

## Satisfaction of University Students with Teaching Performance, When Applying Virtual Teaching in the Context of COVID-19

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**Abstract**—This article aims to analyze the satisfaction of university students from the perspective of teaching performance, in face-to-face (2019-II) and virtual (2020-I) teaching-learning, due to the health emergency, declared in Peru, by COVID-19. These results will allow the Public University to implement continuous improvement plans in the teaching-learning development of the virtual environment. When performing the comparative analysis, it was determined that the careers that present the greatest satisfaction in 2020 - I, are business administration with 82.97% and systems engineering with 78.07%. Then it was identified that the indicators that present a greater negative variation are "The quality of the development of classes and activities" with 5.88%, and "Treatment of students during class", with 2.49%. With these results it can be indicated that the satisfaction of the students has presented a slight positive variation towards the teaching performance when applying the virtual modality.

**Keywords**—student satisfaction, teaching performance, virtual teaching

### 1 Introduction

The analysis of satisfaction at the university level is a subject that has been widely investigated, however the current global context is immersed, due to the COVID-19 pandemic, therefore it is more than necessary to identify the effects that are occurring in the university teaching and learning process. In [1], the author points out that the progress of a country depends to a great extent on the educational quality offered by universities, which can be measured through student satisfaction.

In the same line of opinion in [2], the author points out that university satisfaction is conceived as a pleasant state that largely depends on the conditions in which professional development takes place. In relation to the teacher and his performance, in [3],

the author points out that there are undoubtedly many factors that are related to university quality, and as such it represents a key and relevant factor for the teaching and learning process.

In this regard, in [4], the author points out that perception studies on teacher performance are very useful, since they contribute to improving teacher professional development, in a situation of competitiveness and technological development.

In relation to the above in [5], the author establishes that the process of evaluating the perception of teacher performance is about carrying out an evaluation of a learning act, fundamentally to understand and transform the professional practices of the teacher to the benefit of student. As indicated in [6], the existence of an evaluation system allows the continuous improvement of educational quality and the detection of relevant aspects to improve.

But, everything cited above is in a context of non-existence of a COVID-19 pandemic, in this regard in [7], the author points out that quickly, almost without realizing it, the pandemic transformed the teaching process, from strongly defined models to almost improvised models very dependent on the internet. In the same line of opinion in [8], the author points out that the pandemic has revealed the weaknesses of the system to adapt face-to-face teaching to virtual mode.

In [9], the author also points out that the universities had to migrate urgently, and from the challenges they were already facing in their face-to-face mode, this hasty transition has subjected them to a stress test, showing today many deficiencies, one of these is the teaching performance under this context.

In this regard, in [10], the author points out that, although technological changes occur at an impressive speed, changes in the routines of the university teacher must be gradually modulated because a deficient use, didactically speaking of technological tools, affects perception of student satisfaction.

In addition, in [11], the author points out that, in this context, the expectations of students who use the virtual modality demand that universities develop an approach towards the quality of education, systematically evaluating the educational model to achieve the greatest level of student satisfaction.

In this sense, the purpose of this article is to analyze the findings of the satisfaction of university students towards teaching performance, when teaching was with the face-to-face modality and when it was changed to the virtual modality, due to the declared health emergency in Peru, by COVID-19. For which, initially, the results obtained from the indicators that make up the variable of teacher performance, by professional school; thus determining the professional school that presents the greatest satisfaction. To later identify in a general way, the indicators with negative variation. Finally, the margin of increase or decrease of satisfaction will be determined.

## **2 Research methodology**

The comparative analysis to determine the satisfaction of the students was carried out in two different academic semesters, in the 2019-II semester, with the face-to-face

modality and the 2020-I semester, when the virtual modality was applied, in a Public University of Peru.

Likewise, the population will be composed of students from the seventh to the tenth cycle of 5 professional schools. On the other hand, the sample under study will be made up of the entire population, since it was possible to apply the data collection instrument, through a survey, to the entire student population, this in order to achieve greater precision in the obtaining results.

It should be noted that in the data collection instrument, the data are dichotomous, that is, the alternatives are dissatisfied and satisfied. As described in Table 1, the research sample is detailed.

**Table 1.** Research population and sample

Population (Students)	2019-II	2020-I
Systems Engineering	149	146
Electronic Engineering and Telecommunications	136	172
Environmental Engineering	147	177
Business Administration	135	155
Mechanical and Electrical Engineering	107	172

The data collected were subjected to a validity analysis using Cronbach's alpha, using the SPSS. Which determined that the coefficient in the 2019-II semester is 0.849 and in the 2020-I semester it is 0.921, according to statistical theory, it means that the data collected presents excellent reliability. Therefore, the research results are presented safely and reliably.

The following figure shows the indicators of teacher performance that have been considered in the satisfaction survey. These indicators are part of the data collection instrument, used and validated in research carried out in the context of the health emergency, as evidenced in [12] and [13]. It should be noted that the application of the data collection instrument was carried out at the end of the academic semesters; this criterion is used with the purpose that the student has a greater spectrum of experiences acquired based on the teaching performance in the context of virtual teaching.

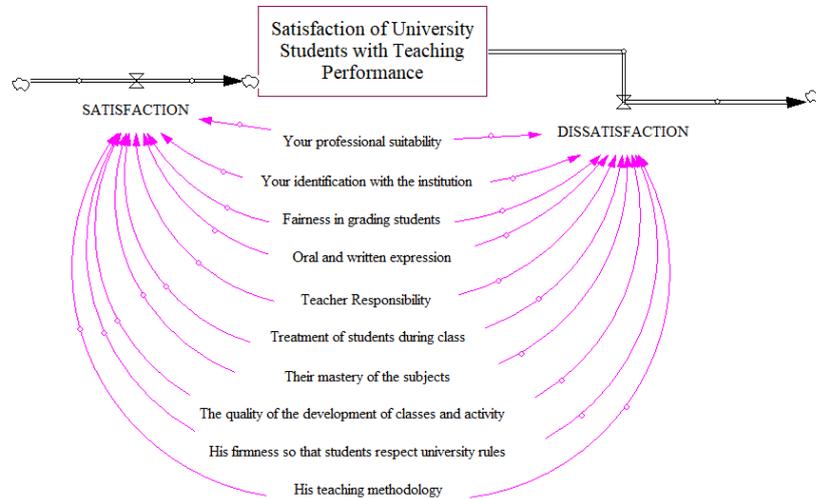


Fig. 1. Modeling according to the students' satisfaction or dissatisfaction perspective

### 3 Results and discussion

#### 3.1 Results of the investigation

In Figure 2, you can see the results of the comparative analysis of the satisfaction of the 10 indicators, for the 2019-II semester and the 2020-I semester.

As can be seen, the business administration career presents the highest percentage of satisfaction with 82.97% in the 2020-I semester and 83.85% in the 2019-II semester. Likewise, the results do not show that the Mechanical and Electrical Engineering degree is the one with the greatest negative variation in satisfaction of 3.96%. While the Systems Engineering career presents the highest positive variation of 7.54%.

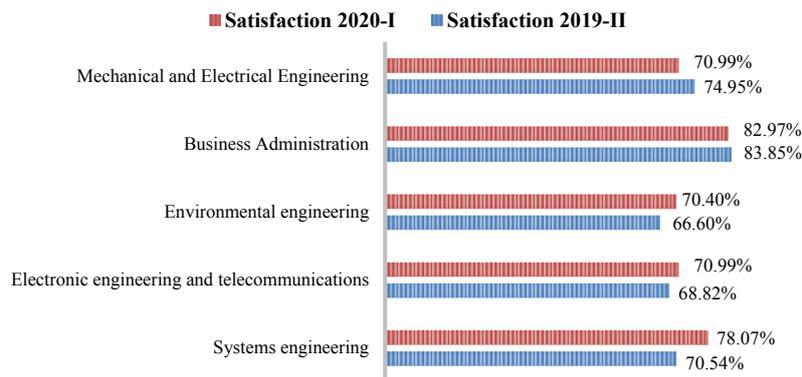


Fig. 2. Satisfaction of teacher performance indicators by professional school

In Figure 3, you can see the comparative analysis of the satisfaction of the 10 indicators belonging to the variable teacher performance, of the 5 professional schools. As can be seen in Figure 3, the indicator that presents a greater positive variation of 9.87%, is the indicator "Teacher's responsibility"; then there is the indicator "His firmness so that students respect university rules", with a positive variation of 5.25%. Likewise, the indicator that presents the greatest negative variation with 5.88%, is the indicator "The quality of the development of classes and activities", followed by the indicator "Treatment of students during class", with a percentage of negative variation 2.49%. From Figure 3 it can be deduced that student satisfaction towards teaching performance presents a slight improvement of 1.73%, when applying the virtual modality.

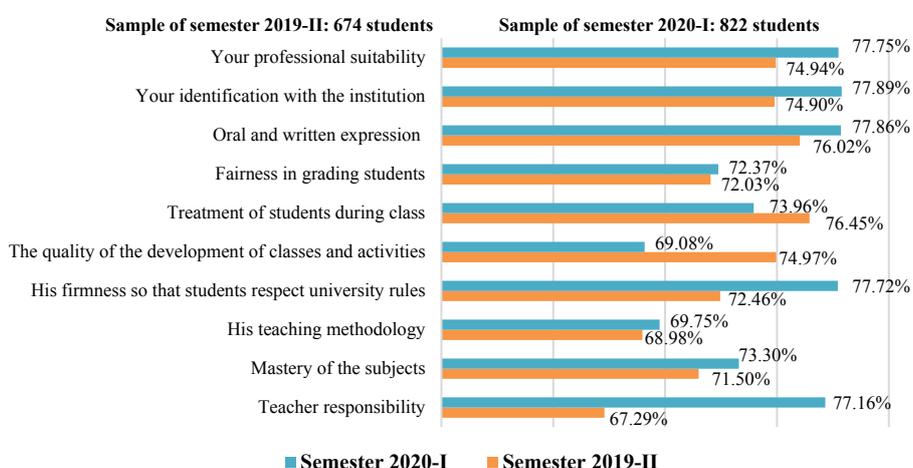


Fig. 3. Satisfaction of the 10 teacher performance indicators

In the following table we will identify the percentage of students who are dissatisfied, with respect to the two indicators that present the greatest negative variation. For this we will take with reference the systems engineering career.

Table 2. Percentage of dissatisfaction of students of the indicators with the greatest negative variation

Results obtained for the Professional School of Systems Engineering				
	Treatment of students during class		The quality of the development of classes and activities	
	Frequency	Percentage	Frequency	Percentage
Dissatisfied	45	30.4	50	33.8
Satisfied	101	68.2	96	64.9
Total	146	100.0	146	100.0

Although the systems engineering school is one of those that presents the greatest satisfaction, when implementing the virtual modality, a significant number of students,

representing 33.8% and 30.4%, are dissatisfied with the indicators that have presented a greater negative variation.

In Figure 4, the causal or influence diagram obtained using the Vensim software is shown, the same as from the entry of the data collected from each of the indicators under study, referring to the sample analyzed during the academic semester 2020-I, evidence that there are significant levels of association between each of the indicators with respect to the perception of satisfaction of teaching performance in the context of virtual teaching. Thus, it can also be seen that the indicator with the lowest contribution or influence on the perception of student satisfaction is the indicator called "Oral and written expression", with a level of 62.4%, while the indicator with the highest contribution is "Treatment of students during class", whose level is 82.4%.

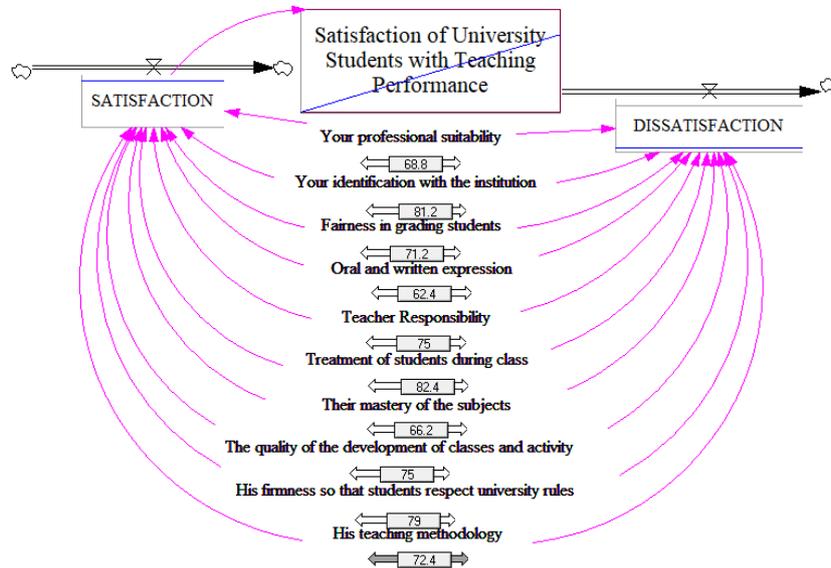


Fig. 4. Variation of the behavior of the variable student satisfaction towards teaching performance

### 3.2 Discussion

The business administration career and the systems engineering career present the highest percentage of satisfaction while the Mechanical and Electrical Engineering career is the one that presents the greatest negative variation in satisfaction from the perspective of teaching performance.

This can be supported by the nature of the systems engineering career, which implies that the teacher, as part of their methodology, uses simulation software for the delivery of their classes, thus complying with the curricular requirements; As indicated in [14], student satisfaction in teaching-learning is highly related to the fact that the teacher

fully complies with what is established in the curricular plan, since this allows the student to feel that he is developing professionally.

Another different scenario occurs, in the Mechanical and Electrical Engineering career, because this career does not have the appropriate tools to carry out its subjects, which mostly involve carrying out mathematical calculations and practical electrical and mechanical activities; As indicated in [15], the satisfaction of students in engineering careers is related to the efficient fulfillment of their practical training during the teaching-learning process.

As it was determined, the indicators that present a greater positive variation are: "Teacher's responsibility" and "His firmness so that students respect university norms". Likewise, the indicators that show the greatest negative variation are: "The quality of the development of classes and activities" and "Treatment of students during class".

Regarding the quality of the classes, in the study of [16], it is pointed out that the causes of dissatisfaction of the students are related to the lack of preparation or updating of the teacher in the use of technological tools that allow the professional development of the student. This arises from the abrupt change from the face-to-face to the virtual modality, since many state universities lack optimal tools for the development of various subjects and this abrupt change has not allowed the correct training, education and adaptation of the teacher. In addition, there is the poor internet connectivity that both teachers and students present, since this new teaching-learning normality often saturates the internet signal, making classes not continuous. As indicated in [17], student satisfaction with teaching performance is related to the quality of the explanation and to understanding efficiently by the student.

An important aspect is the results that show that the percentage of student satisfaction was found to increase slightly during virtual learning in all indicators; This is due to the fact that although it was abruptly to move from the face-to-face to the virtual, the response of the university institution allowed to guarantee the continuity of the educational service, through the implementation of a virtual platform, whose functionality and operation, turned out to satisfy the expected demand for the students. In this regard, in [12], the author points out that the declaration of the state of emergency did not allow the development of aspects associated with the virtual teaching-learning process in a planned and structured way, however the universities made necessary efforts, which led to the implementation of learning environments virtual.

Finally, two indicators of the systems engineering study program (see Table 2) show a decrease in the level of satisfaction, and this result allows the identification of certain deficiencies focused on the performance of the teacher with respect to the interaction with virtual tools, since the lack of training and adequacy of the teacher in the management of this type of environment, are reflected in these two indicators; In this regard, in [13], it is specified that in the systems engineering school the teacher's challenge is greater with respect to the domain and management of virtual environments, since the use of software or computer programs is in itself necessary and essential, which at the same time involve competencies related to the management of information and communication technologies.

## 4 Conclusions

During the research, it was determined that the business administration career presents the highest percentage of satisfaction, with 82.97% in the 2020-I semester, followed by the systems engineering career with 78.07%. Likewise, the indicators that present a greater negative variation are "The quality of the development of classes and activities" with 5.88% and "Treatment of students during class", with 2.49%. With these results it can be indicated that the satisfaction of the students has presented a slight positive variation of 1.73% towards the teaching performance when applying the virtual modality.

To continue improving the satisfaction percentage, it is suggested the implementation of didactic strategies through digital resources, feedback programs, follow-up and monitoring of the integral commitment of the students and the teacher with the teaching-learning process; this process must be associated with the support of the authorities of the public university and of the state itself.

Another important conclusion is that the results are limited to a population made up of students from the seventh to the tenth cycle, in the context of virtual teaching; Under this precision, it is necessary to complement, through further research, the analysis of results for the other population group (students from the first to the sixth cycle), and evaluate how significant the contribution in the results of the perception of satisfaction is of this population not studied with respect to the results shown in this investigation.

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