraneous cognitive load [79]. The relative cognitive load is related to the cognitive effort that is required for a specific task. Therefore, this load is directly related to the difficulty associated with a specific instruction. The intrinsic cognitive load is related to the cognitive processes of attention and concentration that are needed to learn something. Finally, extraneous cognitive load is related to an effort that the learner must make to handle external elements that interfere with learning, such as unclear instructions or extra information that is not related to the learning itself.

An efficient and effective instructional design must minimize extraneous cognitive load, balance relative load, and promote learners' intrinsic cognitive load [79, 80]. Diminishing the extraneous cognitive load is associated with what students recognize as the role of teachers in decreasing the complexity of the use of technological tools. This means that students themselves recognized that using virtual tools should not be more complex than the content that they were trying to learn. Therefore, it is crucial for teachers to recognize technological tools that are efficient for learning and whose complexity is adequate for students. If the virtual tool is perceived as difficult to use by students, technological acceptability will be low, and students will develop resistance behaviors towards it, which in turn will hinder the learning process [3].

It is also interesting that students can recognize the relevance of a suitable integration of synchronous and asynchronous learning, which is something that has been widely discussed in the literature [81]. This means that teachers should intend the integration of both synchronous and asynchronous learning since the beginning of the design of the educational experience, thinking previously about the most useful strategies for their integration. This is also consistent with the community of inquiry framework (COI) [82, 83]. This framework states that in virtual environments, knowledge is built through the development of a community that is characterized by three components [84–86]: (i) the pedagogical component, (ii) the social component, and (iii) the cognitive component. The first component considers the design, facilitation, and interaction in the educational process. The second component is related to collaborative learning among students. The third component is related to the interaction of students with the learning activities and resources for the autonomous acquisition of knowledge. A proper integration of synchronous and asynchronous learning, mediated by the teacher, enhances the development of these three components and allows a greater use of educational opportunities.

Students also recognize the relevance of teachers using strategies that promote their self-regulation. Among these strategies, students declared: to have a well-structured virtual classroom; to develop autonomous work; and to implement self-assessment and self-reflection activities. This is consistent with Zimmerman's cycle of self-regulated learning [87], in which there are three stages of self-regulation: forethought, monitoring/performance, and assessment. Self-regulated learning is a cognitive-motivational variable that has been shown to have a significant impact on the academic success of university students [88], so its promotion has become an imperative task, especially in the first years of studies.

Furthermore, the theory of self-determination of Ryan & Deci [89] states that students must fulfill three psychological needs to have a successful learning experience: autonomy, competence, and relatedness. Autonomy and competence are related to the structure that teachers design for the learning process. The structure should be clear and unambiguous, with learning activities that allow students to identify their successes and failures, in which successes are key to overcoming failures [90, 91]. Relatedness is associated with the role of teachers regarding the promotion of interaction, which is consistent with what was stated by students. According to students, the teacher is responsible for promoting interaction in online learning.

4-2-2- Pedagogical Practices that Promotes Participation during Synchronous Lessons

Students declared that they participate more during synchronous lessons when the teacher gets involved through any kind of digital language. In this sense, it is important that teachers use juvenile language since it makes students feel closer to them, which means that they are involved and interested in their learning process. When the teacher uses this type of language, it conveys to students a higher level of involvement and interest in their learning processes [59, 92].

Students also mentioned that immediate response systems enhance their participation during synchronous lessons. This strategy has been found to be highly effective in studies performed before and during the pandemic [43]. Students value immediate response systems as they are perceived as a dynamic tool that allows them to have an active role in their learning process. Also, this tool allows students to obtain immediate feedback in both individual and group activities. This is consistent with the study performed by Meccawy et al. [93], in which they found the same positive appreciation of students towards immediate response systems. This strategy can be used for various purposes, namely, with a social-academic purpose, to activate previous knowledge, for assessment, and others [46, 94, 95]. Furthermore, immediate response system software is an easy-to-use tool that is available for free or at a very low cost.

Students also mentioned that strategies based on gamification motivate them to participate more during synchronous sessions. It has already been shown that gamification promotes motivation since it emulates video gaming and keeps the attention of students while also generating a fun environment for learning [46, 47].

Students stated that voluntary response questions also motivated them to participate during synchronous sessions. This is probably because when the question is directed to a specific student, they feel that it is for the purpose of controlling or forcing students to participate without a genuine intention to know what the student has to say. Along with this, students have a positive view of the privacy and protection of their personal experiences that are shared during synchronous sessions when the teacher is psychologically concerned about them by pausing the recording when personal contributions are being made. This type of teaching practice makes students feel protected, as they are not exposed to embarrassing situations, avoiding bullying or violent episodes, and promoting healthier learning environments.

Students also mentioned that strategies that allow them to ask and answer questions, give opinions, and share experiences enhance their motivation during synchronous sessions. These strategies are usually related to active learning strategies [96]. Active learning strategies promote collaborative and meaningful learning, which enhances interaction between students and between teachers and students [97]. In this kind of strategy, students are the center of their own education since knowledge is democratized, constructed, and enriched by everyone's experiences and input [98, 99].

Students express that teachers who transmit high expectations motivate them to participate more in synchronous classes, for example, when they recognize their successes and praise their contributions to the class. These practices have a positive impact on students' academic self-concept, along with creating a safe and trusting atmosphere in which mistakes are considered learning opportunities and where students are more willing to share their knowledge, ideas, and experiences [100].

4-3- Limitations

Regarding the limitations of this study, the sample size per country was small, so the analyses were limited, and the results should be treated with caution regarding their generalizability. Future research should address differences between countries and knowledge areas.

Regarding virtual tools, it is still not clear in which subjects their use has more impact. Moreover, there is no clear evidence on whether the use of virtual tools actually has an impact on educational outcomes. Therefore, it is important to further research this topic and conduct experiments that can empirically demonstrate that the use of virtual tools can lead to improved learning outcomes. Research should also focus on teachers' experiences with virtual tools. Because this study focused on the return to face-to-face learning immediately after the pandemic, it is possible that the results are subject to idyllic hindsight. Idyllic hindsight is related to a cognitive bias in which people in stressful situations develop a positive evaluation of the past and pessimism toward the present. Therefore, this survey should be repeated in the future to allow students time to become accustomed to face-to-face learning. Conducting the survey again during a more stable time period would lead to a more accurate analysis of students' experiences with face-to-face and online learning.

Another limitation of this study is related to the main feature of the ERE. Due to the sudden introduction of online learning, the instructional design was poor. Therefore, it is possible that the perception of the success of some strategies is influenced by this. Future studies should examine online learning in an optimal environment where its implementation is carefully planned. In addition, the biases associated with self-report instruments must also be considered.

4-4- Conclusion

The purpose of this study was to describe the experiences of university students when returning to face-to-face classes. From the results, it can be concluded that the return to face-to-face teaching is reminiscent of the pedagogical practices of traditional education before the pandemic. Thus, there is no profound integration of the knowledge acquired during the pandemic in relation to the newly learned technologies. Nonetheless, virtual classrooms continue to be used, and students indicated a preference for a blended learning form of instruction. This finding is significant because it opens up new opportunities to take advantage of online learning and apply the knowledge gained during the pandemic.

It was found that the most successful strategies during ERE were those that promoted collaborative learning and interaction between students and teachers. In addition, students valued virtual tools that allowed interaction with faculty during synchronous sessions. In this sense, it is important that faculty use various virtual media to communicate with students during synchronous sessions and protect students' psychological integrity. The virtual tools most valued by students were chat, electronic response systems, and digital whiteboards.

Students' self-efficacy in academic achievement is low in the near term, but not in the future. Students believe that they are not prepared for face-to-face classes, but they believe in their abilities to overcome these deficits and complete their studies. Therefore, the support that higher education institutions can provide is essential for these purposes.

In summary, instructors should not only be responsible for the instructional and didactic design of online learning but should also consider strategies that promote interaction in both synchronous and asynchronous sessions. Moreover, the instructional and didactic design should be such that self-regulation, learning skills, self-concept, and academic motivation are developed.

This study's findings are valuable for reflecting on the errors and successes of the return to face-to-face education and how to take advantage of the progress achieved during ERE to favor new, more effective, efficient, and inclusive learning scenarios.

5- Declarations

5-1-Author Contributions

Conceptualization, K.L. and R.C.; methodology, K.L. and F.S.; software, K.L., F.S., and J.M.; validation, K.L., F.S., and J.M.; formal analysis, K.L., R.C-R., F.S., and J.M.; investigation, K.L., R.C-R., F.S., and N.C.; resources, K.L. and F.S.; data curation, K.L., F.S., and J.M.; writing—original draft preparation, K.L., R.C-R., F.S., and J.M.; writing—review and editing, K.L., R.C-R., F.S., and N.C.; visualization, K.L., R.C-R., F.S., J.M., and N.C.; supervision, K.L. and R.C.; project administration, K.L. and R.C.; funding acquisition, K.L. and F.S. All authors have read and agreed to the published version of the manuscript.

5-2-Data Availability Statement

The data presented in this study are available on request from the corresponding author.

5-3-Funding

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5-5-Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki for studies involving humans.

5-6-Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

5-7-Conflicts of Interest

The authors declare that there is no conflict of interests regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

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Appendix I

Informed Consent

We invite you to participate, freely and voluntarily, in a study that Dr. Karla Lobos Peña will execute and that is part of the Fondecyt Research Initiation Project N°11221355 called “Impact of a learning self-regulation web application integrated into the virtual classroom on self-regulated learning, engagement and educational outcomes of university students”

Project title. “Post-pandemic educational experience in college students: learnings and challenges of virtuality.”

Project Description. This project aims to describe the experience of university higher education in the first period of return to face-to-face education after the pandemic to identify critical points and elements of success and failure that could be incorporated in educational policies to favor the adaptation process of students—participation in the study. Your participation consists of freely and voluntarily agreeing to have your responses to the online questionnaire “Post-pandemic educational experience” recorded and analyzed.

Given this free and voluntary nature of participation, you may withdraw from the study at any time without negative consequences for you or the Institution. Your participation in this study is anonymous. The data does not carry any information that could reveal your identity. All information collected and documents associated with this research will be kept in the custody of Dr. Karla Lobos, Responsible researcher of this project. It is worth mentioning that this study does not present identifiable risks to the physical or psychological integrity of the participants. Therefore, there are no costs or economic incentives for your participation in this study. If you have any questions, please contact Dr. Karla Lobos by e-mail at klobosp@gmail.com and by telephone at +56 412204169. The ethical considerations of the project were submitted to the Ethics Committee of the Universidad de Concepción, chaired by Dr. María Andrea Rodríguez Tastets, whose contact number is +56 41 2204302 or e-mail secrevid@udec.cl.

Consent Form

I have read and understood all the information. I agree with the terms for participating in the study “Post-pandemic educational experience in university students: learning and challenges of virtuality”. I understand that my desire to participate or not in the present research is voluntary. I also understand that I may ask additional questions of the study director, the study director, and the researcher at any time during my participation. I asked additional questions about the study director and withdrew from the study without any consequences for me.

Appendix II

My Educative Experience after the 2022 Pandemic

We would like to invite you to participate in the following survey. Your participation is voluntary, and your responses will be kept completely anonymous and confidential. The survey includes 19 questions that will take approximately 5 minutes to complete.

Through this survey, we would like to find out how you have adapted to face-to-face learning after the pandemic. We also want to know if there were any elements of this online learning period that you would like to highlight and retain.

We thank you for your participation!

Regarding your return to face-to-face learning:

Considering that you have been assisting to face-to-face lessons since a few months, you can agree on that:

1. Face-to-face learning is:

- Better than online learning.
- The same as online learning.
- Worse than online learning.

2. My relationship with teachers is:

- Better than online learning.
- The same as online learning.
- Worse than online learning.

3. My relationship with my classmates is:

- Better than online learning.
- The same as online learning.
- Worse than online learning.

4. Collaborative work with my classmates is:

- Better than online learning.
- The same as online learning.
- Worse than online learning.

5. During these few months of face-to-face lessons the most-used learning strategies are:

- Strategies that involve applying something.
- Expositive classes.
- Collaborative (in groups or couples).
- Technology and Communications strategies (videos, infographics, immediate response systems and others).
- Reading (pdf, word or other).
- Research (autonomous search for information).
- Debates.
- Problem solving.
- Simulations.

6. The most common negative emotions that I have experienced during the last few months of face-to-face learning have been:

- Boredom.
- Angst.
- Anxiety.

- Despair.
 - Demotivation.
 - Stress.
 - Frustration.
 - Uncertainty.
 - Inferiority.
 - Irritability.
 - Fear.
 - Pessimism.
 - Sadness.
 - Shame.
7. The most common positive emotions that I have experienced during the last few months of face-to-face learning have been:
- Happiness.
 - Astonishment.
 - Competent.
 - Confidence.
 - Enthusiasm.
 - Gratitude.
 - Optimism.
 - Pride.
 - Patience.
 - Satisfaction.
 - Safety.
 - Tranquility.

Regarding your experience with online learning (during the pandemic):

8. Which learning strategies increased your academic motivation? (Open question)
9. Which learning strategies increased your participation during synchronous sessions? (Open question)
10. Which learning resources or activities you considered to have been effective for your learning process? (Open question)
11. What do you think were the benefits or advantages of online learning? (Open question)

Regarding the last few months of face-to face learning:

12. During face-to-face learning teachers used a virtual classroom:

- Never.
- Almost never.
- Sometimes.
- Almost always.
- Always.

13. During face-to-face classes, teachers used the virtual classroom:

- As a Repository (word, pdf, excel, videos and others).
- To receive homework.
- To send announcements.
- For online assessment.
- To organize and implement group work.
- To replace face-to-face lessons when needed.
- For forum interaction.

- To give online feedback.
- To link external content (URL, apps and other).
- To upload expositive lessons.
- To ask questions with immediate feedback.

14. On a scale of 1 to 5, with 1 being not at all certain and 5 being very certain, how certain do I feel about being successful in this academic year?

- 1.
- 2.
- 3.
- 4.
- 5.

15. If you could choose the learning modality in which your degree will be implemented from now on, that would be:

- Face-to-face learning.
- Online learning.
- Blended learning.

16. Mark the option that most closely matches your opinion:

- I think I will not finish my degree.
- I am almost certain that I will not be able to finish my degree.
- I might finish my degree.
- I am almost certain that I will finish my degree.
- I am certain that I will finish my degree.