The Social Presence of University Students in Virtual Teaching-Learning Environments in Times of Covid-19

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In this study, the social presence of university students participating in virtual learning environments was analyzed to determine the effectiveness of these new teaching-learning methods in the wake of the COVID-19 pandemic. Social presence is the ability of students to represent themselves socially and academically in an online context. Parameters related to social presence were considered, as well as the use of virtual environments and the perception of students regarding educational quality and teaching methods. It is observed that the social presence in the virtual classes is not the most effective, the results reveal that the students are passive, present economic difficulties, and need deeper teacher training for successful management of online academic strategies.

Keywords: social presence, virtual teaching-learning environments, university students

INTRODUCTION

This study corresponds to the results of research on the social presence of university students in virtual environments during the Covid-19 pandemic, before the provisions of the Government to implement isolation and social distancing. This is what prompted the adaptation of virtualized classrooms encompassing all educational levels across the country.

Through the observation of virtual learning platforms, central problems have been identified: The social absence of students on the network, active participation, engagement, and passivity. Although students may be "connected" in many cases and fulfill the online tasks; this does not mean effective learning is taking place. Furthermore, socio-academic factors and access to these virtual spaces perpetuate these issues.

To better understand the variables and structure of this research, topics such as the social presence of the student, the use of virtual environments, and the level of retention obtained were both defined by theoretical aspects and research results.

The body of research was conducted in the months of July and August 2020 and corresponds to an ex-post, non-experimental study. 795 students selected at random, participated in the research process. Among them, 51.3 % were female, while 48.7 % were male. The mean age was 20.35 years, with a standard deviation of 2.21 years.

Social presence was evaluated using the social presence measurement scale of online minds (Harms, & Biocca, 2004), a version adapted to Spanish by Agut et al. (2011). The initial scale consisted of 36 items and 5 dimensions and was reduced to 23 items and 5 dimensions, corresponding to co-presence, perceived understanding of the message, perceived affective understanding, perceived affective interdependence, and perceived behavioral interdependence. A Likert scale is used which ranges from 1 to 7, and takes into account the aspects of agreement or disagreement. To determine the total score of social presence, the mean of all the values is calculated. To obtain the total scores by dimensions, the arithmetic mean of the items belonging to each dimension is calculated.

Perceived learning was measured with the scale of Richardson & Swan (2003), the scale is unidimensional and consists of 9 items with a Likert scale that ranges between 1 and 7. The degree of use regarding EVEA was measured through a Likert scale that ranges from 1 (never) to 7 (many times). Information was also collected about sex, age, occupation, year, and area of study.

For the application, the scales were structured using a Google forms format, then sent to individuals through social networks and email. The scale instructions and confidentiality of the data provided (informed consent form) were collected, and information on the objective's research was compiled once complete.

Regarding the statistical analysis, exploration of the data indicates that they do not approximate a normal distribution ($p < 0.05$). A descriptive and comparative analysis of social presence, EVEA, and perceived learning according to the number of groups was carried out. To compare two independent samples, the Mann-Whitney U was used, its effect size (*ES*) calculated from the probability of superiority (PSest) of the interpretive rules, No effect (PSest $\leq = 0.0$), small (PSest ≥ 0.56), medium (PSest ≥ 0.64) and large (PSest ≥ 0.71) (Ventura, 2016; Grissom, 1994). The comparison of more than two independent samples was made with the Kruskal-Wallis H, its effect size (TE) used was (n2H) eta squared (Tomczak, & Tomczak, 2014) being its interpretative norms (n2H ≥ 0.04 minimum necessary), (n2H ≥ 0.25 moderate), (n2H ≥ 0.64 strong) as proposed by Dominguez (2018), and to establish the correlations, Spearman's Rho was used.

Regarding the information of the participants, it is specified that according to the economic dependence of the student, it was observed that: 70.1 % depend on their parents; 18.2 % depend on themselves; and 11.7 % depending on other family members. According to the occupation, it was possible to determine that: 69.7 % of students only study, while 30.3 % study and work. Regarding the area of studies, 43.8 % (348) of those evaluated are from the area of social sciences, 38.8 % (308) from the area of engineering, and 17.4 % (138) from biomedical. Another aspect considered was the year of studies, where it was observed that 14.2 % are first-year students, 27.5 % correspond to second-year students, 24.9 % are third-year, 13 % are fourth-year, 13.1 % from the fifth year, and 7.3 % from sixth year. Regarding the resource or technological equipment that they use to enter the virtual environment, it was found in the survey that 43.6 % connect

through their cell phone (mobile phone), 36.7 % use a laptop, 17.7 % use a PC, and 1.9 % a tablet. And as for internet access, 72.2 % revealed that they can access the internet, 27.4 % said that they can sometimes access and 1.9 % made it known that they can hardly ever access the internet.

THE SOCIAL PRESENCE IN VIRTUAL ENVIRONMENTS

The COVID-19 pandemic has caused extraordinary, unexpected situations throughout the world, not only in economic and physical health but also in various work, academic, and family environments (UN CEPAL, 2020). The unforeseen consequences of the pandemic were unpredictable, demanded the world's attention, and forced society to adopt new habits and behaviors in unexpected ways.

In Peru, the pandemic has impacted all sectors, both productive and services. However, the greatest effect has been in the health and education sectors. The main provision considered by the Peruvian State to mitigate the number of infections was isolation and social immobilization (Renzo, & Medina, 2020). Teachers and students in face-to-face settings transitioned to virtual classrooms, where all activities and communications were carried out through online platforms to eliminate physical proximity whilst complying with the academic curriculum. (Enoki, 2020; Rojas et al., 2020).

This new educational situation was unexpected, and, in most cases, there was not adequate preparation to attend to the different situations that online education presented. Both institutions, teachers, and students found themselves taking on new challenges every day. This transition generated many difficulties, for everyone involved, most of whom were the teachers as they were not trained on, the technological tools required to teach in virtual environments. In addition, many students had limitations to Internet access, either because of their limited financial resources, or the work situation of their parents, who were also affected by the pandemic.

Concerning the teaching methodology Also affected by this situation, was the teaching methodology, which was synchronous and asynchronous classes focused on the accumulation of activities, which was not necessarily productive, and which are framed with the need to comply with the school curriculum, rather than in the need to teach properly. This type of situation considerably affects stress in students, who in addition to having to face the adversities of the pandemic, also have family situations that influence their emotional states (Suárez et al., 2020; Murillo, & Duk, 2020; Estrada et al., 2020).

In general, students are used to academic activity in person, even when there are virtual elements, such as homework, forums, etc. their main inclination is towards explanation and follow-up in person. Schooling in Latin America has historically been face-to-face (Vesuri, 1997), and in recent years there has been a trend towards a participatory education, which seeks the interaction of the teacher with the academic needs of the student, in a closer and more committed way (Puiggrós, 1983; Pizan, Barros, & Yupari, 2020).

These indications about the contextualization of education in Latin America do not neglect the educational reality of Peru, where education has transitioned to a new way of teaching and learning as a result of the pandemic.

Virtual teaching-learning environments (EVEA) are integrated systems for learning, which are supported by web tools to manage information and communication in the teaching process (Agut et al., 2011). In this system, students interact with each other and achieve the teacher-student relationship. Through the EVEA system, the user feels the presence of one another (Medina, 2016).

In this sense, the social presence in the network is understood as the ability or capacity of its students to integrate, participate, and cooperate in a virtual learning community for educational processes. A fundamental contribution of these tools consists in establishing positive social relationships within the collaboration processes. In this sense, it is possible to assume that if the user successfully participates, they will not experience loneliness or absence in virtual environments (Esteve et al., 2017).

In connection to the concepts of understanding social presence in the network proposed by Gutiérrez & Gallego (2017), co-presence is identified as the degree to which the person does not feel alone, the psychological involvement with the other, degree of attention, understanding between users and behavioral interaction and degree of belief about the actions carried out by the user are considered interdependent or sensitive to the other person (Baez, & Ossandón, 2015).

Maintaining a social presence in virtual classes is essential to ensure a better quality of education, although a high number of students are punctual and participate in the delivery of activities and tasks, social presence is still an ongoing problem. , Therefore, indicating the quality of teaching is not optimal.

As a result of the fieldwork, the following could be verified: Table 1 describes the numerical values of the variable social presence of the student in network environments, the average was 84.56 out of a maximum range of 156 points, and the median indicates that 50 % of students have scored lower than 84, showing that the score is moderate; this indicates that the majority of students are connected to the virtual environment, but do not show adequate interaction and participation; it could be said that they are not alone in the virtual environment, they moderately understand the message of the interlocutors; however they feel that they are not understood emotionally and are sometimes affected by the behavior with some interlocutors. This is a consequence of the traditional forms of teaching, which have had an impact on the new modality of studies since there is no teacher preparation to take on the new educational trends.

Although the student may be connected to the virtual classroom, it does not mean that they have an active social presence, so the degree of social presence in virtual environments by students presents irregularities; and moderate levels were observed in the evaluation, indicating that the implementation of educational strategies to seek active participation of the student in the network has not yet been completed.

Regarding the comparisons of social presence and its study dimensions (Table 2), the social variables observed were statistically significantly different according to gender and age; whereas when evaluating the student's occupation, no significant differences between men and women were found. When evaluating participation in virtual classrooms, it was possible to show that women have greater interaction than men and demonstrate better behavioral understanding. It could also be observed that younger students have greater participation in virtual classrooms, stating that they feel greater co-presence in contrast to older students. However, older students show greater behavioral interdependence.

When evaluating the aspects associated with the year and area of study, it could be observed that the students in their first year perceive higher levels of co-presence in virtual environments than upperclassmen; however, in the comprehension assessment, the students within the last year of their studies showed this indicator better than students in other years of studies. Concerning areas of studies, it is the students in social sciences who demonstrate better levels of social presence rather than the students of engineering and biomedical areas (small effect size).

TABLE 1
THE SOCIAL PRESENCE OF STUDENTS IN THE VIRTUAL ENVIRONMENT

Social Presence	***M***	***DE***	***Md***	***Min.***	***Max.***
Global social presence	84.56	23.59	84	24	161
Co-presence	19.12	5.99	20	5	35
Perceived understanding of the message	15.14	4.54	16	4	28
Perceived affective understanding	13.58	4.55	13	4	28
Perceived affective interdependence	17.93	6.01	18	5	35
Perceived behavioral interdependence	18.79	6.11	18	5	35

Note: M = Average; SD = Standard Deviation. ; Md = Median. ; Min. = Minimum; Max = Maximum.

TABLE 2
COMPARISONS OF SOCIAL PRESENCE ACCORDING TO SOCIO-EDUCATIONAL VARIABLES

	Sig (TE)*	*Sig** (TE)*	*Sig*** (TE)*	*Sig****(TE)*	*Sig ******
Global social presence	.000 (0.34)	.000 (0.04)	.466	.000 (0.13)	.231
Co-presence	.000 (0.37)	.001 (0.20)	.007 (0.12)	.000 (0.05)	.146
Perceived understanding of the message	.000 (0.38)	.000 (0.06)	.572	.000 (0.05)	.724
Perceived affective understanding	.000 (0.42)	.264	.049 (0.02)	.000 (0.21)	.374
Perceived affective interdependence	.000 (0.32)	.000 (0.25)	.804	.000 (0.33)	.240
Perceived behavioral interdependence	.000 (0.36)	.000 (0.07)	.305	.169	.459

Sig= Significance. TE= Effect Size. Note: * comparison between sexes. **comparison by age. *** comparison by years of study. **** Comparison by study area. ***** comparison by occupation.

LEARNING IN VIRTUAL ENVIRONMENTS

Certainly, the objective of virtual environments is to improve learning in higher education through access to resources and methodological strategies. However, the level of learning differs between one student and another (Lechuga et al., 2014).

In this sense, virtual learning is known as online learning, developed virtually through platforms that allow adequate interaction between its users (Ruiz, 2020). In this regard, the level of learning can also be conditioned by variables intervening parties such as sex, age, marital status, place of origin, economic situation, family harmony, health, and internet access (Rojas et al., 2020). Some authors point out that to improve online learning, interactive learning platforms, virtual specialized libraries, training for teachers and students on the management of information and communication technologies, and acquisition of virtual simulators to develop practices, among other elements that enrich the teaching process, must be implemented (Cayo, & Agramonte, 2020).

Therefore, this work also analyzes learning in virtual environments, considering different socio-educational variables that intervene in the training of students.

Online Teacher Skills

The traditional teacher is no longer a good representation in modern educational setting The new teaching role must focus on other aspects that go beyond the classroom, among these elements are : (i) encourage participation in students; (ii) change the pedagogical approach of the students; (iii) use the virtual classroom to support the teacher management; (iv) improve video and image content to gain student attention; (v) appropriate use of the internet and social networks

Pedagogical Competencies That the Teacher Must Have in Virtual Environments

In the new virtual educational environments, the teacher plays a fundamental role, characterized mainly by orienting themselves around collaborative environments, where the development of social skills is integrated, with greater communication and greater incentives for participation while trying to include everyone within the teaching process.

Teacher's Pedagogical Competencies in Virtual Environments

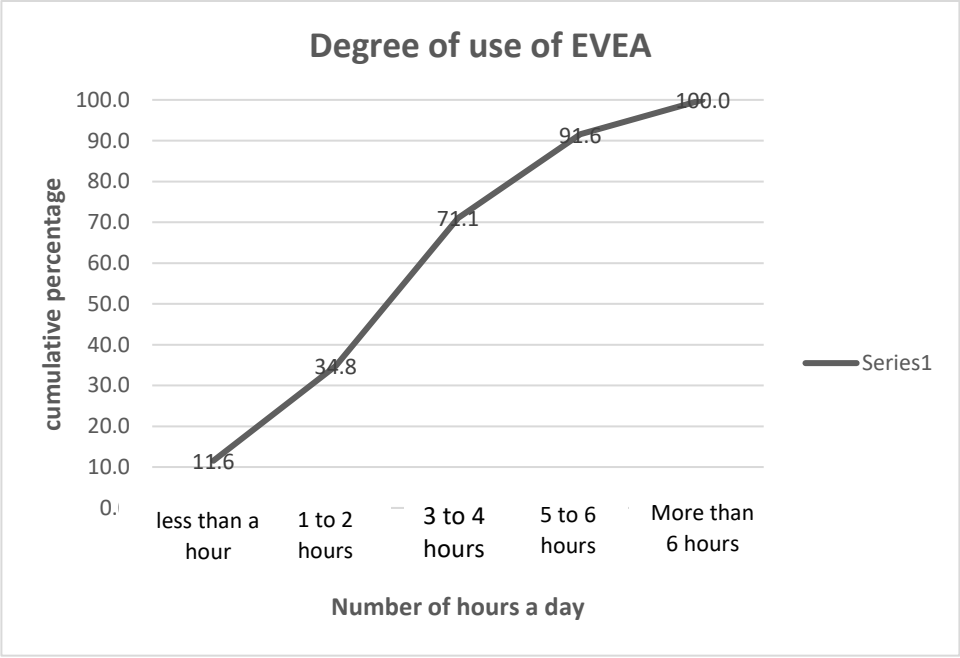
New teaching strategies must be selected with great care to cover the contents and achieve dynamic academic environments, where activities promote autonomous research and collaborative work. They must then also recognize the learning styles of their students, provide personalized advice, and accompany them in tutorials and reinforcements when necessary. Some relevant aspects of the new pedagogical skills of the virtual teacher would be the following:

(i) Offer broad information but leave room for individual and autonomous inquiry by students.;
(ii) Consider the desired learning outcomes to be able to design activities and academic exercises that are adapted to virtual environments.;
(iii) Lead discussions, brainstorms, and debates, to finally generate summaries that contribute to the knowledge of the students.;
(iv) Guide on the use of the virtual library, bibliographic sources, and publication of works online.

In this sense, when evaluating the daily use of virtual teaching environments, the results show that 36.2 % of students use EVEA between 3 to 4 hours a day, 23.3 % between 1 to 2 hours, 20.5 % between 5 to 6 hours, 11.6 % less than 1 hour and 8.4 % more than 6 hours (Figure 1).

In this regard, Table 3 shows that when making the comparisons, it was possible to see that on average, it is men who log more hours using the virtual environment than compared to women (small effect size); concerning age, the youngest aged students who use virtual environments more than compared to older ones (small effect size); and according to the area of study, it is students from the engineering area who use the EVEA more than students of social and biomedical sciences (small effect size). Regarding the technological resources or equipment that students use, those who can access a cell phone are those who use the virtual environment more than those using a laptop or computer (moderate effect size).

FIGURE 1
DEGREE OF USE OF EVEA PER DAY



Note: cumulative ojiva
Source: author's elaboration.

TABLE 3
COMPARISONS OF THE USE OF THE EVEA ACCORDING TO SOCIAL AND ACADEMIC VARIABLES

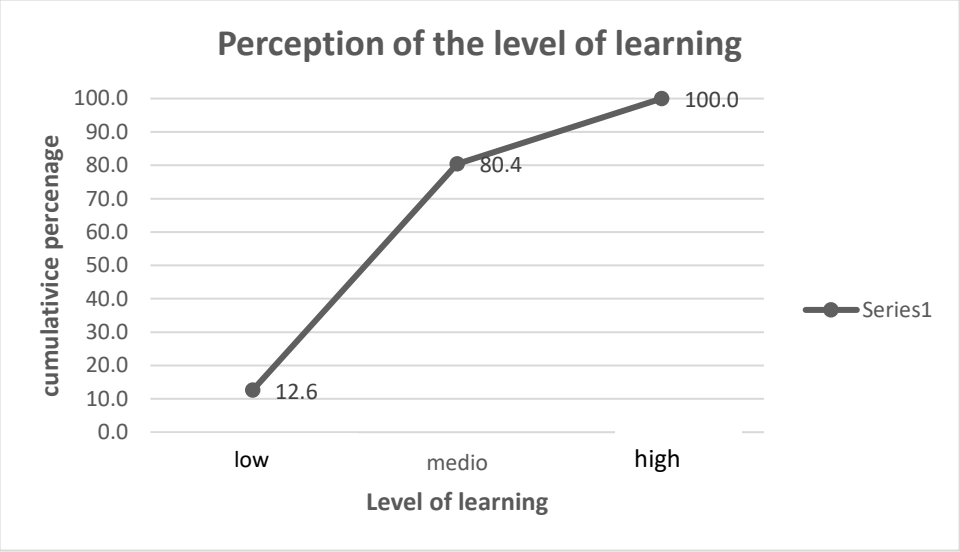
	Sig* (TE)	***Sig** (TE)***	***Sig****	***Sig***** (TE)***	***Sig*******
Using the EVEA	.035 (0.46)	.000 (0.25)	.119	.000 (0.14)	.026 (0.59)

Note: Sig = Significance; TE = Effect Size. * Comparison between sexes; ** comparison by age; *** comparison by years of study; **** Comparison by study area; ***** comparison by resource or technological equipment.

Figure 2 describes the student's perception of the level of learning in virtual environments, according to the measurement, it was found that for a significant number of students, the perceived level of learning is medium, while for others it is high, and for a smaller group is considered low. In this sense, it can be assumed that students consider their perceived level of learning has not changed when compared to face-to-face education, although the quality of learning is not the most adequate since a good number of teachers do not use the tools of information and communication technologies appropriately; likewise, several students do not have economic resources, especially to pay for Internet services, which limits their access. The great concern of students lies not in losing the academic year but in passing courses without having obtained quality learning.

The learning perceived according to socio-educational variables was compared, finding statistically significant differences only in the areas related to the quality of the learning, where it was possible to assume that only the students with higher performance and greater discipline value this aspect. The learning perceived was also valued by younger students, from the area of social sciences, who are applied in their studies and contributed important results regarding this question. However, the older students showed considerable acceptance of variables related to learning, stating that learning is significant and appropriate to achieve the expected knowledge (Table 4).

FIGURE 2
PERCEPTION OF THE LEVEL OF LEARNING IN THE VIRTUAL ENVIRONMENT (EVEA)



Note: cumulative ojiva

TABLE 4
COMPARISONS OF THE PERCEPTION OF THE LEVEL OF LEARNING ACCORDING TO SOCIAL AND ACADEMIC VARIABLES

	M	*Sig**	*Sig** (TE)*	*Sig*** (TE)*	*Sig**** (TE)*	*Sig***** (TE)*
Learned the same or even more than in face-to-face classes.	3.75	.882	.574	.082	.472	.494
The quality of learning in the classes was excellent.	3.78	.777	.541	.281	.894	.048 (0.46)
What you have learned allows for better performance.	4.03	.517	.832	.220	.531	.381
Do things you didn't know how to do before.	4.35	.594	.062	.099	.575	.244
With what you have learned, you get a good grade.	3.81	.255	.000 (0.02)	.256	.017 (0.01)	.030 (0.45)
You earned a lot with this type of work.	3.94	.184	.077	.507	.725	.588
What you have been learned you have made it possible to consolidate knowledge.	3.95	.840	.046 (0.01)	.032 (0.01)	.851	.891
Solving problems alone or in interaction with colleagues allowed better learning.	4.14	.804	.432	.449	.794	.793
Having to adopt active learning allowed for better understanding.	3.75	.947	.000 (0.02)	.134	.630	.502

Sig= Significance. TE= Effect Size. Note: *Comparison between sexes.; **comparison by age; *** comparison by years of study; ****comparison by study area; ***** comparison by occupation.

Once the information collection process was completed, it was observed that there is no significant relationship between social presence and virtual environments (Table 5), nor a significant relationship between social presence and learning, but it is possible to assume that virtual environments influence learning considerably, therefore that learning can be achieved in a positive and significant way with the proper use of virtual tools, and with high levels of discipline and self-learning.

TABLE 5
CORRELATIONS OF SOCIAL PRESENCE, EVEA AND LEARNING

Rho Spearman	Social presence	EVEA	Learning
Social presence	1		
EVEA	,030	1	
Learning	,042	,397**	1

Note: **correlation is significant at the 0.01 level (2-tailed).

DISCUSSION

According to the evaluation of the social presence of university students in virtual environments in the face of new teaching-learning methods as a result of the COVID-19 pandemic, the study revealed that the quality of teaching can be maintained even with virtual spaces and that it will depend on the teaching strategies and the student habits of all involved.

One of the most important aspects to consider for improvements in the virtual teaching process is teacher training in areas of technology management, use of computer equipment, and use of computer tools.

The adaptation of teaching methodologies in the new classrooms must reflect the student's needs, without neglecting the academic objectives. The teacher must also incorporate teaching within the family environment of the students and successfully get involved in the learning process. Traditional education is less effective when compared to the new modern era. The effectiveness of teaching quality takes precedence over the teachers qualifications as interdisciplinarity now represents the new approach to learning in the modern era.

This study has considered an analysis of the main aspects involved in online learning, a product of the Covid-19 pandemic, noting that the pandemic represents only one of the stressors in students, since the use of technological tools and Information technology is not easily accessible to everyone, and it is a considerable stressor on the student population.

Another factor observed in this research is the teaching methodology, which cannot be the same in the case of face-to-face classes, and which is confused between teachers and students when it comes to evaluations. Well, this factor saturates students with academic activities and presents shortcomings in the ways of teaching classes, leading to a substantial imbalance to achieve the expected success. Some authors affirm that social presence, based on the social and emotional projection of people in the context of virtual environments, can produce important positive aspects of learning (Esteve et al., 2017). Therefore, immersive virtual spaces with multiple users can allow the generation of much more optimal learning strategies than those where the social presence is not significant.

The new educational trends with inclusive virtual environments should consider the participatory integration of all those involved, to create dynamic and collaborative learning scenarios that favor social presence and make it possible to consolidate work teams for the development of activities. In this sense, the research carried out revealed that the social presence in the virtual classes of the social and engineering careers requires a greater methodological contribution to achieve a greater social presence.

In this study, it was possible to analyze and verify that social presence is essential in learning since it creates interrelationships of people that allow the cognitive integration of learning. Virtual classes should not be detached from the fundamental factors of education that include teacher engagement, the construction of knowledge, and social spaces.

Thus, social activities are related to affective interaction, open communication, and the cohesion of the people who interact in the virtual classroom community (Gutiérrez-Santiuste, Rodríguez-Sabiote, & Gallego-Arrufat, 2015). These elements cannot be separated from each other because they are essential for effective online teaching, which not only contributes to the generation of knowledge.

CONCLUSIONS

The current educational situation brought on unexpectedly by Covid-19, has generated some difficulties for the individuals involved, especially when interacting in virtual classrooms, showing levels of social absence on the network, especially by students, as explained (Esteve et al. 2017), if you do not have the ability or capacity to integrate and interact in the virtual classroom, it is most likely that you will experience loneliness or absence in these environments.

New educational trends pave the way for a universe of new approaches to learning, but they must adhere to responsible training for the individuals involved, who are generally teachers. If this condition is not met, it is most likely that online learning will not improve (Cayo, & Agramonte, 2020).

The new teaching methodologies must include virtual scenarios that integrate work groups and motivate the participation and self-learning of students. Changing teaching paradigms from one day to the next is not a simple task, adaptation to change must come from institutions to social entities, leaving traditional education aside and making way for new teaching processes.

The results found in this work also reveal a high level of anguish and stress in the student population, mostly a product of the new academic demands and economic limitations of the majority, as well as the excess of activities requested to meet the teaching requirements, considering these aspects with intervening variables that also influence the level of online learning, with the probability of obtaining an academic failure (Lechuga et al., 2014).

Therefore, the research carried out revealed the need to improve study policies, to achieve a balance between academic demands and new teaching methodologies, being necessary to continue researching the subject in question in other educational spaces to have greater guidelines that allow explaining the new virtual teaching-learning processes in these difficult times produced by Covid-19.

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