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Explanatory factors of student perception of the online educational experience[1]

Factores explicativos de la percepción estudiantil en la experiencia educativa en línea

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Abstract

The aim of this study was to identify some factors that influence how students perceive their educational experience with online learning. The sample consisted of 150 university students, with a mean age of 32.48 years. Three instruments were used, which have demonstrated adequate reliability and validity for their scores in university populations: the Self-Regulated learning scale, the Academic stress questionnaire, and the Questionnaire on perception of educational experience in online mode. Data were analyzed using descriptive statistics, bivariate correlations (Pearson's product-moment coefficient), and a multiple linear regression model. Results showed significant associations between age, academic

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stress, and self-regulation, with the perception of the online educational experience. The model suggested that age and academic self-regulation patterns were significant predictors of the perceived online educational experience, while academic stress did not appear to be related to this variable. The study emphasizes the importance of understanding the factors that impact perceptions of online university education, to improve virtual education, and consider the specific characteristics of each course and variables associated with students' internal processes, such as self-efficacy and technological competencies.

Keywords: distance education, perception, learning processes, academic stress variables.

Resumen

El objetivo de este estudio fue identificar algunos factores que influyen en cómo los estudiantes perciben su experiencia educativa con el aprendizaje en línea. La muestra consistió en 150 estudiantes universitarios, con una edad media de 32,48 años. Se emplearon tres instrumentos cuyos puntajes fueron validados en poblaciones universitarias, con confiabilidad adecuada reportada: la Escala de aprendizaje autorregulado, el Cuestionario de estrés académico y el Cuestionario sobre percepción de la experiencia educativa en modalidad en línea. Los datos se analizaron mediante

estadísticos descriptivos, correlaciones bivariadas (coeficiente producto-momento de Pearson) y un modelo de regresión lineal múltiple. Los resultados mostraron asociaciones significativas entre la edad, el estrés académico y la autorregulación, con la percepción de la experiencia educativa en línea. El modelo sugirió que la edad y los patrones de autorregulación académica fueron predictores significativos de la experiencia educativa en línea percibida, mientras que el estrés académico no pareció estar relacionado con esta variable. El estudio enfatiza la importancia de comprender los factores que impactan en las percepciones de la educación universitaria en línea, para mejorar la educación virtual, y considerar las características específicas de cada curso y variables asociadas con los procesos internos de los estudiantes, como la autoeficacia y las competencias tecnológicas.

Palabras clave: educación a distancia, percepción, procesos de aprendizaje, variables de estrés.

I. Introduction

The world as we knew it has changed after the health emergency caused by the SARS-CoV-2 virus that led to the implementation of certain measures including confinement, prompting the use of technologies in all areas of society. Education was one of the areas which quickly applied such technologies to all educational levels, with the intention of assisting the population that made use of their services, even though for some this meant an abrupt change that was characterized by improvisation, due to the lack of time to properly adapt and prepare in the rush of the moment (Torres & Monge, 2023).

Before the pandemic, the incorporation of technologies for online education had already achieved important advances, among others, the following: the increase in distance and blended learning offerings, the creation of massive open courses regardless of time, nationality or language, and the use of learning management systems (LMS) that are increasingly accessible, flexible, modern and personalized.

Every advance in online education should aim to overcome geographical and time barriers while promoting inclusion, without neglecting the quality of teaching-learning processes. As Meza et al. (2023) highlight, such progress requires clear criteria to ensure educational relevance. However, it is not an easy task because, as mentioned by Suárez-Guerrero et al. (2023), there are several myths or even exaggerations that convey an incorrect idea,

although accepted and disseminated, about the benefits of online education and the incorporation of technologies in teaching and learning.

Even though information and communication technologies (ICT) incorporate a wide range of innovative elements to serve education and meaningful learning, providing tools that contribute to the management of the teaching-learning process, their use also requires evaluating new ways of conceiving it. These approaches are analyzed through the convergence of various theories about nature and context of learning, and they often assign significant importance to psychological factors within the teaching process, to achieve the development of autonomous learning in students, as proposed by Villegas et al. (2019).

Among the psychological factors that typically intervene in the teaching and learning process—for both teachers and students—those that enable guidance and training to create the most suitable connection in this process when using technologies must be considered. In some cases, insecurity, stress (mainly due to a lack of knowledge), or lack of planning, organization, motivation, or interest, due to past negative experiences, become obstacles (Fernández-Batanero et al., 2021).

Part of the educational challenge lies in reducing the gap between the rapid technological evolution and the lack of preparation of many teachers and students to use it effectively. For this reason, although technology is necessary nowadays, it is not sufficient on its own to meet the needs arising from education. An adequate combination of technological resources with

clear quality criteria is important to ensure that the online experience can be truly enjoyed.

Regarding the quality of online education, some authors have opted for the measurement of the students' perceptions of their online experience as one of the criteria for establishing clear judgements, since, as "customers", their perceptions and opinions become key for the continuity, evaluation and necessary improvements in a non-classroom educational process mediated by technologies. Olivera (2020) assures that the quality of teaching can be measured through the perception of student satisfaction, based on their experiences as users, since they are able to rate the service, they receive and judge their own performance and learning.

Student perception has been examined in various research studies, where the need to investigate different factors, both student and the course itself, has been affirmed. It has also been approached from the point of view of the students' satisfaction with their online experience, defined by Zambrano (2016) as "the degree of congruence between students' previous expectations and the results obtained, with respect to the experience of learning through virtual courses" (p. 16). This author found that the instructor's attitude towards online learning and the flexibility of the course are the strongest predictors of student satisfaction.

As for other factors that may mediate between the perception of expectations and outcomes, it has been found that students feel satisfied if they perceive that there is personalization, flexibility, interaction, mobility, satisfaction and

motivation (Humanante-Ramos et al., 2019). Another important factor is students' use and acceptance of technology (Sholikah & Sutirman, 2020). They also value having the support of their teachers (effective accompaniment) and an appropriate teaching methodology, together with accessible and reliable virtual infrastructure (Olivera, 2020).

In addition, Díaz-Camacho et al. (2021), after reviewing 50 publications on the perception of satisfaction with the online educational experience, find that among the most determining factors for its negative assessment are, among others: the impossibility of student participation, feeling low self-efficacy, and motivation for the use of digital technologies, perceiving that performance is not as expected, failure to timely communicate with the teacher, even poor feedback from the teacher or failure to send material on time, the use of unfriendly platforms and not having experience in virtual courses.

A literature review on the subject by Asalde and Cárdenas (2022) also agrees that to identify student satisfaction in the virtual modality, it is important to consider the teacher's skills, virtual accompaniment and feedback. Similarly, Castellano et al. (2021) and Uribe et al. (2023) in their study on students' perception of online classes confirm that the teacher who plays a flexible and empathetic role towards students contributes to a positive or non-negative opinion of the experience.

The results together with those of Díaz-Camacho et al. (2021) coincide with the conclusions of Manrique and Sánchez (2019), who found that students value their educational experience as a negative one when there is an

excess of tasks, unfriendly platforms, little feedback from the teacher, poor quality content and lack of practicality.

According to Segovia-García and Said-Hung (2021), it is not advisable to compare between different types of learning experiences, as there are internal and external factors that influence student satisfaction from one course to another. Those include whether there is a robust technological infrastructure (average speed and latency rate of the internet) in the country or geographical area, and the duration of the learning process (short courses, full online degrees, or long-term courses). For example, the study by Canova-Barrios et al. (2023) confirmed that students who perceived their online education experience positively were those with children, those who were older, those who had more time to connect and those who reported no connectivity difficulties.

As can be seen, the study of student perception of online educational experience is an issue that responds to multiple factors, including convenience, effectiveness, competence, motivation, satisfaction, communication, and preference. In addition, students have ways of coping with academic demands, and particularly when it comes to online educational experiences, how the use of self-regulation strategies or coping with academic stress may be related to satisfaction.

I. Factors influencing the perception of online experience

Requena (2020) states that when it comes to virtual environments, students have particular and greater demands for self-regulation, i.e. before, during

and after the learning process, they must control those aspects that are susceptible to it, to have an effective learning process. Garzón and Organista (2021) recognize that when it comes to online learning, students require greater metacognitive tools to define their learning goals, manage their time, make decisions, select strategies according to the academic demand, plan, monitor and make changes in their own process, therefore, they are located at certain levels of self-regulation.

Mora et al. (2020) state that online learning requires the implementation of habits and strategies for autonomous learning and conclude that there is a relationship between self-regulation processes (motivation, self-efficacy, self-concept) and a good performance, as opposed to those who do not have them. Similarly, according to Machuca et al. (2021), the effectiveness of online learning is positively correlated with self-regulated learning in virtual contexts, thus confirming the hypothesis that students need to develop good habits of self-regulation of their learning, in order to be successful in their learning in the virtual modality, and teachers need to observe the cognitive, metacognitive, affective and behavioural processes of their students in order to provide the necessary corrective measures.

Makhno et al. (2022), after comparing self-regulation patterns between two groups participating in online courses (MOOCs and another using technology but with teacher support), identified that there was an average positive relationship between students' success and their self-regulation. Similarly, the study by Almoslamani (2022) agrees on the benefits of applying

self-regulation strategies and adds that a higher level of self-regulation fosters openness and acceptance of the online experience. This is confirmed by Torres and Monge (2023) who note that students perceived participatory teaching and learning methodologies more positively and which stimulated active learning.

Similarly, Cobo-Rendón et al. (2022) confirm that satisfaction with the online experience is associated with self-regulated learning, specifying that students who use self-regulated learning strategies (managing time, preparing the environment for learning, making themselves available for studying, monitoring the process, and evaluating it), find it easier to participate in online learning experiences. However, despite the benefits of self-regulation, Castro et al. (2021) warn that not all students manage to self-regulate in virtual learning contexts, which is why they manifest various difficulties in learning autonomously.

Another aspect related to the perception of the online experience and self-regulation is academic stress. According to Chávez et al. (2021), stress arises when there is no balance between the demand and the ability to cope with it, causing a series of responses at the endocrine, immunological, emotional, and behavioural levels when the individual perceives threats or danger.

Chávez et al. (2021) also consider that stress in the academic environment can occur in two ways; one related to difficult and distressing situations in which the student feels that he/she is not in control, among these are:

number of subjects to be taken, difficulty of teaching assignments, fairness in the teacher's evaluation and the impossibility of receiving personalized attention when being in a large virtual course. The other form of stress is when it drives the student to work independently and self-regulated to achieve positive results.

Likewise, García and González (2022) found in the sample of their study that academic self-regulation strategies were related to coping strategies, while procrastination and delaying activities were related to stress. According to the authors, those students who felt stressed by activities, delayed their completion and delivery, completing only those activities they found enjoyable. Dávila et al. (2022) also confirmed in their study that academic procrastination can contribute to academic stress.

Salinas et al. (2022) set out to describe the students' perception of their role in virtuality and how this influenced their emotions and feelings and found that 50% of the surveyed population reported having feelings of frustration, sadness, anger, and stress due to the implementation of the virtual modality during the pandemic. The researchers recognize that the capacity for self-management, discipline, collaborative work, and self-learning are characteristics that allow the student to cope successfully with virtual learning, and that it is important for students to be aware of this.

On the other hand, Moawad's study (2020) found that those students with higher levels of stress were related to the uncertainty of end-of-term online exams and evaluations. The research by Santana et al. (2022) concluded

that 67.9% of the participants reported considerable stress levels, and that these were since the abrupt changes to the virtual modality resulted in sleeping difficulties and mental health problems, mainly due to rejection of change and fear of failure. Finally, in the findings of Dávila et al. (2022) the study recognized that the more teachers have more digital and pedagogical skills to teach virtual classes, the lower the academic stress in students. Therefore, stressful situations can come from different factors.

Santana et al. (2022) recognizes that in stressful situations individuals' resort to the use of coping strategies, which are considered adaptive actions, and it is expected that the higher the coping strategies, the lower the level of stress should be. Their study also found that, according to the students' opinion, only 18.8% of the teachers provided strategies for coping with stress, which included recommendations and strategies for online learning. The authors recognize that the teacher has a fundamental role in generating stress triggers and promoting protective behaviours.

In investigating more directly about stress and satisfaction with online experience, Cofini et al. (2022) in their study conducted during the pandemic with students at an Italian university, found that higher stress scores were related to lower satisfaction scores, and stated that having positive coping strategies could contribute to reducing stress. Additionally, in this study satisfaction was not related to gender, but did increase with age. In contrast, in the findings of Ramírez-Gil et al. (2022), men presented lower levels of

self-regulation, problems due to the use of social networks, and stress levels, compared to women.

Some relationships with stress and perception of online classes are inconclusive and require further research. Therefore, the goal of this research is to identify some of the key student factors that influence the perception of their online learning experience. Among those factors are variables such as academic stress, age, and academic self-regulation patterns.

II. Method

2.1. Participants

This descriptive-correlational and non-experimental research used a non-probabilistic convenience sample of 150 university students, 135 women and 15 men, with an average age of 32.8 years. All participants were enrolled in online university education programs offered by Spanish institutions, and could reside in any region of the country due to the non-face-to-face nature of their studies. They were contacted through institutional emails, where the highest rate of voluntary response was among women.

2.2. Instruments

Self-regulated learning scale (SRLS). This is a self-report instrument that assesses patterns of self-regulated learning. It was designed and validate by Elvira-Valdés and Pujol (2015) and consists of 18 items grouped into four dimensions: self-efficacy, goal orientation, strategy use, and self-evaluation. The response scale is Likert-type with five options, ranging from "Strongly

Disagree" to "Strongly Agree". The total score ranges from 18 (low level of self-regulation) to 108 points (high level of self-regulation). To validate the scale, the authors employed a sample of 402 students, and content validity was ensured through a panel of 5 experts in Psychology and Education, who evaluated the theoretical correspondence of the items. Exploratory factor analysis showed adequate sampling (KMO = 0.856), and a factor structure aligned with the theoretical dimensions. Reliability was assessed using Cronbach's alpha coefficient, obtaining a value of α = .788 for the entire instrument, and then for each of the dimensions: self-efficacy (α = 0.771), strategy use (α = 0.733), self-evaluation (α = 0.709), and goal orientation (α = 0.675), values considered appropriate for exploratory contexts (Nunnally & Bernstein, 1995). The overall scale score reflects the level of academic self-regulation, with higher scores indicating greater self-regulation.

Academic stress questionnaire. The questionnaire was developed by de Pablo et al. (2002) to assess the level of academic stress in university students using self-report. The questionnaire consists of 15 questions and students are asked to rate their level of stress on a 10-point scale, ranging from "Not at all stressful" (0) to "Very stressful" (10). During the instrument validation process, the authors ensured content validity through expert review by psychologists, who verified the theoretical correspondence of the items. An exploratory factor analysis supported the theoretical structure of the construct, explaining 62% of the total variance. Reliability was verified using Cronbach's alpha, with a value of α = 0.788 in a Spanish sample,

meeting the psychometric criteria for applied studies (AERA et al., 2018). Results are calculated by summing the scores for each question, indicating the level of academic stress experienced by the student during the four weeks prior to completing the questionnaire. As the total score increases, so does the level of stress perceive by the student.

Questionnaire on perception of the online learning experience. A questionnaire was also administered reporting on students' perceptions of 7 aspects of their online experience: convenience, effectiveness, competence, motivation, satisfaction, communication, and preference. This instrument is answered on a 5-point Likert scale, ranging from 1 (total disagreement) to 5 (total agreement), where the higher the score, the better the perception of the online experience. The items were evaluated by 4 experts in Education experienced in online modalities, and the exploratory factor analysis identified a 7-dimension structure explaining 68% of the total variance, aligning with the proposed theoretical categories (AERA et al., 2018). The Cronbach's alpha for the overall scale was $\alpha = .82$. The global score reflects the comprehensive perception of the online experience, with higher scores indicating greater satisfaction with the virtual modality.

2.3. Procedure

The application of the instruments was carried out through the Google Forms platform, which provided data collection and ensured the confidentiality and anonymity of the participants (Google LLC, 2024). The study was approved by the Ethics Committee of Udima, complying with the corresponding

regulations. Likewise, all participants were informed about the objective of the study and their informed consent was requested before completing the instruments, so that participation was voluntary, respecting the will to participate or not to participate, and without putting the physical and moral integrity of the persons at risk.

2.4. Data analysis

The data collected in this study were analysed using the statistical package SPSS (v.23), to respond to the proposed objective. Firstly, descriptive analyses were implemented, which showed the fundamental features of the study variables (age, academic stress, self-regulation patterns and educational perception), as well as the distribution behaviour and data trends. Secondly, given the nature of this study, correlational analyses were carried out to examine the relationships observed between the factors considered and the students' perception of their educational experience. Finally, linear regression analysis showed a model to address and explain the influence of the research variables on students' perception of the online environment.

III. Results

Table 1 shows the descriptive results of the variables, calculated using summed scales for each construct (see the section on instruments). As can be seen, the mean age is 32.84 years, with a standard deviation of 7.502. The age distribution appears to be relatively normal, as skewness is positive (.627), and kurtosis is negative (-.595). As for academic self-regulation

patterns, the mean is 74.89 with a standard deviation of 7.135. Distribution appears to be slightly skewed to the left, as skewness is negative (-.203), although kurtosis is close to zero (-.179).

Table 1. Descriptive variables

Statistic	Age	Academic self-regulation	Academic stress	Educational perception
Minimum	22	55	51	16
Maximum	55	90	131	40
Average	32.84	74.89	94.4	28.91
Typical deviation	7.02	7.135	16.433	6.35
Asymmetry	.627	-.203	-.295	-.124
Kurtosis	-.595	-.179	-.269	-.842

Academic stress has a mean of 94.40, with a standard deviation of 16.433. Distribution appears to be quite skewed to the left, as skewness is negative (-.295) and kurtosis is close to zero (-.269). Distribution appears to be relatively normal, as skewness is close to zero (-.124) and kurtosis is negative (-.842).

Table 2 shows the bivariate correlations between the variables of academic self-regulation, academic stress, educational perception, and age. The correlation between age and perceived online educational experience is positive and moderate (r = .289, p < .01), suggesting that as age increases, perceived online educational experience also tends to be more positive. The relationship between patterns of academic self-regulation and perception of online educational experience is positive and moderate (r = .375, p < .01), indicating that students who have stronger patterns of academic self-

regulation also tend to have a more positive perception of online educational experience.

Table 2. Bivariate correlations

Variables	1	2	3	4
1 Age	1			
2 Academic self-regulation	.048	1		
3 Academic stress	-.084	-.265**	1	
4 Educational perceptions	.289**	.375**	-.173*	1

Note: ** Correlation is significant at the .01 level
* Correlation is significant at the .05 level

3.1 Linear multiple regression

The correlation between academic stress and perceived online educational experience is negative and low (r = -.173, p > .05), suggesting that there is no clear relationship between these two factors. Furthermore, the correlation between academic self-regulation patterns and academic stress is negative and moderate (r = -.265, p < .01), suggesting that students who have higher scores on academic self-regulation patterns tend to experience less academic stress.

Finally, age did not show significant relationships with self-regulation patterns or academic stress, so there is no clear relationship between these factors.

Table 3. Summary of the model

R	R^2	Std. Error	Change statistics					Durbin-Watson
			R2 Change	F Change	df1	df2	Sig. F Change	
.466	.218	5.674	.218	13.531	3	146	>.001	1.83

Note: Predictor variables: (Constant), academic stress, age, patterns of academic self-regulation.
Dependent variable: Perception of educational experience in online modality

Table 4 shows the coefficients resulting from the model. The age variable has a positive and significant standardized coefficient (β_1 = .268, p < .001), suggesting that as age increases, the perception of online educational experience also tends to be more positive. Patterns of academic self-regulation also have a positive and significant standardized coefficient (β_2 = .346, p < .001), suggesting that students who have higher patterns of academic self-regulation also tend to have a more positive perception of the online educational experience.

Table 4. Coefficients

Model	Unstandardized Coefficients		β	t	p	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error				Lower Bound	Upper Bund	Tolerance	VIF
(Constante)	.546	6.736		.081	.936	-12.767	13.859		
Age	.227	.062	.268	3.643	.000	.104	.350	.992	1.008
Self-regulation	.308	.068	.346	4.561	.000	.175	.442	.929	1.076
Stress	-.023	.029	-.059	-.778	.438	-.081	.035	.925	1.081

Note: Dependent variable: Perception of educational experience in online modality

On the other hand, academic stress does not have a significant standardized coefficient (β_3 = -.059, p > .05), suggesting that there is no clear relationship between this variable and the perception of online educational experience.

IV. Discussion and conclusions

Returning to the aim of this research, which was to identify some of the key student factors that influence the perception of their online learning educational experience, the results suggest that most participants tend to show a moderately positive perception of their educational experience with the online modality, which is consistent with the findings of Humanante-

Ramos et al. (2019), Sholikah and Sutirman (2020), and Uribe et al. (2023). In addition, a moderate level of academic self-regulation, with moderate variability in responses, like the findings of Mora et al. (2020) and moderate to low levels of academic stress, different from Cofini et al. (2022) where the levels were moderate to high.

4.1 Bivariate correlations

The positive and moderate correlation between age and perceived online educational experience is like the results obtained by Cofini et al. (2022) and Canova-Barrios et al. (2023), suggesting that as age increases, the perception of online educational experience also tends to be more positive. It is possible that this is because older sample participants are more willing to familiarize and take on the commitments of the online educational experience.

The positive and moderate relationship between patterns of academic self-regulation and perceptions of the online educational experience indicates that for the students in the sample, this is consistent with the correlational studies reported by Mora et al. (2020), Machuca et al. (2021) and Makhno et al. (2022), who state that students with stronger academic self-regulation skills display a better adaptation ability to virtual learning environments and make the most of the opportunities they offer.

Nevertheless, the negative and low correlation between academic stress and student perception of the online educational experience suggests that students in the sample with lower levels of stress have a more positive

perception, like the results of Cofini et al. (2022), where higher stress scores were related to lower satisfaction scores. However, the results are not conclusive to affirm this, as it could also be since the academic stress experienced by the participants is not directly related to the online environment, but more so to other external or personal factors.

Finally, age did not show significant relationships with self-regulation patterns or academic stress, so there is no clear relationship between these factors.

4.2 Linear multiple regression

The model suggests that age and patterns of academic self-regulation are significant predictors of perceived online educational experience, while academic stress does not seem to be related to this variable. It is worth remembering that students who perceive online educational experience positively value the convenience of this modality, the possibility of communicating with teachers and receiving timely feedback and evaluations (Humanante-Ramos et al., 2019; Sholikah & Sutirman, 2020; and Olivera, 2020). Furthermore, according to various authors, these students are those who tend to be motivated by the type of academic demands and be proficient in the use of technology.

These are all factors related to those students who mature as they become older and more experienced, and who develop patterns of self-regulation as they take ownership of their learning processes. However, there still exists a significant number of students who do not positively associate with online

experience, and their use of technologies and electronic devices remains disconnected from their role as learners, being more associated with leisure and recreation time.

It is useful to understand that when some students associate online connectivity devices and technology with a hobby or distraction, they fail to link them to a new lifestyle that includes formal learning mediated by an institution. Consequently, despite possessing technological skills and abilities, they resist using them in education. Therefore, they often have a negative perception of any online experience.

On the other hand, the relationship between online experience and the stress variable requires further study, as it could be related to the research findings of Dávila et al. (2022) and García and González (2022), who state that stress is more associated with whether or not the student can rely on regulation strategies, which help them to cope better with the demands of the online educational experience, hence they may feel more or less satisfied with the results they obtain.

Other possible relationships associated with stress that have not been addressed in this study include technical difficulties that often hinder participation in online activities. Additionally, the lack of interaction with peers, which is sometimes not feasible and causes students to feel isolated, can affect their emotional stability. Lastly, the overload of work with assignments or activities can make them feel overwhelmed as they struggle to manage them.

The implications of these results are that they guide the planning of future online experiences by confirming that not all students perceive them in the same way, so it is necessary to consider their individual characteristics. In addition, it is very important to promote the development of self-regulation patterns to contribute to the management of online educational demands and, above all, to consider that the youngest students are the ones with the least competences to cope with online education, and require training, support and follow-up to achieve success in it.

However, this study has limitations that should be considered. First, the sample is relatively small and non-probabilistic, which limits the generalizability of the results. In addition, the fact that the participation of women is higher than men's introduces an uncontrolled gender bias. Furthermore, the cross-sectional design prevents establishing causal relationships, and the use of self-reports to measure variables such as academic stress could be influenced by social desirability.

Likewise, it should be noted that currently many teachers are facing technology, refusing to use it as a means of teaching and learning. Some of them recognize its advantages but lack the necessary knowledge to implement it in their subject delivery. It is necessary for them to develop skills to enhance their teaching practice, adapting to the demands of an increasingly digitized educational environment. At the same time, there should be a promotion of students' training to adequately confront a digitized world.

4.3. Future research

Although the results are comparable with those of other researches, there is still much to be done on this topic. It is important to bear in mind that there are other factors that could be influencing the perception of the online learning experience that have not been considered in this model. Therefore, further studies are needed to better understand the relationships between those variables and to identify other factors that may be influencing this perception.

Future research should consider the characteristics of the course or instructional design of the subject itself (duration, demand, required activities), the educational platform (usability, design), technological development (Internet access and speed), characteristics of the devices (access to PCs, laptops, tablets, mobiles). Likewise, to incorporate into the model the measurement of other variables associated with the student's internal processes, among which are: technological self-efficacy, academic motivation, the student's technological competences, their experience of online education, the student's academic load and the results obtained.

Along with this, the possible influence of the teacher's competence or ability to manage the online educational experience should be evaluated, not only in terms of technology proficiency but also in the appropriate selection of resources and tools based on learning objectives. Furthermore, assessing how they promote meaningful learning and experiences that contribute to

metacognition and the development of critical and creative thinking skills, problem-solving, and decision-making is essential.

Finally, regarding the measurement of academic stress, it is recommended to adapt an instrument that investigates events associated with online experience. It would also be useful to conduct mixed studies combining multivariate analysis techniques and in-depth interviews to reveal more specific details about the study sample.

Contribución de autoría

María Antonieta Elvira-Valdés: Metodología (100%), Investigación (100%), Recursos (100%

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Declaración de no conflicto de intereses

Los autores declaran no tener conflicto de intereses.

Referencias

AERA (American Educational Research Association), APA (American Psychological Association), & NCME (National Council on Measurement in Education). (2018). *Estándares para pruebas educativas y psicológicas*. American Educational Research Association. https://www.testingstandards.net/uploads/7/6/6/4/76643089/9780935302745_web.pdf

Asalde, D., & Cárdenas, D. (2022). La educación virtual desde la satisfacción estudiantil. *Tribunal: Revista en Ciencias de la*

Educación y Ciencias Jurídicas Artículos de Investigación, 2(3), 81–113. https://doi.org/10.59659/revistatribunal.v.2i3.16

Almoslamani, Y. (2022). The relationship between self-regulation learning and online learning adoption. *Cypriot Journal of Educational Sciences, 17*(6), 2117–2126. https://doi.org/10.18844/cjes.v17i6.7550

Castellano, J.M., Almagro, J., & Fajardo, Á.B. (2021). Percepción estudiantil sobre la educación online en tiempos de COVID-19: Universidad de Almería (España). *Revista Scientific, 6*(19), 185–207. https://doi.org/10.29394/Scientific.issn.2542-2987.2021.6.19.9.185-207

Canova-Barrios, C.J., Méndez, P.G., Sosa, L.R., Flores, M.A., Rodríguez, M.A., & Hernández, S.S. (2023). Percepción y satisfacción de estudiantes de Enfermería con la educación virtual en época de COVID-19. *Enfermería: Cuidados Humanizados, 12*(2). https://doi.org/10.22235/ech.v12i2.3304

Castro, N.P., Suárez, X.A., & Rivera, P. (2021). Estrategias de autorregulación usadas por universitarios en entornos virtuales y satisfacción académica alcanzada en pandemia. *Mendive: Revista de Educación, 19*(4),1127-1141. https://mendive.upr.edu.cu/index.php/MendiveUPR/article/view/2555

Chávez, J., Chávez, J., Villarreal, D., & y Ortiz, L. (2021). Factores de estrés en estudiantes universitarios en época de pandemia (Covid-19). *Horizontes: Revista de Investigación en Ciencias de la Educación, 5*(20), 310-324. https://doi.org/10.33996/revistahorizontes.v5i20.275

Cobo-Rendón, R., Romero, R., Becerra, P., & Ortega, M. (2022). Aceptación tecnológica, autorregulación del aprendizaje y satisfacción académica en universitarios durante la pandemia por COVID-19. *Revista E-Psi, 11*(1), 28-45. https://revistaepsi.com/artigo/2022-ano11-volume1-artigo2

Cofini, V., Perilli, E., Moretti, A., Bianchini, V., Perazzini, M., Muselli, M., Lanzi, S., Tobia, L., Fabiani, L., & Necozione, S. (2022). E-Learning Satisfaction, Stress, Quality of Life, and Coping: A Cross-Sectional Study in Italian University Students a Year after the COVID-19 Pandemic Began. *International Journal of Environmental Research and Public Health, 19*(13), 8214. https://doi.org/10.3390/ijerph19138214

Dávila, R.C., Zuta, N., Espinoza, F.C., & Chávez-Díaz, J.M. (2022). Educación remota y estrés académico en estudiantes universitarios peruanos en tiempos de pandemia del covid-19. *Revista Universidad y Sociedad, 14*(3), 775-783. https://rus.ucf.edu.cu/index.php/rus/article/view/2926

de Pablo, J., Baillés, E., Pérez, J., & Valdés, M. (2002). Construcción de una escala de estrés académico para estudiantes universitarios. *Educación Médica, 5*(1), 40-46. https://doi.org/10.33588/fem.51.437

Díaz-Camacho, R.F., Rivera, J. L., Encalada, I.Á., & Romani, U.I. (2021). La satisfacción estudiantil en la educación virtual: una revisión sistemática internacional. *Revista de Ciencias Sociales y Humanidades*, (16), 177–193. https://doi.org/10.37135/chk.002.16.11

Elvira-Valdés, M., & Pujol, L. (2015). Propiedades psicométricas y estructura factorial de la Escala de Aprendizaje Autorregulado (EAA) en adolescentes. *Revista Psicogente, 18*(33), 66-77. https://revistas.unisimon.edu.co/index.php/psicogente/article/view/1426

Fernández-Batanero, J.M., Román-Graván, P., Reyes-Rebollo, M.M., & Montenegro-Rueda, M. (2021). Impact of educational technology on teacher stress and anxiety: A literature review. *International Journal of Environment Research and Public Health, 18*(2), 1-13. https://doi.org/10.3390/ijerph18020548

García, J., & González, E.I. (2022). El estrés académico causante de la procrastinación en la educación virtual. Una revisión sistemática. *Revista Iberoamericana para la Investigación y el Desarrollo Educativo, 13*(25). https://doi.org/10.23913/ride.v13i25.1238

Garzón, A., & Organista, P. (2021). Hacia mejores prácticas en el aprendizaje en línea: fomento de la autorregulación del alumno. *Administración & Desarrollo, 51*(1),4-29. https:///doi.org/10.22431/25005227.vol51n1.1

Humanante-Ramos, P., Fernández-Acevedo, J., & Jiménez, C. (2019). Aulas virtuales en contextos universitarios: percepciones de uso por parte de los estudiantes. *Revista Espacios, 40*(02), 3-20. https://ww.revistaespacios.com/a19v40n02/19400203.html

Google LLC (2024). *Google Forms terms of service*. https://policies.google.com/terms

Machuca, S.A., Sampedro, C.R., Palma, D.P., & Villalta, B.E. (2021). Autorregulación del aprendizaje en línea y procrastinación académica como factores de la efectividad del aprendizaje virtual. *Revista Conrado, 17*(3), 122-130. https://conrado.ucf.edu.cu/index.php/conrado/article/view/2147

Makhno K., Kireeva N., & Shurygin V. (2022). The impact of online learning technology on self-regulation and student success. *Research in Learning Technology, 30*, 1-18. https://doi.org/10.25304/rlt.v30.2802

Manrique, K., & Sánchez, M. (2019). Satisfacción estudiantil universitaria un referente para elevar los indicadores de los cursos en línea impulsados por la Coordinación General de Educación Virtual de la UAGro. *Cuaderno de Pedagogía Universitaria, 16*(31), 17-30. https://doi.org/10.29197/cpu.v16i31.321

Moawad, R.A. (2020). Online learning during the COVID-19 pandemic and academic stress in university students. *Revista Romaneasca pentru Educatie Multidimensionala, 12*(2), 100-107. https://doi.org/10.18662/rrem/12.1sup2/252

Mora, C.T.T., Mahecha, J.C., & Conejo, F. (2020). Procesos de autorregulación del aprendizaje y desempeño académico en estudiantes de pregrado bajo la modalidad virtual. *Cultura, Educación y Sociedad, 11*(2), 191–206. https://doi.org/10.17981/cultedusoc.11.2.2020.12

Meza, E.F., Soledispa, F.G., Criollo, B.M., & Rodríguez, L.J. (2023). La educación a distancia y sus desafíos: Un análisis de las mejores prácticas y estrategias para superar las barreras en el aprendizaje en línea. *Ciencia Latina: Revista Científica Multidisciplinar, 7*(2), 6126-6147. https://doi.org/10.37811/cl_rcm.v7i2.5777

Nunnally, J.C., & Bernstein, I.J. (1995). *Teoría psicométrica* (3ª ed.). McGraw-Hill.

Olivera, E. (2020). Satisfacción académica de los estudiantes universitarios en el marco de la educación virtual. *Revista Científica de Comunicación Social Bausate, 2*, 16-24. http://revistacientifica.bausate.edu.pe/index.php/brc/article/view/33/5

Ramírez-Gil, E., Reyes-Castillo, G., Rojas-Solís, J.L., & Fragoso-Luzuriaga, R. (2022). Estrés académico, procrastinación y usos del Internet en

universitarios durante la pandemia por COVID-19. *Revista Ciencias de la Salud, 20*(3), 1-26. https://doi.org/10.12804/revistas.urosario.edu.co/revsalud/a.11664

Requena, M. (julio, 2020). *Autorregulación del aprendizaje y su andamiaje en entornos virtuales: Fases, procesos y estrategias*. Actas del XIII Congreso Iberoamericano de Computación para el Desarrollo - COMPDES2020.

Salinas, H.A., Díaz, J.J., Alvarez, C.D., & Saucedo, M. (2022). Hábitos de estudio, motivación y estrés estudiantil en ambientes virtuales de aprendizaje. *Revista Boletín Redipe, 11*(1), 392-409. https://revista.redipe.org/index.php/1/article/view/1650

Santana, M., Luna, L., Ramos, C., Guzmán, J., Martínez, L., & Lozano, E. (2002). Estrés y afrontamiento ante las clases virtuales en estudiantes universitarios durante la contingencia sanitaria por Covid-19. Diálogos sobre educación. *Temas actuales en investigación educativa, 13*(25). https://doi.org/10.32870/dse.v0i25.1122

Segovia-García, N., & Said-Hung, E. (2021). Factores de satisfacción de los alumnos en E-learning en Colombia. *Revista Mexicana de Investigación Educativa, 26*(89),595-621. https://www.scielo.org.mx/pdf/rmie/v26n89/1405-6666-rmie-26-89-95.pdf

Sholikah, M., & Sutirman, S. (2020) How Technology Acceptance Model (TAM) Factors of Electronic Learning Influence Education Service Quality through Students' Satisfaction. *TEM Journal, 9*(3), 1221-1226. https://doi.org/10.18421/TEM93-50

Suárez-Guerrero, C., Rivera-Vargas, P., & Raffaghelli, J. (2023). EdTech myths: towards a critical digital educational agenda EdTech myths: towards a critical digital educational agenda. *Technology Pedagogy and Education online*, (37), 1-16. https://doi.org/10.1080/1475939X.2023.2240332

Torres, M., & Monge, D. (2023). Percepción de estudiantes universitarios sobre la calidad de la educación en entornos no presenciales. *Ciencia Latina: Revista Científica Multidisciplinar, 7*(6), 2750-2766. https://doi.org/10.37811/cl_rcm.v7i6.8884

Uribe, J., Zacarias, X., Lozano, M., & Álvarez, K. (2023). Percepción del rol docente y clases en línea en el contexto de la pandemia por covid-19 en estudiantes universitarios. *Revista Tempus Psicológico, 6*(2), 66-78. https://doi.org/10.30554/tempuspsi.6.2.4691.2023

Villegas, E., Labrador, E., Fonseca, D., Fernández-Guinea, S., & Moreira, F. (2019). Design Thinking and Gamification: User Centered Methodologies. In *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence Bioinformatics)*. https://doi.org/10.1007/978-3-03021814-0_10

Zambrano R.J. (2016). Factores predictores de la satisfacción de estudiantes de cursos virtuales. *RIE: Revista Iberoamericana de Educación a Distancia, 19*(2), 217–235. https://doi.org/10.5944/ried.19.2.15112