ISSN. 1815-7696 RNPS 2057 -- MENDIVE Vol. 19 No. 4 (October-December)
Castro Méndez, N.P., Suárez Cretton, X.A., Rivera Olguín, P. "Self-regulation strategies used by university students in virtual environments and academic satisfaction achieved in a pandemic" pp. 1127- 1141
Available from: https://mendive.upr.edu.cu/index.php/MendiveUPR/article/view/2555

2021

MENDIVE
REVISTA DE EDUCACIÓN

Translated from the original in Spanish

Self-regulation strategies used by university students in virtual environments and academic satisfaction achieved in a pandemic

Estrategias de autorregulación usadas por universitarios en entornos virtuales y satisfacción académica alcanzada en pandemia

Estratégias de autorregulação utilizadas por estudantes universitários em ambientes virtuais e satisfação acadêmica alcançada em uma pandemia

Nelson Patricio Castro Méndez[1]
http://orcid.org/0000-0002-7105-6306
Ximena Alejandra Suárez Cretton[1]
http://orcid.org/0000-0001-8204-0548
Patricio Rivera Olguín[1]
http://orcid.org/0000-0001-7309-9847

[1]University "Arturo Prat". Chile.
nelcastr@unap.cl; xsuarez@unap.cl; patririv@unap.cl

Received: May 20th, 2021.
Approved: October 25th, 2021.

ABSTRACT
Current university education requires students who are increasingly self-regulated in their learning and achieve academic satisfaction, especially in the current pandemic conditions where synchronous hours or in front of the teacher have decreased. The objective of this research was to identify the self-regulated learning strategies used by university students and analyze their relationship with academic satisfaction in virtual learning environments. A mixed approach was used, measuring the self-regulation strategies used, academic satisfaction and satisfaction with the virtual experience in 214 university students and then a focus group with 12 students was carried out to deepen the answers. The results showed medium levels of self-regulation, high academic satisfaction and low satisfaction with the virtuality experience; Academic satisfaction can be predicted from self-regulation strategies, but the predictors are different according to the student's experience with virtuality. The importance of preparing strategies to reinforce self-regulation, collaborative work and motivation in the student, as well as feedback from the teacher, particularly in the face of emergency teaching adopted in the context of a health crisis, is concluded.

Keywords: self-regulation strategies; virtual learning experience; academic satisfaction; pandemic.

RESUMEN
La educación universitaria actual requiere de estudiantes cada vez más autorregulados en su aprendizaje y que logren satisfacción académica, especialmente en las condiciones actuales de pandemia, en donde las horas sincrónicas o frente al profesor han disminuido. El objetivo de esta investigación fue identificar las estrategias de aprendizaje autorregulado utilizadas por estudiantes universitarios y analizar su relación con la

satisfacción académica en ambientes virtuales de aprendizaje. Se utilizó un enfoque mixto, midiéndose las estrategias de autorregulación usadas, la satisfacción académica y la satisfacción con la experiencia virtual en 214 estudiantes universitarios y luego se realizó un grupo focal con 12 alumnos, para profundizar en las respuestas. Los resultados mostraron niveles medios en autorregulación, alta satisfacción académica y baja satisfacción con la experiencia de virtualidad; la satisfacción académica se puede predecir a partir de las estrategias de autorregulación, pero los predictores son diferentes según la experiencia con la virtualidad que tenga el estudiante. Se concluye la importancia de preparar estrategias para reforzar la autorregulación, el trabajo colaborativo y la motivación en el estudiante, así como la retroalimentación por parte del profesor, particularmente frente a una enseñanza de emergencia adoptada en el contexto de una crisis sanitaria.

Palabras clave: estrategias de autorregulación; experiencia aprendizaje virtual; satisfacción académica; pandemia.

RESUMO
A educação universitária atual exige que os alunos sejam cada vez mais autorregulados em sua aprendizagem e obtenham satisfação acadêmica, especialmente nas atuais condições pandêmicas, onde as horas síncronas ou na frente do professor diminuíram. O objetivo desta pesquisa foi identificar as estratégias de aprendizagem autorregulada utilizadas por universitários e analisar sua relação com a satisfação acadêmica em ambientes virtuais de aprendizagem. Utilizou-se uma abordagem mista, mensurando as estratégias de autorregulação utilizadas, a satisfação acadêmica e a satisfação com a experiência virtual em 214 universitários e, em seguida, foi realizado um grupo focal com 12 alunos, para aprofundar as respostas. Os resultados mostraram níveis médios de autorregulação, alta satisfação acadêmica e baixa satisfação com a experiência de virtualidade; A satisfação acadêmica pode ser prevista a partir de estratégias de autorregulação, mas os preditores são diferentes de acordo com a experiência do aluno com a virtualidade. Conclui-se a importância da elaboração de estratégias de reforço da autorregulação, do trabalho colaborativo e da motivação do aluno, bem como do feedback do professor, nomeadamente face ao ensino emergencial adotado em contexto de crise de saúde.

Palavras-chave: estratégias de autorregulação; experiência de aprendizagem virtual; satisfação acadêmica; pandemia.

INTRODUCTION

One of the objectives of current Higher Education is for students to become active agents, self-regulators of their own learning. Providing students with the necessary skills to learn independently is considered one of the great challenges of today's university (Cerezo *et al.* 2015) and has constituted an important line of research in recent decades. Self-regulation refers to strategies of learning that students activate when they are working to achieve the goals they have set for themselves. The relevance of the construct of self-regulation is that it allows linking the ways of learning and teaching; higher performing students show better development of self-regulation skills. One of the most influential authors in the development of the concept of self-regulation is Zimmerman (2000). His model, currently, has been used as a theoretical basis to understand learning in virtual environments, due to its emphasis on the contextual component and what this implies in self-regulatory processes. The model is organized in three sequential phases that

provide feedback to the process in a cyclical way. : Foresight, realization and self-reflection. In the first one, the student establishes his objectives and plans the methods that will allow him to achieve them, using his beliefs and interests in it; Then, in the realization phase, it focuses its attention on the task and carries out a self-monitoring on its progress and failures with respect to its objectives; Finally, in the self-reflection phase, he makes personal judgments, makes causal attributions about errors, evaluates himself in his satisfaction achieved, all aspects that will allow him to reorganize himself in relation to the objectives that he initially set. Berridi and Martínez (2017) found that some self-regulation strategies are related to success factors in virtual learning contexts, such as: control, planning and motivational attribution. These authors raise the importance of detecting particular self-regulation strategies in students who learn virtually. It has been seen that students who have greater self-regulation skills show greater academic satisfaction and manage to learn more with less effort (Pintrich, 2000); they show better performance, more initiative to seek help and regulate their efforts to achieve their goals (Daura, 2015). A meta-analysis by Broadbent and Poon (2015) concludes that peer learning achieves a moderate positive correlation with performance in online settings, but the scientific evidence is not robust.

Academic satisfaction derives from the perspective focused on psychological well-being and corresponds to the well-being and enjoyment that the student perceives when carrying out experiences related to his / her role as a student, it is dynamic and depends both on the student's perception and on his / her understanding of the environment of learning (Medrano *et al.*, 2014). Academic satisfaction is important to explain the persistence of the student, as well as their adaptation and academic success (Abarca *et al.*, 2013). The teacher's regulatory teaching together with the student's self-regulated learning produces satisfaction with learning in the Higher Education student (De la Fuente *et al.*, 2017). The pandemic derived from the contagion by COVID-19 has pressured Higher Education institutions to change rapidly from a face-to-face teaching modality to a virtual modality, producing digital access and skills gaps in some students, as well as a great effort of university teachers in order to deliver a quality education (Itati & Bercheñi, 2020).

In addition, the scientific evidence regarding the cognitive-motivational skills that students use in a traditional online education and that results from a careful design and instructional planning of a systematic model does not apply to Emergency Remote Education (ERE), adopted in the context of health crisis It is a temporary change from the delivery of instruction to an alternative mode of delivery, due to crisis circumstances and in which the objective is not to recreate a traditional educational ecosystem, but to provide temporary access to instruction and educational supports in a quick and easy way to install during a crisis (Hodges *et al.*, 2020). This quick approach can lower the quality of the courses taught and lead to dissatisfaction with the virtual teaching experience. For example, the accessibility of learning materials might not be addressed during this type of education; Teachers may have different domains of digital fluency and require different types of support and training to quickly acquire skills.

This creates, at the same time, a great opportunity in the way of understanding teaching and a challenge to rethink it and improve educational practice in virtual environments and in the context of COVID-19, exploring, for example, new teaching methodologies in which the teacher, beyond being an expert in any subject, gains importance in its social dimension and guidance or accompaniment, rather than academic (Polanco & Moré, 2020) .In the pandemic environment, by not having the

presence of the teacher or with synchronous support as an uninterrupted resource, the student's self-regulation strategies acquire greater importance. Likewise, the difficulties experienced in an emergency virtual instruction forced by the health crisis can influence their academic satisfaction (Carhuaz, 2020) and their satisfaction with the virtual learning experience. Regarding the antecedents exposed, the objective of this study focuses on identifying the self-regulated learning strategies used by university students and analyzing their relationship with academic satisfaction in virtual learning environments.

The results obtained in the study will constitute a valuable source of feedback on how students are coping with learning, what self-regulation strategies they are using; which of these are strengths and weaknesses; know their satisfaction towards the teaching modality and verify if the self-regulation learning strategies are related to the satisfaction achieved. This information would help to make immediate changes in teaching to ensure better learning in an emergency educational context. It is important to note that there is no extensive information on this learning experience that can guide university teachers and Higher Education institutions. The results obtained can generate new lines of research regarding the benefits and implications of virtual education for the future.

MATERIALS AND METHODS

The research was carried out with a mixed approach, collecting, mainly, quantitative information through two questionnaires, with the aim of measuring the variables; later, a focus group was carried out with some students who had answered these questionnaires, thus gathering qualitative information, in order to explore and deepen their perceptions regarding the variables measured.

The research design was non-experimental, mainly resorting to a cross-sectional or cross-sectional study of a co relational-causal type to examine the relationship between the variables.

The variables considered in this study were: self-regulation strategies in virtual learning contexts, satisfaction with the virtual experience, and academic satisfaction.

Participants

The study was carried out between August and November 2020, in the context of a COVID-19 pandemic in a public university in southern Chile and considered a population of 635 university students from the careers of Psychology, Nursing and Kinesiology, from the courses from 2nd to 5th year who continued with their studies in the virtual modality. The sample used was non-probabilistic and for convenience and finally reached 33.7% of the population to be studied, being made up of 214 students who answered the questionnaires, whose average age was 23 years.

Instruments

Scale of Self-regulation Strategies in Virtual Learning Contexts. To measure self-regulation strategies in virtual learning contexts, the instrument built in Spanish for this purpose by Berridi and Martínez (2017) and which is based on the learning self-regulation model was used by Zimmerman. The scale structure includes four dimensions: planning and control strategies in virtual learning contexts, motivational attributions in virtual contexts, collaborative work with colleagues and support from the consultant in the tasks. There are 25 items that ask, for example: do I plan my time to attend my online studies?

Is studying online motivating? Am I part of a group of colleagues to support us in our studies? Do I consult with my teacher when I have problems with a task? They answer on a Likert scale of 1 to 5 points that ranges from 1 = almost never, to 5 = almost always, with 3 = middle term. Before its massive application, the word advisor was changed to teacher in the scale and later it was tested in a pilot sample of 30 students, showing adequate behavior without being necessary to adjust. With the total sample, the scale showed adequate reliability and factorial structure, obtaining the following Cronbach alphas: planning and control .91; motivational attribution .88; collaborative work .90; teaching support .84.

Satisfaction with the virtual experience. To measure satisfaction with the virtual experience, an item was added to the previous scale that asked: Has my experience of studying in this distance or virtual modality been, in general, positive? And that it was also answered on the same scale of score 1-5.

Academic Satisfaction Scale. To measure academic satisfaction, the Academic Satisfaction scale adapted and validated for Chilean students by Vergara, Del Valle, Díaz and Pérez (2018) was used. This is a scale based on the perspective of psychological well-being and that understands it as the perception of the well-being and enjoyment of the student in relation to their role as a student. It consists of seven items that ask, for example: Do I enjoy my classes most of the time? Am I excited about the contents transmitted in this subject? Among others, and that are answered on a 7-point likert scale, ranging from 1 = strongly disagree to 7 = strongly agree, with the middle term being 4 = neither agree nor disagree. In the present investigation, this scale obtained adequate reliability, exhibiting a Cronbach's alpha of .93

Focus *group.* In order to know the perceptions and experiences of the students, ten questions were designed for use in a group interview, which addressed issues about self-regulation strategies, academic satisfaction and satisfaction with the virtual experience, for example: have you liked the online education experience? Yes or No and why; what pedagogical strategies or practices help you learn better online? Did you feel competent studying online? What accompaniment, support or feedback did you really need?

Procedure

Ethical considerations. Initially, an informed consent was drawn up in accordance with the guidelines provided by the ethics committee of the Psychology career of the university institution and which guaranteed confidentiality, the use of information for research purposes, free and voluntary participation, explained the objectives of the study, the possibility of leaving the study, among others.

This informed consent and a survey with the instruments already mentioned were made available to all students, to be answered digitally on a platform, within the deadlines already indicated for that purpose. Once answered, they were sent and collected in an Excel data sheet for later analysis with the SPSS v.25 program.

Subsequently, the researchers invited those who had answered the survey to participate freely and voluntarily in an online focus group lasting one hour, which was finally made up of 12 students from different courses and careers; The objective was explained to them, which consisted of exploring and deepening their experience of studying virtually, their degrees of satisfaction and the strategies they were using to self-regulate in this process. One of the researchers posed the questions to the group and led the

discussion, while the other researcher took notes.

Analysis of data

The data analysis strategy consisted of first obtaining the quantitative information of the descriptive variables, frequencies and percentages, means, medians, percentiles, etc., and then investigating the relationships through correlations. Then we proceeded to differentiate two groups: those with high satisfaction with the experience of studying in the distance or virtuality modality and those with low satisfaction with the virtuality experience. Regression analysis was subsequently carried out using the step or step method to predict academic satisfaction from the self-regulation strategies in each of these groups; high and low satisfaction with the virtual experience. Finally, qualitative information was obtained from the focus group by asking questions regarding the same variables of interest, to better understand the quantitative results and the students' perceptions about their experience with virtuality. The researchers conducted a content analysis of the focus group record, and then obtained the conclusions for the study.

RESULTS

It can be observed in table 1 that the students achieved a medium level of self-regulation in the virtual context; half of them were below this average and the other half above it. Although the students obtained a high level of academic satisfaction in 75%, their level of satisfaction with the experience of studying virtually was comparatively lower, reaching a medium grade or slightly lower than the ideal average.

Regarding satisfaction with the experience of studying under this virtual modality, students pointed out the common aspects that they do not like:

> P1 "No, because nobody liked the modality, the internet connection is bad, unstable".
>
> P2 "… I started to have wear and tear on my eyes, I couldn't adapt to the virtual, I needed to underline".
>
> P3 "... it is difficult to deal with the context of the house; with annoying noises ... you have to learn to achieve balance".
>
> Q5 "... at first it was difficult for me to adapt, I need contact with others ... I have not been able to meet my classmates in person ... (student in his second year) is a lot of information (material to read), teachers are not aware of so many things to do".

They also recognized study advantages under this modality:

> P7 "… One can self-manage their times".
>
> Q10 "... I have been able to organize myself to work."
>
> P12 "... at the beginning it was a challenge, a novelty ... I liked it, it is difficult to concentrate, but in the long run learning is achieved".

The form of self-regulation that students resort to most in the current context of virtual teaching-learning (table 1) is by using collaborative work with their classmates; keeping in touch to support each

other, to have a network of studies, share material and solve doubts.

Secondarily, another strategy used is to plan and control oneself regarding tasks and work, the preparation of their materials and respecting their schedules for classes and study. Another strategy they use, but to a lesser degree than the previous one, is to keep in touch and rely on the teacher, the supervision or feedback that they can offer and the guidance they can give to their learning.

Among all of them, self-regulation of one's own motivation is the least used strategy, resulting in a level lower than the ideal average in almost 75% of the students, showing difficulty in managing thoughts and beliefs in the service of sustaining motivation to study in line.

In relation to this point, the students pointed out some of their beliefs:

> P4 "… Honestly no, I have managed to adapt, but I prefer face-to-face, it's better… I tolerate it, but face-to-face would be better. I miss the contact with the professors and colleagues, the resources that the university has as a library and the spaces to study at the University".
>
> P11 "… now the load is greater, it is more difficult. Before, with classes, deeper knowledge was obtained. The chair is missed, it is not enough in such a short time for the teacher ... the learning is not optimal".

Table 1- Self-regulation strategies used, Academic satisfaction and Satisfaction with the virtual experience in students (n = 214)

	Half	Deviation	Median		Percentiles	
		standard		25	fifty	75
Self-regulation in virtuality	3.30	0.75	3.32	2.83	3.32	3.81
Planification and control	3.53	0.86	3.70	2.90	3.70	4.20
Motivational attribution	2.49	1.01	2.20	1.60	2.20	3.20
Collaborative work	3.60	1.10	3.80	2.80	3.80	4.60
Teaching support	3.37	0.92	3.40	2.60	3.40	4.05
Experience satisfaction	2.67	1.32	3.00	1.00	3.00	3.25
Academic satisfaction	5.34	1.31	5.57	4.57	5.57	6.43

Since the results showed that satisfaction with the virtual experience was limited or reduced; it was decided to analyze the use of self-regulation strategies under four different conditions of satisfaction with experience and academic satisfaction. In this way, it was obtained that those with: high academic satisfaction (SA) and high satisfaction with the virtual experience (SE) represented 20.1% of the students; with high SA and low SE 32.2%; with low SA and high SE, 4.7% and with low SA and low SE, 43% of the students.

The graph that follows (figure 1) shows that when satisfaction with the experience is high (24.8% of students), there is a more homogeneous use of self-regulation strategies, while when satisfaction with the experience is low (75.2% of students) the use of these strategies is more heterogeneous and the motivational attribution strategy exhibits the lowest levels. Likewise, the figure shows that the highest values in the use of all self-regulation strategies, except for motivational attribution, occurs when the condition that academic satisfaction is high (52.3% of students).

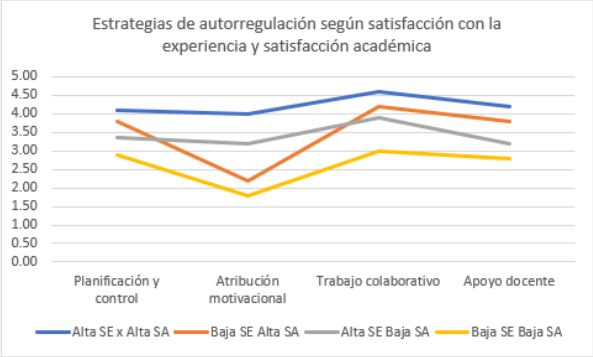

Fig. 1- Graph of self-regulation strategies according to academic satisfaction and satisfaction with the virtual experience in students (n = 214)

It is also observed that students who have a low SE and a low SA (43%) are, at the same time, those students who show lower levels of use in all self-regulation strategies in a virtual context; while students who are highly satisfied, academically and with experience, exhibit greater use of self-regulation strategies.

In order to identify the existing relationships between academic satisfaction and virtual self-regulation strategies, Pearson's correlations were obtained between these variables.

Table 2- Correlations between self-regulation strategies in a virtual context and students' academic satisfaction (n = 214)

	1	2	3	4	5	6
1. Self-regulation in virtuality	-	0.88 **	0.70 **	0.71 **	0.79 **	0.76 **
2. Planning and control			0.49 *	0.49 **	0.56 **	0.60 **
3. Motivational attribution			-	0.27 **	0.51 **	0.56 **
4. Collaborative work				-	0.47 **	0.52 **
5. Teaching support					-	0.72 **
6. Academic satisfaction						-

** p <0.01

It is possible to observe in table 2 that academic satisfaction was significantly related to using self-regulation strategies, in general, in virtual contexts and with each of these strategies in particular, especially with the teacher or teacher support strategy, in the task, with which it shows a greater relationship.

To analyze how the use of self-regulation strategies is related to the academic satisfaction achieved, in each of the groups, that is, in the group with low satisfaction with the virtual experience and in the group with high satisfaction with the experience, they took carried out two regression analyzes with the stepwise or stepwise method, in order to predict which strategies, contribute the most to academic satisfaction, in each of the groups. Table 3 shows the result of this calculation for the condition of low satisfaction with the study experience in virtual modality. It can be seen that teacher support is the variable that most contributed to predicting academic satisfaction, contributing 44.6% to the explained variance. By progressively adding the other variables, it is possible to observe that said percentage increases to 50.7% with the planning and control strategy; it reaches 53.8% when adding the motivational attribution and finally 55.9% when adding the collaborative work variable. In this way, the academic satisfaction achieved by students with low satisfaction with the virtual experience can be predicted by approximately 56% from the strategies that students use.

Table 3- Prediction of academic satisfaction in students (n = 161) with low satisfaction with the virtual experience

Variable	βeta				IC 95 %
	Step 1	Step 2	Step 3	Step 4	
Teaching support	0,671**	0,519**	0,478**	0,424**	[0,62, 1,16]
Planification and control		0,293**	0,244**	0,185**	[0,06, 0,34]
Motivational attribution			0,201**	0,202**	[0,23, 0,80]
Collaborative work				0,181*	[0,09, 0,51]
R2	0,446	0,507	0,538	0,559	
F	129,4**	83,15**	63,13**	51,70**	
ΔR2	0,450	0,063	0,034	0,023	
ΔF	129,4**	20,46**	11,77**	8,43**	

* p <0.05; ** p <0.01

Table 4 allows us to observe that, in the condition of high satisfaction with the experience, only three are the strategies that were most relevant to the prediction of academic satisfaction. Teaching support is once again the variable that contributes the most to the prediction, but in this case only in 35.4% of the explained variance. Subsequently, an inversion is observed in the order of importance of the second and third variables; In this case, the collaborative work strategy is more important for prediction than motivational attribution. By integrating the three variables, 45.1% of academic satisfaction is predicted, in this condition of high satisfaction with the experience.

Table 4- Prediction of academic satisfaction in students (n = 53) with high satisfaction with the virtual experience

Variable	βeta			IC 95%
	Paso 1	Paso 2	Paso 3	
Teaching support	0,606**	0,522**	0,186**	[0,32, 1,01]
Collaborative work		0,275*	0,286*	[0,07, 0,53]
Motivational attribution			0,234*	[0,01, 0,61]
R2	0,354	0,413	0,451	
F	29,54**	19,29**	15,24**	
ΔR2	.367	.069	.047	
ΔF	29.54**	6.09*	4.46*	

* p <0.05; ** p <0.01

In both cases, academic satisfaction is mainly explained by teacher support, but when satisfaction with the experience is low, the use of planning and control for academic satisfaction becomes more relevant, while when there is high satisfaction with the experience it charges more importance the collaborative work with colleagues.

DISCUSSION

The objective of this research was focused on recognizing the self-regulated learning strategies used by university students under virtual learning environments and analyzing their relationship with the academic satisfaction achieved, in the context of the pandemic.

This study showed that half of the students manage to self-regulate in virtual learning contexts, at a medium or higher level and that the rest have many difficulties in learning independently. It was also observed that students report adequate academic satisfaction in 75% of the cases, a concept that mainly refers to compliance with the subjects carried out, with no coincidence with

what is proposed by Carhuaz, (2020), even though half of the students have an unsatisfactory experience with learning under the modality of virtuality.

The most widely used strategy, in all cases, is collaborative work with colleagues and that this contributes significantly to the academic satisfaction achieved, regardless of the degree of satisfaction that the student has with the personal experience of studying under this virtual modality contributing to achieve a better performance in the student, according to Broadbent and Poon (2015) and through this to their academic satisfaction.

It also revealed that the degree of use of the strategies to which students mainly resort is different, in relation to the levels of satisfaction with the virtuality experience and academic satisfaction that they exhibit. The results suggest that minimum or minimum conditions would be required of a certain standard so that the self-regulation cycle works homogeneously. These conditions, for example, connectivity, space to study or others will affect the level of satisfaction with the experience that the student achieves. If this does not happen, the results show that the main strategy that is affected is that of motivational attribution. In this study, only a low percentage (20.1%) managed to adapt successfully, achieving high academic satisfaction and with the virtuality experience, frequently using all these self-regulation strategies. Probably, the abrupt change from a face-to-face teaching modality to an emergency virtual one (ERE), noted by Hodges *et al.* (2020), did not grant enough time for the preparation of materials, for induction processes to new tools, to tutorials to approach technology, to platforms, generating disagreement with the teaching modality and where the teacher was not able to select and train effective strategies (Hodges *et al.*, 2020; Itati & Bercheni, 2020). It has been seen that students who have greater self-regulation skills show greater academic satisfaction and manage to learn more with less effort (Pintrich, 2000) and that they show better performance; However, the present study relativizes these conclusions due to the fact that a high satisfaction with the virtual experience is associated, as can be seen in Figure 1, with a high use of all self-regulation strategies, regardless of whether the academic satisfaction condition is high or low.

In all cases, the strategy least used by students is that of motivational attribution, which is to be expected from the digital access and skills gaps found by Itati and Bercheñi (2020), which are produced by the pandemic and which put pressure on students to make a great effort to adapt quickly to this new modality. A large number of students indicate in the focus group that they have not been able to adapt, that they prefer face-to-face, that they miss contact with teachers and peers, that now the load is greater, more difficult and that learning is not optimal.

This low motivational attribution would affect the self-regulation cycle of the student, leaving him more exposed to negative reactions and less commitment to academic work, since according to the model of Zimmerman (2000), it is in the self-reflection phase where the learner recurs. To personal judgments, he makes causal attributions about errors, evaluates himself in his satisfaction achieved and increases his intrinsic interest in the task. In virtual teaching, the social dimension and the orientation or accompaniment of the teacher becomes more important than the academic one (Polanco & Moré, 2020). However, the time of direct contact is scarce and interrupted with the teacher, therefore, the work of accompaniment and emotional or motivational support by the teacher occurs only partially. In particular, a more personalized and differentiated treatment towards certain groups of students is more fundamental towards those who present the

lowest motivational attribution, which at the same time exhibit the lowest levels of use of the other self-regulation strategies and the lowest levels of academic satisfaction and with the experience of virtuality. A group of no less than 43% of the students presented this condition in this study.

The teaching support in the task is the most important factor to achieve academic satisfaction in the student, regardless of the level of satisfaction with the virtual experience that the student has. Secondly, for those students with low satisfaction with the experience of virtuality, it is planning and control that allows them to improve their academic satisfaction; while for the other group it is collaborative work that increases it. It is interesting to note that the results showed that collaborative work is the strategy most used by all students. Consequently, the group with the highest satisfaction with the experience will benefit more from the use of this strategy than the other group. This result is consistent with Daura (2015), who points out that the more self-regulated students have more initiative to seek help and regulate their efforts to achieve their goals, since in this research student with greater satisfaction with the virtual experience exhibit more homogeneous or regular use in self-regulation strategies than the other group.

Although Berridi and Martínez (2017) found that some self-regulation strategies such as: control, planning and motivational attribution are significantly related to performance factors in virtual learning contexts, but not teacher support, the present research shows that, when trying to understand More extensively, the success factors that contribute to improving the academic experience of the student, the support of the teacher in the task acquires relevance. This finding is especially important in the pandemic environment because, by not having the presence of the teacher or with Few hours of synchronous support as an uninterrupted resource, the self-regulation strategies that the student deploys acquire greater importance. In this sense, by reducing interactions with the teacher, students can seek alternatives that are more available, such as peers, for help increasing the importance of peer learning in online environments.

This research shows how students are coping with learning; the self-regulation strategies they are using and also allows us to know their satisfaction with this teaching modality. The opinions of the students in this study reflect the difficulties they are facing to achieve balance and reconcile the study with the family, anxiety due to academic overload and the need to develop self-care strategies, as well as insecurity regarding whether they are learning or not, regarding the quality of learning; Likewise, the need to have more immediate feedback from the teacher, who is often not asked because they fear interrupting or invading their personal space. These findings provide guidance on where to make immediate changes in teaching to guarantee better learning in an emergency educational context. The university must provide support and accompaniment so that satisfaction with the experience improves; such as teaching in organizational strategies, tutorials to face some possible difficulties that may arise in some students or small self-regulation courses that prepare students before starting their subjects. The possibilities of pedagogical strategies for this purpose are diverse; such as resorting to flipped class, project learning, problem-based learning, among others, that favor the development of autonomous learning skills in students (De la Fuente *et al.*, 2017). In the same way, it must be verified if the student has the minimum computer equipment, stability and speed of connection, among others, that allow better satisfaction with the virtual learning experience. In this sense, the active role of the teacher is not only important in academics, it is also important in the socio-emotional support that it can

provide to the group of students who experience dissatisfaction with virtuality or less academic satisfaction. The emergency seems to be: to promote the use of teaching strategies that reinforce self-regulation, collaborative work among peers, but also make visible the teaching role of emitter of constant feedback. In this way, it could be contributing to the achievement of a better performance and increasing motivation towards online teaching. In addition, this study highlights the support that must be given to teamwork or with peers, since in this way students learn better, they reinforce social interaction and this contributes to motivation and satisfaction with the academic experience. This result constitutes an important finding to be investigated, since it is presented as one of the most used strategies in virtual teaching. The subjective experience of the students qualifies it as an important motivational factor.

Among the limitations of this research is the use of an information collection instrument designed to evaluate virtual self-regulation strategies, not in emergency contexts, and the fact that satisfaction with the experience of virtuality was handled as an ordinal dichotomous condition of high or low satisfaction. The importance that emerges in the study of this variable makes it advisable to investigate it further, measuring it directly and specifically as a continuous variable or at least studying its effect on the use of self-regulation strategies and differentiating its impact on these strategies in relation to that achieved by the academic satisfaction. Future research could explore this last aspect mentioned and, with even more delay, the contextual aspects or conditions associated with an unsatisfactory experience in virtuality as social, personal or physical environment elements; likewise, the minimum conditions for the self-regulation cycle of learning in virtuality it works homogeneously or adequately.

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Conflict of interest:

Authors declare not to have any conflicts of interest.

Authors´ Contribution:

The authors have participated in the writing of the work and analysis of the documents.