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# University Students' Emotions in Forced Remote Education. An Exploratory Study in Spain and Argentina

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## Abstract

In 2020, due to the COVID-19 pandemic, universities had to suddenly and forcefully implement remote education. The study had three objectives: to explore and compare university students' emotions; to analyze the associations between emotions and socio-educational factors; and to understand, from the student's perspective, emotions and experiences lived during remote education. The study was exploratory and comparative. The analyses were quantitative and qualitative. Five hundred and eighty students from the University of Extremadura (Spain) and the University of Río Cuarto (Argentina) participated. Data collection was carried out between May and September 2020. Two data collection instruments were used: self-administered online questionnaire and focus groups. The results indicated concern about connectivity and lack of technological resources. The predominance of negative emotions and communication difficulties was observed in both quantitative and qualitative data. However, we also found flexible and adaptive practices that had allowed students to cope with communication difficulties, and unfavorable emotional states.

## Keywords

Academic emotions, remote education, online learning, university, COVID-19.

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# Emociones de Estudiantes Universitarios en la Educación a Distancia Forzada. Un estudio Exploratorio en España y Argentina

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## Resumen

En 2020, debido a la pandemia de COVID-19, las universidades tuvieron que implementar de manera repentina y contundente la educación remota. El estudio tiene tres objetivos: explorar y comparar las emociones de los estudiantes universitarios; analizar las asociaciones entre emociones y factores socioeducativos; y comprender, desde la perspectiva del alumno, las emociones y vivencias experimentadas durante la educación a distancia. El estudio fue exploratorio y comparativo. Los análisis fueron cuantitativos y cualitativos. Participaron quinientos ochenta estudiantes de la Universidad de Extremadura (España) y la Universidad de Río Cuarto (Argentina). La recolección de datos se realizó entre mayo y septiembre de 2020. Se utilizaron dos instrumentos de recolección de datos: cuestionario en línea autoadministrado y grupos focales. Los resultados indicaron preocupación por la conectividad y la falta de recursos tecnológicos. El predominio de las emociones negativas y las dificultades de comunicación se observó tanto en datos cuantitativos como cualitativos. Sin embargo, también encontramos prácticas flexibles y adaptativas que habían permitido a los estudiantes hacer frente a dificultades de comunicación y estados emocionales desfavorables.

## Palabras clave

Emociones académicas, educación a distancia, aprendizaje en línea, universidad, COVID-19.

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In 2020, the suspension of face-to-face activities at universities was one of the measures adopted due to the health emergency caused by COVID-19. The universities had to implement, in a forced way and without much planning, remote modalities to develop the teaching and learning processes. According to the UNESCO report for Higher Education (UNESCO, 2020), the main concerns of students are internet connectivity, the availability of technological resources, financial problems, difficulties in self-regulating learning, social isolation, lack of communication and general anxiety. The report also notes that the impact of the closure of higher education institutions is greater on incoming students. Likewise, it points out the need to consider the differential impact of confinement measures on students entering higher education, considering socio-economic and gender specificities.

Studies on university education in times of COVID-19 indicated that students prefer face-to-face education to virtual education and manifest negative emotions such as anxiety, stress, anguish and loneliness (Alemany-Arrebola et al., 2020; de la Fuente et al., 2021; Gaeta & Rodriguez, 2021; Fernández-Cruz et al., 2020; Rogowska et al., 2020).

Likewise, digital gaps and communication difficulties between teachers and students are observed (Ardini et al., 2020; Delbon et al., 2020; Expósito & Marsollier, 2020; Roig et al., 2021). Several studies indicate a deepening of educational inequalities according to the social particularities of the students (Diez-Gutierrez & Gajardo-Espinoza, 2020; Gomez et al., 2020; Macchiarola et al., 2020; Pérez et al., 2021; UNESCO, 2020).

In addition to the access gap, it is essential to consider gaps in knowledge and use of technologies in times of COVID-19. Studies prior to the pandemic indicate differences in terms of available knowledge and differential uses of technological artifacts according to the social sector to which the students belong. It has been observed that sectors with more knowledge and economic resources make more varied, diversified and educational uses of technologies (Diez-Gutiérrez & Gajardo-Espinoza, 2020; Van Dijk, 2017). These conditions increase inequalities and alert educators to the importance of not generating educational proposals that widen second-level gaps between "intellectually rich and intellectually poor" (Córica & Urías Murrieta, 2017). In times of pandemic, inequalities regarding uses and knowledge available for quality virtual learning have deepened (Rodicio et al, 2020; UNESCO, 2020). For example, the research by Kardelis, Gómez and Ortí (2021), in which 1,200 young Spanish participated, indicates that the lack of skills is the most widespread problem for continuing studies during the pandemic. According to Segura (2021), the so-called digital divide is constituted from multiple digital inequalities, linked to other social asymmetries of gender, age, place of residence and income level. The author considers that in Argentina there are still strong inequalities in quality and affordable access between provinces, rural and urban areas, and socio-economic levels, and in use and exploitation, especially between genders. Segura (2021) argues that the crisis unleashed by COVID-19 deepens previously existing inequalities, but it also constitutes an opportunity to build progressive, viable and sustainable alternatives over time, and to raise debates on digital rights with a far-reaching social scope.

Studies indicate different emotions and coping strategies between men and women (Alemany-Arrebola et al., 2020; de la Fuente et al., 2020; Lozano et al., 2020; Mac-Ginty et

al., 2021). In the study by Villa, Litago and Fernández (2020), differences are observed in the evaluations of the quality of virtual education according to the year of study of the students. In the present study we proposed three general objectives; the first was to explore and compare academic emotions of university students in the context of remote education due to the COVID-19 pandemic. The second objective was to analyze possible associations between these emotions and socio-educational factors: sex, educational background (undergraduate or graduate; year of completion of the undergraduate degree), previous experience in virtual education, family responsibilities and work activity. The third objective was to understand, from the student's perspective, significant valuations, emotions and experiences lived during remote education processes due to the COVID-19 pandemic.

Considering that experiences in virtual education vary according to the availability of technological resources, knowledge, experiences, pedagogical aids and environmental conditions (Córica & Urías-Murrieta, 2017; Van Dijk, 2017), it is interesting in this research to compare perceptions of students of different geographical locations, in the particular context of the pandemic. Likewise, the interest in comparing perceptions is based on previous studies that indicate variations in educational experiences during the health emergency, according to personal, institutional and contextual conditions (Alemany-Arrebola et al., 2020; de la Fuente et al., 2021; Diez-Gutiérrez & Gajardo-Espinoza, 2020; Gómez et al., 2020; Kardelis et al., 2021; Lozano et al., 2020; Macchiarola et al., 2020; Mac-Ginty et al., 2021; Pérez et al., 2021; Rodicio et al., 2020; UNESCO, 2020). In this sense, we include socio-demographic and educational variables for a better understanding of the object of study.

We define academic emotions as complex constructs that condition student motivation, commitment and performance; communication, classroom climate and general well-being of the educational community (Camacho et al., 2021; Pekrun, 2019). The Control Value Theory of Achievement Emotions (Pekrun, 2014) assumes that educational environments, when they favor the increase of self-efficacy beliefs in the student, promote the activation of emotional states that are beneficial for learning. On the contrary, the learning process is undermined when there is a negative perception of success in performance, since they generate adverse emotional states that negatively influence the process and acquisition of learning. This theory also highlights the relevant role given to the emotions of others and to the interactions that occur in the classroom: the emotions of students and teachers are reciprocally influenced.

In the current complex context of COVID-19, we consider it relevant to analyze academic emotions to build knowledge that contributes to the design of projects and inclusion policies in higher education institutions. As argued by Tang, Chen, Law, Wu, Lau, Guan and Ho (2021) university learning in times of coronavirus is a subject on which much research is not yet known. In this sense, the present exploratory study takes on special relevance to make contributions to the field of higher education.

## **Material and Methods**

We carried out an exploratory and comparative study that integrates quantitative and qualitative analysis.

Considering the classification of mixed research processes by Teddlie and Yu (2007), the present study has a quantitative-qualitative sequential design with sample derivation and integrated analysis. That is, the quantitative and qualitative designs are applied in two moments, the development of one stage leads to the other. Specifically in the present study, the participants of the focus groups derive from the initial sample of subjects to whom the questionnaire was applied. The data collected in the two stages (questionnaires and focus groups) are analyzed separately and then integrated into a joint analysis.

## Participants

Five hundred and eighty students from the University of Extremadura (UEX) in Spain and the University of Río Cuarto (UNRC) in Argentina participated in the study. The universities had been chosen intentionally considering the possibilities of developing the study given the institutional membership of the authors. Both institutions share certain general characteristics: they are public, impart similar degrees, and are located in intermediate cities. For the selection of the participants, a non-probabilistic sampling by opportunity was used, trying to include students of different sexes, ages, and career paths. Likewise, students with different previous experiences in virtuality, with family responsibilities (relatives who are under their care) and with work activities were selected. The UEX sample included 345 students (62% female and 38% male). The ages vary between 18 and 45 years ( $M = 21.5$  years,  $SD = 6.5$ ). The 88% of the sample dedicate exclusively to study (they do not have paid work) and the 95.2% do not have family responsibilities (children or dependents). Regarding previous experience in the online educational modality, 92.2% have never studied online. The 38% of the sample are in first grade, 18% in second, 21% in third grade, 20% in fourth grade, and the 3% are doing postgraduate studies. The UNRC sample included 235 students (86% women and 14% men). The ages range from 18 to 51 years ( $M = 23.6$  years,  $SD = 7.5$ ). The 27.2% of the sample carry out paid work activities and the 12.3% have family responsibilities. The 79% of the students state that it is the first time that they have taken courses virtually. The 23% of the sample are in first year, 20% in second, 22% in third, 8% in fourth, 22% in fifth and 5% are doing postgraduate studies.

## Instruments

We used two data collection instruments: self-administered online questionnaire and focus groups. The questionnaire (García-Perales & Valverde-Berrocso, 2021) included questions that collect socio-educational data (sex, undergraduate or graduate degree, year of study, experience in virtuality, work activity and family responsibilities. They present statements that must be answered on a Likert-type scale from 1 to 10. These statements are divided into four general sections:

- Academic emotions: Emotions about the virtual classroom (13 items) Emotions about online learning and homework (13 items).
- Emotions related to communication and interaction (4 items)

- Emotions related to the learning community (5 items)
- General satisfaction (I would choose virtual education again and recommend this modality to other people).

Finally, an open-choice question was posed in which students can freely express themselves regarding emotions, evaluations, and experiences in remote educational contexts. For the validation of the content of the questionnaire, 7 experts were consulted who corroborated that the items respond to the objectives of the instrument. The consistency studies (Cronbach's alpha) of the Likert scale items indicated acceptable values (UEx  $\alpha = .845$ ; UNRC  $\alpha = .810$ ). García-Perales (2022) presents an exhaustive study of the instrument. The conditions for factorization were verified (KMO=.953, determinant close to zero and Bartlett's Test very highly significant Chi2 value=6095.97; 435 df;  $p < .000001$ ) The exploratory factorial analysis determined the existence of two factors that explain approximately 65.5% of the variability. The factorial analysis indicates two dimensions: positive emotions (report a general state of well-being with the training process, among them trust and security and satisfaction) and negative emotions (adverse states produced by frustration, loneliness, confusion or saturation).

We carried out 10 discussion groups in which 128 students from the UNRC and UEx participated. All the participants in the discussion groups had previously answered the questionnaire on academic emotions in virtuality. The axes of discussion were: positive and negative emotions in times of pandemic, advantages and disadvantages of remote education, meaningful experiences and constructed learning. The development and collection of information from these groups was carried out through virtual meetings on Zoom and Google Meet.

### Data Collection and Analysis Procedure

The questionnaire was presented through virtual classrooms to UEx and UNRC students. The application was carried out between May and September 2020. In the quantitative analyzes (Objectives 1 and 2) we used descriptive statistical procedures and mean differences were analyzed with the non-parametric Mann-Whitney U test (the significance of the test is presented and Z score, that is, the standardized score of U).

For the qualitative analysis (Objective 3), data were retrieved from the open question of the questionnaire and from the textual records of the 10 focus groups. Considering the guidelines of Gibbs (2013), the following qualitative analysis procedures were carried out with Atlas Ti 8: lexical search, selection of hermeneutical units, data coding, memorandum writing and, network construction.

Based on open encodings and constant comparisons, we constructed five categories of analysis to systematize the expressions of the participants: *Blend of emotions*; *Learning in times of COVID-19*; *Teachers and educational proposals*; *Inequalities and gaps*, and *Ratings on remote education*.

Considering the quality of the study, we performed triangulations between methods and between researchers. Likewise, we use communicative validation strategies by consulting the

participating students regarding the analyses and interpretations constructed from the qualitative analysis.

The research was developed considering ethical guidelines for scientific work with people defined by international organizations ([American Psychological Association, 2017](#); [UNESCO, 2019](#)) The participation of the students was voluntary, they were informed about the scope of the research, the confidentiality of the data and the possibility of withdrawing from the process at any time during the study. The participants signed an informed consent before starting the data collection process. At all times the data was treated confidentially, anonymity being presented.

## Results and Discussion

Results and analyzes are presented in an articulated manner, considering the three objectives of the study.

### Exploring Academic Emotions (Objective 1)

Academic emotions about the virtual classroom. There was a notable concern about possible failures of access to Internet, thus manifested by 80.4% of the UEx student and 64% from the UNRC. Already in the virtual classroom, a majority of students indicated having thought about leaving or logging out before completing their tasks (57.7% of the UEx students and 60% of the UNRC). The results also indicated that the students feel lost in the virtual classroom (78.5% of the UEx and 75% of the UNRC). At the close of the session, the results showed that the students perceive a lack of success or well-being, more than half of the students (57.2%) report feelings of frustration. The mean difference tests showed significant results with respect to the perceived frustration at the end of the session in the virtual classroom ( $Z = 6.23, p < .001$ ) and referred to the motivation to continue with the online training ( $Z = 4.93, p < .001$ ). UNRC students are less frustrated and more motivated than UEx students. 75.9% of UEx students and 60% of the UNRC consider that virtual classroom activities are a burden that should be lightened. The Mann-Whitney U test indicates higher mean scores in UEx students on this item ( $Z = 2.4, p < .001$ ).

Emotions about online learning and tasks. A high degree of saturation was observed among the students. Thus, 70% UEx students and 60% UNRC perceived that the information was excessive. The Mann-Whitney U test confirmed significantly higher mean scores in UEx students ( $Z = 8.88, p < .001$ ). In the same way, there was a strong concern about not complete the activities in the time stipulated by the teacher (80% of the UNRC students and 63% of the UEx). 80% of UEx students and 72% of the UNRC showed high levels of stress due to the proximity of the task delivery date. The Mann-Whitney U test showed significant mean differences in this item ( $Z = 3.32, p < .001$ ). 75% of the UNRC students and 73% of the UEx students showed indicators of irritability due to excessive time in front of the screen. However, the students of both universities consider that the materials and resources provided by the teaching staff were adequate and contribute to their training. Regarding the resolution

of activities, the students revealed high levels of self-confidence (85% of the UNRC and 88.4% of the UEx). The interest motivated by the communications (forums, classes, synchronous tutorials) and activities with audiovisuals was high (62.6% in the UEx and 64% in the UNRC).

Emotions about communication in the virtual classroom and learning community. A large part of the students (60%) perceived virtual communication as cold and distant. The data indicated that UNRC students notice greater loneliness due to their physical distance from their peers. The Mann-Whitney U test confirmed this appreciation with significant higher mean scores in the UNRC students ( $Z = 2.4$ ,  $p < .001$ ). Most of the students (65%) felt part of the group. Regarding the taste for active participation in discussion forums, both universities reported low satisfaction rates. 65% of students indicated that they only participate in forums when it is mandatory. Most of the students (60%) feared being misunderstood in virtual classes and forums. Regarding emotions related to group work, students from both universities consider that group activities have worked collaboratively (UNRC = 67% UEx = 62%). UEx students show a greater preference for individual work than UNRC students ( $Z = 3.24$ ,  $p < .001$ ).

General satisfaction with the personal experience as an online student. 65% of UEx students and 55% of the UNRC would not voluntarily choose online education, nor would they recommend it to others. The analyses with the Mann-Whitney U test indicated significant differences between students of the UNRC and the UEx, in the first group higher means were observed in the question referring to whether they would choose virtual education ( $Z = 3.06$ ,  $p < .001$ ) and if they would recommend it ( $Z = 3.82$ ,  $p < .001$ ).

In summary, the results showed an evident concern for connectivity, an essential condition for the development of online education. Similar to Ardini, Barroso and Corzo (2020), students pointed out the intention to abandon virtual classroom and felt lost. Bonomi and Isla (2020), Gómez, Miró, Stratta, Mendoza and Zingaretti (2020) and Macchiarola, Pizzolitto, Solivellas and Muñoz (2020) also found saturation perceptions regarding virtual activities, a situation that generates, in many cases, anxiety, stress and anguish. These sensations can influence or be related to the difficulty shown to manage time, Pérez, Vázquez Atochero and Cambero Rivero (2021) point out that self-management of time, as a competence of self-regulated learning, is a key element in virtuality. Along the same lines, UNESCO (2020) points out those difficulties for self-regulation of learning is one of the main problems observed in universities in pandemic contexts. The nature of the activities determines differences in terms of the commitment and interest of the students, this result coincides with Ardini et al. (2020) who found a greater disposition of students towards audiovisual materials and participation in synchronous communication. Researches about students' perceptions regarding remote education due to COVID-19 coincide in pointing out communication difficulties at both the classroom and institutional levels (Pérez et al., 2021; Roig et al., 2021). The data indicated that the participants would not voluntarily choose the virtual modality, nor would they recommend it. Similar results were found by Ardini et al. (2020) and Villa et al. (2020), who concluded that the majority of university students surveyed prefer face-to-face education and show high levels of dissatisfaction with the virtual teaching modality.



## Academic Emotions and Socio-Educational Factors (Objective 2)

### *Differences in Academic Emotions According to Sex*

Among the most relevant results, statistically significant differences have been observed between men and women in some of the questionnaire items. Significantly higher means are observed in the group of women in the level of self-confidence (UEX  $Z = 2.40$ ,  $p < .001$ ; UNRC  $Z = 3.67$ ,  $p < .001$ ), interest in communication activities (UEX  $Z = 3.89$ ,  $p < .001$ ; UNRC  $Z = 2.43$ ,  $p < .001$ ), interest in activities with audiovisuals (UEX  $Z = 2.79$ ,  $p < .001$ ; UNRC  $Z = 2.48$ ,  $p < .001$ ). The mean of women are also significantly higher than those of men in the following items: *I feel part of the group* (UEX  $Z = 5.12$ ,  $p < .001$ ; UNRC  $Z = 2.67$ ,  $p < .001$ ), *I like to participate actively in the group discussion forums* (UEX  $Z = 4.26$ ,  $p < .001$ ; UNRC  $Z = 2.82$ ,  $p < .001$ ) and *I consider that in my group we work as a team* (UEX  $Z = 4.52$ ,  $p < .001$ ; UNRC  $Z = 3.16$ ,  $p < .001$ ).

### *Emotions, Trajectories and Experiences in Virtuality*

Differences in the scores of undergraduate and graduate students were analyzed. Graduate students assign significantly higher scores on the items referring to voluntary choice (UEX  $Z = 1.93$ ,  $p < .001$ ; UNRC  $Z = 2.95$ ,  $p < .001$ ) and recommendation of online education (UEX  $Z = 1.98$ ,  $p < .001$ ; UNRC  $Z = 2.79$ ,  $p < .001$ ). UEX students assign higher scores on the items: *sometimes I am tempted to leave the virtual classroom* ( $Z = 3.09$ ,  $p < .001$ ), *I perceive that the information is excessive and I feel saturated* ( $Z = 3.02$ ,  $p < .001$ ), *when leaving the virtual classroom I end up with a feeling of frustration* ( $Z = 2.19$ ,  $p < .001$ ). UNRC students assign higher scores on the following items: *I am confident in my ability to study online* ( $Z = 2.64$ ,  $p < .001$ ), *I like the challenge of learning online* ( $Z = 2.37$ ,  $p < .001$ ), *my interest in online reading activities* ( $Z = 2.71$ ,  $p < .001$ ), *I like to actively participate in forums* ( $Z = 2.37$ ,  $p < .001$ ). UNRC students assign higher scores to the items: *there are times when I feel lost* ( $Z = 2.467$ ,  $p < .001$ ) and *I consider that in my group we work as a team* ( $Z = 3.42$ ,  $p < .001$ ). Mean difference studies were conducted between first and last year undergraduate students. In the UNRC, the final year students had significantly higher mean scores in the items referred to voluntary choice ( $Z = 3.86$ ,  $p < .001$ ), recommendation of virtual education ( $Z = 4.01$ ,  $p < .001$ ) and in the items: *I feel that the Materials and resources contribute to my learning* ( $Z = 3.12$ ,  $p < .001$ ), *I am confident in my ability to study online* ( $Z = 2.52$ ,  $p < .001$ ) and *I like the challenge of learning online* ( $Z = -2.68$ ,  $p < .001$ ). In the UEX, the means of the final year students are significantly higher in the item *I have full confidence in my abilities when entering the virtual classroom* ( $Z = 2.30$ ,  $p < .001$ ) and lower in the items *I feel part of the group* ( $Z = 2.31$ ,  $p < .001$ ) and *I consider that in my group we work as a team* ( $Z = 4.15$ ,  $p < .001$ ). Regarding previous experience, in UEX students it is observed that those who have participated in virtual education proposals previously have obtained significantly higher scores in the items that refer to voluntary choice ( $Z = 2.43$ ,  $p < .001$ ) and recommendation of online education ( $Z = 2.00$ ,  $p < .001$ ).

***Emotions, Family Responsibilities and Work***

In the UNRC sample, significant mean differences are observed between those who work and those who do not in the items referring to voluntary choice ( $Z = 2.34$ ,  $p < .001$ ), recommendation ( $Z = 2.81$ ,  $p < .001$ ) and *I am confident in my ability to study online* ( $Z = 2.78$ ,  $p < .001$ ). In the UEx sample, students who work has more confidence in their abilities ( $Z = 3.05$ ,  $p < .001$ ) but more frequently perceives that communication is cold and distant ( $Z = 2.26$ ,  $p < .001$ ). Considering the variable family responsibilities, in the UEx sample, lower mean scores are observed in the items *my learning objectives is one of my main motivations* ( $Z = 2.51$ ,  $p < .001$ ), *I am confident in my ability to studying online* ( $Z = -2.29$ ,  $p < .001$ ), *I feel part of the group* ( $Z = 2.28$ ,  $p < .001$ ) and *I consider that in my group we work as a team* ( $Z = 2.22$ ,  $p < .001$ ), in students who have family responsibilities compared to those who do not. In the UNRC sample, higher scores are observed among those who have family responsibilities in the items referring to voluntary choice ( $Z = 3.09$ ,  $p < .001$ ) and recommendation of online education ( $Z = 2.82$ ,  $p < .001$ ). In the group with family responsibilities, higher mean scores were also observed in the items: *I feel satisfied with my work in the virtual classroom* ( $Z = 2.37$ ,  $p < .001$ ), *I feel motivated to continue my online training when I leave the virtual classroom* ( $Z = 3.40$ ,  $p < .001$ ), *I like the challenge of learning online* ( $Z = 3.68$ ,  $p < .001$ ) and *interest in activities with audiovisuals* ( $Z = 3.38$ ,  $p < .001$ ).

**Table 1**

*Mean, standard deviation and Z test in voluntary choice and recommendation of virtuality according to educational trajectories, previous experiences, work and family responsibilities.*

	Voluntary choice of virtuality		Recommendation virtuality	
	UEx	UNRC	UEx	UNRC
<b>Undergraduate</b>	M=3.44(2.57)	M=4.53 (3.46)	M=3.42(2.53)	M=4.58(3.32)
<b>Graduate</b>	M=5.30(3.12)	M=7.72 (2.14)	M=5.00 (2.58)	M=7.45(1.69)
	Z=1.93*	Z=2.95*	Z=1.98*	Z= 2.79*
<b>First year undergraduate</b>	M=3.75(2.58)	M=3.38(3.29)	M=3.41(2.46)	M=3.22(3.08)
<b>Last year undergraduate</b>	M=3.92(2.70)	M=5.90 (3.12)	M=4.03(2.75)	M=5.67(3.11)
	Z=-.335	Z=3.86*	Z=-1.507	Z = 4.01*
<b>No previous experience</b>	M=3.37(2.52)	M=4.58(3.46)	M=3.37(2.48)	M=4.64(3.33)
<b>With previous experience</b>	M=4.89(3.11)	M=5.06 (3.53)	M=4.59(3.06)	M=5.02(3.25)
	Z=2.43*	Z=-.908	Z=2.00*	Z=-.765

	Voluntary choice of virtuality		Recommendation virtuality	
	UEx	UNRC	UEx	UNRC
<b>No Work</b>	M=3.42(2.52)	M=4.36(3.35)	M=3.39(2.49)	M=4.39(3.28)
<b>Work</b>	M=4.10(3.14)	M= 5.78(3.71)	M=4.03(2.96)	M=5.86(3.21)
	Z=-.947	Z=2.34*	Z=-1.135	Z=2.81*
<b>With family responsibilities</b>	M=4.25 (2.35)	M=6.65(3.48)	M=4.31 (2.46)	M=6.41(3.37)
<b>No family responsibilities</b>	M=3.46 (2.61)	M=4.40 (3.39)	M=3.42 (2.55)	M=4.48(3.24)
	Z=-1.564	Z=3.09*	Z=-1.569	Z=2.82*

\* p < .001

In agreement with de la Fuente, Pachón-Basallo, Santos, Peralta-Sánchez, González-Torres, Artuch-Garde, Paoloni and Gaetha (2021) and Alemany-Arrebola, Rojas-Ruiz, Granda-Vera and Mingorance-Estrada (2020), we observed significant differences according to sex in academic emotions. We observe that women are more interested in audiovisual activities and online communication; they have a higher level of self-demand. Likewise, in women, the importance of the group in virtual education stands out, feeling part of the group, communicating with colleagues and working as a team is more valued by them. The study of Fuente et al., (2021) showed greater persistence and commitment in women, but also greater stress and anxiety. In the case of men, boredom and cynicism, lack of commitment, avoidance and disconnection are observed. It was observed that previous educational trajectories and previous experiences in virtuality make students feel more confident in their abilities and that they value remote education more positively. In this sense, postgraduate students are more predisposed to choose the online modality again and to recommend it to other people. These data correspond to those found by Tang et al., (2021), who concluded that the preparation of students for live online learning varies between different educational levels; graduate students are more successful in virtual classes. Emotions of frustration, saturation, and lack of confidence appear more strongly in first-year students. These data correspond to those presented in the UNESCO Report (2020), highlighting the vulnerability of the groups that entered Higher Education in 2020. Likewise, as in the study by Villa et al. (2020) we observed that the most negative evaluations of the online experience appear in the lower courses. Previous experiences seem to play an important role in academic emotions; UEx students who have participated in virtual educational proposals were more interested in recommending this modality or in choosing it on other occasions. Students who carry out work activities also have greater confidence in their abilities. People who work assign higher scores to the items referring to recommendation and choice of virtual education compared to those who only study. In the UNRC group, those who have family responsibilities seemed to

be more motivated by online learning and education. The data indicated that people who work and / or have family responsibilities recognize potentialities of virtual education. Some difficulties of group integration were also observed, perhaps the organization of time and space for frequent virtual meetings with classmates is not possible for people who work or have family responsibilities.

### **Valuations, Emotions and Significant Experiences (Objective 3)**

Blend of emotions. The qualitative analysis indicated a predominance of negative emotions such as overwhelm, stress and frustration, linked to activity overload. Feelings of anxiety, anguish, helplessness, confusion, demotivation and isolation also appeared. Along the same lines, in the study by Macchiarola et al. (2020) the feelings that students most frequently express were insecurity and anguish.

Gomez et al. (2020) observed that several respondents manifest stress and anguish in the face of this situation of isolation, a feeling of individualism and physical disorders due to the number of hours they have to spend in front of a computer. The students missed physical contact with teachers and classmates, the word distancing appeared very frequently in the expressions of the participants. Some participants considered that the lack of physical contact dehumanizes educational communication with teachers and classmates. The need to be heard appeared as a constant, students perceived distancing, felt loneliness and emphasized the need to consider personal, family, work and health factors. In the study carried out Pérez et al., (2021) students perceived a lack of agreement between teachers and students, and little adaptation to personal circumstances. However, some positive emotions of liking, comfort, tranquility, gratitude, solidarity and companionship appeared, although less frequently, which would indicate processes of adaptation to virtuality. Similarly, in Diez-Gutierrez and Gajardo-Espinoza (2020), the participants have highlighted the need to recognize the emotional situation of students.

The expressions of the participants also indicated that the presence of peers was fundamental in the process of transition from face-to-face to virtuality due to the pandemic. Students emphasized the importance of interaction with classmates both for solving problems related to the development of academic activities and for building virtual bonds to avoid loneliness, isolation and anxiety about confinement. Along the same lines, Lozano, Fernández, Figueredo and Martínez (2020) had also highlighted the importance of students' social capital in times of virtuality due to COVID-19. In sum, qualitative analyzes indicated a predominance of negative emotions among the expressions of the participants. However, some small groups show positive and adaptive emotions in the face of virtuality. In this sense, the results presented by Gaeta, Gaeta and Rodriguez (2020) were of interest, according to the authors the predominant emotions in university students were gratitude, joy and hope, which are linked to self-regulated learning and strategies of coping. In the Argentine case, we visualized a greater diversity of emotions: although negative emotions predominate, expressions such as flexibility, pleasure, comfort, tranquility, gratitude, solidarity and companionship also appear that would indicate processes of adaptation to remote education. Argentines seem to miss physical contact with teachers and classmates; the word distancing appears very frequently in the expressions of the participants. The blend of emotions found in

our study was not only linked to academics, but other family, social, health and economic conditions also come into play. Students also expressed anguish, sadness, and overwhelm over complex personal and family situations such as illness and death of loved ones, job loss, and financial deprivation. Studying academic emotions in times of pandemic involves understanding these complex blends in broader analytical frameworks that recognize the social complexity of the current situation.

Learn in times of covid-19. The virtuality forced by the pandemic had important impacts on the way students learn. As UNESCO (2020) points out, self-regulation of learning and time management is essential to build knowledge in time of COVID-19. Participants posed many difficulties when studying and participating in synchronous and asynchronous activities. Some students commented that they are prepared for online education and do not have confidence in their own abilities. Likewise, time appeared as an important variable, many participants pointed out that they do not arrive in time to solve the tasks, that the number of hours in front of the computer was excessive and that they did not have time to dedicate to other non-academic activities. In the case of the UNRC, we observed processes that imply breaks with traditional forms of learning and search for alternatives to solve problems during online learning. The construction of support networks among students, the accompaniment of some teachers, the solidarity actions between classmates and the search for alternatives to continue learning contributed significantly to the achievement of educational objectives. In some cases, even, Argentine students come to perceive educational advantages of the emergency situation and to value the potentialities of virtuality for future learning. However, Spanish students more frequently pointed out limitations of remote education and expressed fear of the negative consequences in their learning. These data coincide with Pérez et al (2021), who observed that students perceive that virtual teaching requires greater dedication, adequate time management, more discipline and organization. UNESCO (2020) had also pointed out that time management is one of the main concerns of students. Time management is linked to autonomy and the ability to self-regulate actions to learn. Many students argue that they had been left adrift, that teachers did not give enough guidance but only posted remote activities. Students perceived a loss of the learning rhythm; they considered that in virtuality the guidelines are less precise. However, learning in times of COVID-19 not only involves difficulties, we also observed adaptive and resilient practices to face academic challenges, negative emotions and feelings of isolation. Many students had built virtual groups to address these difficulties; they had also generated solidarity practices of resource management and educational materials (scanning of theoretical material, management of shared digital databases, loan of technological resources, etc.). These adaptive and resilient practices had been collected especially in the focus groups, where students describe in detail the actions developed to collaboratively build networks that allow sustaining educational trajectories in difficult times. Along these lines, Zhang et al. (2021), indicated that adaptability (the ability to respond to changes) and student engagement are significantly positively correlated with positive academic emotion and negatively correlated with negative academic emotion. Fernández Cruz, Álvarez Rodríguez, Ávalos Ruiz, Cuevas López, de Barros Camargo, Díaz Rosas, González Castellón, González González, Hernández Fernández, Ibáñez Cubillas and Lizarte Simón (2020) argued that the cognitive strategies

used by the surveyed students have allowed them to face the events derived from the pandemic, compulsory isolation and the closure of the university, certainly adaptive and functional, maintaining a positive perception of your new living and learning situation. In sum, data from our study and previous research indicated that forced virtualization had generated numerous difficulties, but also creative processes linked to the construction of new ways of learning and collaborating with others.

Teachers and educational proposals. Both Spanish and Argentine students realized the importance of interactions between teachers and classmates. Students demanded a greater presence of teachers in educational processes; many argued that teachers, especially in the early stages of remote education, have only dedicated themselves to uploading multiple activities. Students demanded more synchronous encounters and educational guidance on tasks and content. They also requested coordination with other subjects and organization of platforms and technological supports. The profusion and variety of technological supports implemented caused disorganization, causing students to feel overwhelmed by having to navigate through different platforms. As in the study by Ardini et al., (2020), we observed expressions that indicate communication problems and little feedback between teachers and students. Along the same lines, Pérez et al. (2021) recognized two key elements in distance education, one, the interaction (synchronous or asynchronous) between students and teachers; and two, the pedagogical resources used by the latter in remote classes. Based on the qualitative analysis of the students' responses, Diez-Gutierrez and Gajardo-Espinoza (2020) point out criticisms of educational procedures linked to the overload of activities, poor communication with teachers, and inadequate institutional decisions.

The students also pointed out some teacher's difficulties, considering digital competence and the availability of material and symbolic resources to develop remote education proposals. However, beyond the complaints and claims, many students also perceived the efforts made by teachers to give continuity to the teaching and learning processes. Several participants had positively valued the pedagogical proposals and the speed with which the teachers have been solving numerous problems related to the transition from face-to-face to virtual education. Some students also recognized creative teaching practices that have made it possible to solve unexpected problems during the development of virtual proposals. Other studies (Elisondo et al., 2023; Yu et al., 2021) also observed creative practices of teachers to reconfigure their work in a virtual way. Perhaps the evaluations of the students depend on the commitment of each teacher and also on the possibilities of self-regulation of learning. The results found were consistent with the studies of Gómez et al. (2020) and Macchiarola et al. (2020) in which students highlight the importance of the attitude and commitment of teachers in the development of virtual proposals in times of pandemic.

Inequalities and gaps. Qualitative analyzes also revealed deep social inequalities that make remote education difficult for many students. UNRC students expressed greater concern about the availability of connectivity and technological resources. The concern for connectivity expressed by the participants in the first questions of the questionnaire became more visible in the qualitative responses and in the focus groups. Many students reported having connectivity problems, lack of technological resources, and scarce digital skills for academic use. Two of its dimensions had been identified in this study: the digital access gap, understood as the lack of equipment and / or Internet connection; and the digital divide of

use, having sufficient and necessary skills to be informed, communicate, create content, navigate safely and solve problems. Within the digital access gap, the quality and type of the devices determines both the connection conditions and the tasks that can be carried out, so the experience, in this case educational, may be conditioned by the digital media available to students. Socio-economic and geographical aspects can make connection difficult, with the most disadvantaged population sectors and rural areas and / or areas with higher rates of depopulation being those with the least availability of quality access. Numerous studies indicated a lack of connectivity and technological resources necessary for virtual teaching at the university. Likewise, difficulties appeared related to the availability of cognitive, understanding and learning skills with this modality (Diez-Gutierrez & Gajardo-Espinoza 2020; Fardoun et al., 2020; Gómez et al., 2020; Macchiarola et al., 2020; Rodicio et al. 2020). Difficulties related to the organization of time and spaces in the home were also observed. Part of the participating students had returned to their family home, away from their study center and their affective and supportive social network, being forced to share common spaces that may not meet the necessary conditions for optimal performance (personal study space , for example), and / or they must take charge or collaborate in tasks associated with care. Macchiarola et al. (2020) and Gómez et al. (2020) also found difficulties related to the availability of a domestic and social context conducive to virtual education. In the expressions of the participants, problems in accessing family-shared devices, lack of tranquility and time due to caring for relatives or work stand out. The pandemic had only made pre-existing educational inequalities and digital gaps visible, in many cases deepening them. Analyzing the learning processes in times of pandemic is also to recognize inequalities and family, social and economic problems. In pandemic, time, space, connectivity, resources, digital skills and family dynamics make up a complex framework where learning is often not easy.

Ratings on remote education. We found positive and negative evaluations of remote education in times of COVID-19. Positive evaluations appear more frequently in UNRC students. Among the negative evaluations we found: dehumanization, isolation, loneliness, communication difficulties, problems of self-regulation of learning and saturation due to excess tasks. These ratings were linked to quantitative data indicating that the majority of participants would not choose or recommend the online mode. Among the positive evaluations we found: personal time management, compatibility or conciliation with work or other tasks, flexibility, ubiquity and saving money. Some students have stated that the online modality has allowed them to simultaneously develop work activities and care for other people. These data were clearly related to those found in the quantitative study of differences according to work activities and family responsibilities. People who work and / or have dependents assigned higher scores to the items referring to recommendation and voluntary choice. Similar results were found by Macchiarola et al. (2020), many students considered that virtual education allows respecting individual learning times and rhythms and fosters autonomy. In the study by Gómez et al. (2020) the students also recognized advantages of the virtual modality, among which the saving of time and travel costs stands out Ardini et al., (2020) observed the following advantages of online education: according to the current technological development, it contributes to the professional future, less time consumed,

comfort, the ductility of the course times and the agility provided by certain tools. Students perceived strengths and weaknesses depending on personal, work, economic and family situations. The organization of virtual education also seems to condition the perception of strengths and weaknesses. In other words, the opinion of the students, as a subjective construction conditioned by external factors, varies according to different experiences and personal situations. Students who work, those who have to travel to study centers and those with dependents perceived advantages in terms of time management and work-life balance. Students also valued virtual education experiences according to the type of subjects (theoretical or practical), the organization of the course and the commitment of the teachers. Students recognized strengths and weaknesses without disregarding the context of the health emergency, in this sense virtual education is valued as a possibility to continue studying and aspects to improve are also recognized. In other words, virtual education, even with all its flaws and weaknesses, appeared as an option to give continuity to undergraduate and graduate degrees.

### Conclusions

Understanding academic emotions in times of pandemic is a multidimensional problem that transcends education and integrates social, economic, and family conditions. The quantitative and qualitative analyzes shown results that are articulated throughout the study. Concern for connectivity, lack of technological resources and digital skills were conditions that cross all analyzes. The predominance of negative emotions and communication difficulties were observed in both quantitative and qualitative data.

In the comparative analysis, some differences were observed between the UEx and UNRC students. Negative emotions and learning self-regulation difficulties appear more frequently in Spanish students. In the case of Argentines, although negative emotions predominate, some positive emotions and processes of adaptation and self-regulation of learning are observed. In this group, greater economic, connectivity and access to technological resources difficulties were found. In both cases, there are demands for a greater presence of teachers and the need for more fluid interactions with classmates.

As a hypothesis, we propose that the variations in the perceptions of virtual education can be linked to the moment in which the data collection took place, while the Spanish students answered the questionnaire on academic emotions in the first months of isolation; the Argentines did so after five months of confinement. Perhaps negative emotions predominate in Spanish students, considering that at the first moment of isolation, educational proposals were more disorganized and improvised, generating discomfort and uncertainty in educational actors. It remains pending for future studies to analyze institutional, social and cultural particularities of the groups that may have influenced the observed variations.

It is interesting to note that people construct different meanings and evaluations of the forced virtuality experience according to social conditions, previous experiences in remote education and educational trajectories. In other words, it was found that people who work or have dependents recognize the potential of remote education as opportunities to continue their academic training. Likewise, graduate students and those who have had previous



experiences in remote education also identify some advantages and possibilities of this modality.

The analyses showed various complaints from the students about the situation of transition from face-to-face to remote education in universities. However, we have also found flexible, adaptive and creative practices that have allowed students to face learning problems, communication difficulties and unfavorable emotional states. We emphasize the importance of virtual groups of colleagues as supports of the educational and emotional processes. Some expressions of the students reported resilient and supportive practices among classmates. Likewise, some students also underlined the role of teachers in accompanying and guiding learning in these adverse times. The data also indicated unexpected and novel learning linked to new ways of learning and teaching. These learning were linked to digital skills and new forms of group interaction.

As limitations of this study, we point out those referring to the sample, which would be interesting to expand to become more representative, and the time at which the questionnaire was passed. In the same way, knowing the perception and feelings of the teachers, comparing them with those of the students exposed in this study, favors the profiling of the results, the identification of consonances and dissonances between one and the other and the possibility of discovering a clearer panorama of the fact studied here. In future studies, we consider it relevant to analyze, longitudinally, the changes in the teaching-learning processes considering passages from presence to virtuality, from virtuality to *hybrid* or *new presence*. It is also relevant to carry out in-depth studies with particular groups such as people who work, who have dependents and who have financial difficulties to access the necessary resources for online education.

Without ignoring the limitations of the study, we consider that the interpretations made contribute to the understanding of the complex phenomenon of academic emotions in adverse contexts. We emphasize the importance of recovering students' voices. The results found may be relevant for designing and executing educational projects that consider the particularities of the students, the necessary supports and the material conditions essential for educational continuity. The *new normalities* must consider new ways of learning in virtual, face-to-face and hybrid contexts, without ignoring social, economic and health problems deepened by the pandemic. We agreed with Diez-Gutierrez and Gajardo-Espinoza (2020) on the need to recognize the work carried out in the pandemic. It is necessary to design projects that articulate current educational achievements and challenges, recognizing the emotional and social particularities of students. The digital, social and symbolic gaps deepened in the pandemic should be considered in the new educational designs.

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