


## PROFESSORS' PERCEPTIONS AND TEACHING-LEARNING STRATEGIES DURING SOCIAL ISOLATION MOTIVATED BY COVID-19


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### ABSTRACT

The purpose of this text is to identify the main strategies of the teaching-learning process, as well as the perceptions of professors during the period of social isolation in the context of the pandemic generated by Covid-19. The study sample consists of 52 professors from the Administration, Accounting, and Economic Sciences courses, working in four higher education institutions in the southern region of Brazil. The survey carried out through a questionnaire comprising 32 questions, collected the respondents' identification, the perceptions of the teaching process, and the teaching-learning strategies used from the insertion of classes remotely as an alternative in the social isolation period. As data treatment, descriptive statistics, and the *Mann-Whitney statistical test were used*, the analysis is quantitative. The results show that, for 96% of those surveyed, the disciplines took place remotely; 92% indicate pedagogical adaptations, and 76% responded that the institution offered training. The main teaching strategies used in the period of social isolation are: expository classes with the presentation of content on slides (98%); exercises with resolution (90%); case study (69%); and content-oriented research/reading (52%). The statistical analysis shows that professors who used problematization/teaching cases, debates,

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and games believe they have achieved the teaching-learning objectives. In the perception of 54% of professors, classes held remotely do not represent losses in students' teaching-learning process and have achieved their objectives. In general, the results demonstrate adaptation of face-to-face classes to the remote format. The findings suggest the importance of inserting technologies as teaching strategies, regardless of whether the model is face-to-face or not.

**Keywords:** Teaching-learning strategies. Covid-19. Teaching in social isolation.

## 1 INTRODUCTION

The current scenario of higher education in the face of the social isolation generated by the Covid-19 pandemic, a disease caused by a variation of the SARS-CoV-2 coronavirus virus, which has a high potential for contagion, motivated the World Health Organization (WHO) to consider the status of the disease for a pandemic (Arora & Srinivasan, 2020; Sun, Qiu, Huang & Yang, 2020). Besides the health-related aspects, the pandemic has changed the routine of all economic sectors worldwide. The effects on business, income generation and jobs, are affected economic variables, as well as in the educational segment - it is estimated that the pandemic affected about 87% of students (Unesco, 2020).

The advance of the pandemic has caused the world to stagnate virtually. Due to the need for social distance, activities that are more dependent on the flow and concentration of people had an immediate impact, as is the case of face-to-face higher education (Rossoni, 2020). In this context, adaptations from institutions and education professionals were necessary to create teaching-learning strategies to maintain the regularity of teaching activities (Lall & Singh, 2020).

Although intense changes in teaching-learning methodologies have marked the last decade, especially in higher education (Taraban, Rynearson, & Kerr, 2000; Tinajero, Lemos, Araújo, Ferraces, & Páramo, 2012; Hilliger et al., 2020), there were changes and the insertion of distance learning (DE) (Miles, Mensinga, & Zuchowski, 2018), which significantly increased the training of students from various educational segments (Ramdass & Masithulela, 2016).

Higher education institutions (HEIs) are responsible for the spread of knowledge in society, both for the condition of training professionals, who will be transformation agents in companies, as well as for the condition of forming an opinion and new professionals who will be professors. In this sense, HEIs are committed to forming human, cognitive skills and the development of civic competencies (Kruger, Zanella, Barichello, & Petri, 2018; Zanella, Kruger, & Barichello, 2019).

In Brazil in 2019, 8.6 million students were enrolled in higher education. Of these, 71.6% in undergraduate courses in the face-to-face modality, which is equivalent to 6.2 million students, while 76% of enrollments occurred in private educational institutions (Agência Brasil, 2020). The main strategies that differ from classroom teaching are the motivation for reading texts in virtual learning environments, in addition to the students' autonomy in relation to the teaching-learning stages (Amante, 2011).

In the current social context, the face-to-face teaching environment has been affected by government decrees that restrict classes' execution in person. This condition required the HEIs to create teaching strategies to adapt the learning environment to the remote/virtual emergency, similar to the distance education model. The state of Santa Catarina, through Decrees 509/2020 and 525/2020 (Government of the State of Santa Catarina, 2020), established the suspension of face-to-face classes at all levels in the state and the use of platforms to attend the condition of emergency remote education for the continuation of the school calendar, which suggests the use of teaching strategies other than the face-to-face, in order to meet the needs of the teaching structure carried out remotely.

For the educator, understanding the education focused on the student is of paramount importance, which does not represent that the educator plays a less relevant role (Mendoza, Burbano, & Valdivieso, 2019). As in face-to-face teaching, professors continue to have a relevant role in the remote emergency context, as they are essential figures to create, structure, and animate learning experiences. Especially when activities are carried out synchronously, their role as mediators of the teaching-learning process contributes to students' qualification and training (Miles et al., 2018).

The need for remote education to meet the emergency context caused by the Covid-19 pandemic should not be confused with online learning. However, during the crisis period, most institutions and professors had to adapt to the emergency remote teaching, which required more planning and attention in preparing activities, infrastructure and technologies, educational policy, and resources to ensure educational continuity (Barbour et al., 2020).

Given the context presented, the research problem aims to answer: what are the main strategies of the teaching-learning process used by professors during social isolation in the context of the pandemic generated by Covid-19? The purpose is to identify the main strategies of the teaching-learning process, as well as the perceptions of professors during the period of social isolation in the context of the pandemic generated by Covid-19.

The research's importance is justified by its reflections on higher education's educational structure in the current scenario established by the Covid-19 pandemic (Arora & Srinivasan, 2020; Sun et al., 2020). These reflexes motivate educators to adopt new perceptions regarding their role in searching for solutions to remedy learning difficulties caused by remote classes' adaptations (Abmes, 2020). The study sample consists of 52 professors from the Administration, Accounting, and Economic Sciences courses, working in four higher education institutions in the southern region of Brazil, encompassing the universe of 1,510 students. It is considered that these institutions made adaptations to the face-to-face teaching model for the remote emergency model, unlike the federal teaching institutions, which suspended teaching activities in 2020.

The study presents the professors' perceptions in the area of management and business, observing the changes in the learning process and teaching strategies used, considering that face-to-face teaching was affected by the isolation restrictions, requiring adaptations to the virtual environment. Face-to-face classes started to be performed remotely, authorized by the Ministry of Education (2020), in the face of the Covid-19 pandemic. In a short period of adaptation, institutions and professors needed to adjust content and teaching-learning strategies to maintain the schedule of remote emergency classes (Barbour et al., 2020). In this scenario, the study presents as a differential aspect the professors' perception regarding the adaptations of learning strategies in the remote emergency context and the impact of remote classes on the teaching process.

## **2 TEACHING-LEARNING STRATEGIES AND THEIR ASSESSMENTS**

The term "teaching strategies" can be understood as the combination of means used by professors to develop the teaching process linked to activities and the results expected by them (Anastasiou & Alves, 2004). In the articulation of teaching and learning in the classroom, several factors can influence the intended results, among them: conditions of the teaching structure, professors' working conditions, students' socioeconomic conditions, the available resources, and teaching strategies (Mazzioni, 2013; Stobaugh, R., & Everson, K. (2019).

The teaching strategies used by professors daily are another relevant element, which must be developed to sensitize and instigate students in the learning process, highlighting the professor's role and the students with the training (Ali & Syed, 2020). To establish interpersonal relationships with academics, so that the teaching-learning relationship is articulated in a way

capable of satisfying the objectives of the process and that the methods used to instigate the creative development of academics, the relevance of the role of professors stands out to stimulate students' emotions, instigate reflections, and the formation of skills (Silva, 2019). The way the professor plans activities and uses teaching strategies is a relevant factor to condition students' reactions and, consequently, reflects on learning (Oliver, 1999; Oliveira, 2017).

In the literature, evidence of different classifications of learning strategies is found. The most widely used comes from two main strands: a) cognitive; and b) metacognitive (Boruchovitch, & Santos, 2006). Cognitive strategies encompass a family of general methods that academics use to work and understand certain content of classes and texts of the disciplines (Taraban et al., 2000).

Teaching strategies centered on the student or those centered on the professor need to contribute to teaching's cognitive and affective objectives. Teaching strategies for scientific practice, the combination of strategies aimed at experimentation, and the discussion of problems are teaching strategies used to achieve the cognitive and affective objectives of teaching (Halawa, Hsu, Zhang, Kuo, & Wu, 2020, Murray, 2019).

Teaching methodologies must consider that the way the student learns is not an act described as isolated or chosen by chance, without prior knowledge of the contents worked on or the skills necessary for the execution and the objectives to be achieved (Silva, 2019). The strategies known and recommended by education professionals converge with professionals' strategies in other areas, although they may receive different nomenclatures (Oliveira, 2017; Ali & Syed, 2020).

In the face-to-face teaching environment, the focus is on teaching methodologies; differently, in the distance learning environment, the focus is on students and teaching tools (Miles et al., 2018, Lall & Singh, 2020). With these evident differences, the teaching-learning strategies become protagonists in maximizing the result of the teaching-learning process. Also, assessments also need to be resized to the teaching environment's context (Pi, Xu, Liu & Yang, 2020).

The methodologies for assessing student learning are undergoing intense phases of transformation under the pedagogical aspects, as the continuous assessment aims to gradually diagnose and improve students' learning (Prata, 2003). The form of assessment is relevant in higher education since students need autonomy to develop skills and knowledge inherent to training (Lemos, 2011). Still, the development of processes for assessing the performance of students' learning methods using the teaching methodologies used needs to follow technological developments (Pi et al., 2020).

The literature recommends using teaching strategies in different areas of knowledge, especially in adverse moments, when traditional methodologies lack adaptation or implementation. For better visualization, the main teaching-learning strategies in Applied Social Sciences are presented in Table 1.

Table 1  
Main teaching strategies

Strategies	Presentation
Conversational expository lecture	“It is an exhibition of the content, with the active participation of students, whose prior knowledge must be considered and can be taken as a starting point. The professor leads students to question, interpret, and discuss the object of study, based on recognition and confrontation with reality” (Anastasiou & Alves, 2004, p. 79).
Text study	It is the exploration of an author's ideas based on the critical study of a text and/or the search for information and exploration of ideas by studied authors (Anastasiou & Alves, 2004, p. 80).

Portfolio	It is the identification and construction of registration, analysis, selection, and reflection of the most significant productions or identification of the greatest challenges/difficulties in relation to the object of study (Anastasiou & Alves, 2004, p. 81).
Brainstorm	It is a possibility to stimulate the generation of new ideas spontaneously and naturally, allowing the imagination to function. There is no right or wrong. Everything that is raised will be considered, requesting, if necessary, a further explanation from the student (Anastasiou & Alves, 2004, p. 82).
Concept map	It consists of constructing a diagram that indicates the relationship of concepts in a two-dimensional perspective, seeking to show the hierarchical relationships between the concepts relevant to the content structure (Anastasiou & Alves, 2004, p. 83).
Text study or directed study and guided classes	It allows the students to critically situate themselves, extrapolate the text to the lived reality, understand, and interpret the proposed problems, solve difficulties of understanding and propose alternative solutions, in addition to studying under the guidance and directivity of the professor, aiming to solve specific difficulties. It is necessary to be clear: what the session is, for what and how it is prepared (Anastasiou & Alves, 2004, p. 84; Petrucci & Batiston, 2006, p. 279-280).
Solving problems and exercises	It is facing a new situation, requiring reflective, critical and creative thinking based on the data expressed in the description of the problem; it demands the application of principles, laws that may or may not be expressed in mathematical formulas. Study through concrete and practical tasks aims to assimilate knowledge, skills, and habits under the professor's guidance (Anastasiou & Alves, 2004, p. 86; Marion & Marion, 2006, p. 46).
Teaching in small groups	It is a particularly valid strategy in large classes, as it consists of separating the class into small groups to facilitate the discussion. In this way, the students will awaken the initiative to research, to discover what they need to learn (Petrucci & Batiston, 2006, p. 278-279).
Seminar	It is a space in which ideas must germinate or be sown. Therefore, a space where a group can discuss or debate themes or problems brought up for discussion (Anastasiou & Alves, 2004, p. 90).
Case Study	It is the detailed and objective analysis of a real situation that needs to be investigated and is challenging for those involved (Anastasiou & Alves, 2004, p. 91).
Simulated jury	It is a simulation of a jury in which, based on a problem, defense and accusation arguments are presented. It can take the group to analyze and assess a fact proposed with objectivity and realism, to the constructive criticism of a situation, and to the group's dynamism to deeply study a real theme (Anastasiou & Alves, 2004, p. 92).
Symposium/panel/lectures/forum	It is the meeting of lectures and short lectures presented by several people (two to five) on a subject or on various aspects of a subject. Enables the development of social skills, research, expands experiences on a specific content, develops skills to establish relationships (Anastasiou & Alves, 2004, p. 93; Marion & Marion, 2006, p. 42; Petrucci & Batiston, 2006, p. 288-289).
Discussion and debate	It suggests to students the reflection about knowledge obtained after a reading or exhibition, allowing students to formulate principles in their own words, suggesting their application (Marion & Marion, 2006, p. 42-44).
Workshop (or laboratory)	It is the gathering of a small number of people with common interests to study and work for the knowledge or deepening of a topic under a specialist's guidance. It makes it possible to learn to do something better by applying previously acquired concepts and knowledge (Anastasiou & Alves, 2004, p. 96).
Office, laboratory or model company	It provides the student with contact with information technology, the reflexes of bad information generated, the countless possibilities for errors, and the consequent successes (Petrucci & Batiston, 2006, p. 286-288).
Virtual teaching	Also known as Distance Education, it is a teaching modality through the need to use technological tools to impact academics efficiently and positively in the learning process (Ramdass & Masithulela, 2016).

Exhibitions, excursions, and visits	Student participation in the elaboration of the fieldwork plan; possibility of integrating several areas of knowledge; insertion of students in society through activities integrated with companies; visualization, by the student, of theory in practice; development of the students' creative thinking and critical view of the reality in which they are inserted (Marion & Marion, 2006, p. 37-38, Petrucci & Batiston, 2006, p. 276-277).
Business games	Students become agents of the process; skills are developed in decision making at the administrative level, experiencing interconnected actions in environments of uncertainty; it allows strategic and tactical decisions to be taken in the management of company resources, whether material or human (Marion & Marion, 2006, p. 50, Petrucci & Batiston, 2006, p. 281-283).

Source: Adapted from Mazzioni (2013).

The researched authors report that the strategies presented are not unique and absolute. They can be adapted using integrated tools to complement them, according to the need identified by the professor in the process of recognizing learning by academics (Mazzioni, 2013). The chosen teaching strategies assist in the operationalization of the results sought (Liu, Geertshuis & Grainger, 2020). In this scenario, professors must formulate their strategies to meet diverse needs and maximize the teaching-learning process results.

Baartman, Bastiaens, Kirschner & Vleuten (2007) indicate the importance of implementing a Skills Assessment Program, which may consist of a combination of different assessment methods, linked to the definition of the necessary criteria to analyze the quality of the teaching-learning relationship (Dierick & Dochy, 2001, Baartman et al., 2007). It is also noteworthy that using a single form of assessment is insufficient to verify and validate the skills of academics (Gomes et al., 2012).

In this sense, it is necessary to categorize the assessment strategies in the virtual environment in five types of approach: pedagogy, didactics, ethics, psychology, and technology (Prata, 2003): a) pedagogy is related to the organization and structuring learning; b) didactics are related to the way and means in which knowledge is passed on to academics; c) ethics is related to ethical problems related to didactics and teaching technology; d) psychology refers to the definition of the academic's profile and emotional follow-up; and e) technology refers to the logistics required to meet the requirements of the assessment environment (Baartman et al., 2007).

New technologies and access to information have allowed countless advances in the educational environment, both in the strategic position of seeking to understand the transformations of the world and to produce pedagogical knowledge about it, in addition to assisting users in the most technological scenario (Alò, Castillo, Marín Vial, & Samaniego, 2020). The increasing use of distance learning methodologies has meant that learning models needed adaptations. Consequently, the assessment methodologies also needed these adjustments (Gomes et al., 2012). This movement has motivated the emergence of innovative assessment strategies, most of them in the digital environment (Amante, 2011). However, assessing the activities carried out in groups, the assessment carried out among peers, and the different forms of self-assessment need attention and differentiated assessment criteria between the classroom and distance education environment (Arora & Srinivasan, 2020; Lall & Singh, 2020).

Silva's study (2019) highlights the main teaching strategies appropriate to higher education didactics. Among them, they highlight: Expository Class, Questions and Answers, Directed Study, Didactic Sheets, Problem Solving Method, Project Method, Group Work, On-site Study, Games, Role Playing, Seminar, Debate, Discovery Method, and Didactic Units. Such strategies are categorized as individual, collective, and mixed, as well as indicating that the use of these teaching strategies is associated with didactic elements: planning, content organization, teaching, and assessment strategies.

The research by Arora and Srinivasan (2020) demonstrated the impacts of the block on the teaching-learning process, considering the analysis of the adoption of virtual classes or the reason for not adopting them. The study considered the responses of 341 professors from higher education institutions. The results indicate that the lack of awareness is the main reason for those who did not adopt distance learning, followed by lack of interest and doubts about the usefulness of virtual classes, in addition to the lack of interaction due to connectivity problems, being pointed out as a disadvantage of virtual classes. The study also suggests ways to overcome the challenges and reasons behind higher education professors not adopting or using distance learning.

In general, it can be highlighted that teaching-learning strategies, as well as the independent assessment process of the context of classroom teaching or emergency remote teaching, are impacted by the emergence of new learning technologies, requiring adaptations and the interaction of students, professors, aiming to make learning attractive and appropriate to the students' social context.

### **3 METHODOLOGICAL PROCEDURES**

This study is classified as descriptive, carried out through a survey with a mixed approach, which aims to identify the adaptations of the strategies in the teaching-learning process, as well as the professors' perceptions during social isolation in the context of the Covid-19 pandemic.

The research was carried out with educational institutions that, although not in person, continued with the pedagogical activities in the face of the Covid-19 pandemic. For reasons of access to the respondent professors, the questionnaire was applied in four higher education institutions: a community university divided into two campuses and three individual private campuses. As for the geographical location, two are located in western Santa Catarina, and two in southwest Paraná.

Participants were obtained from a survey carried out through a questionnaire (Google Forms) made available online, disseminated by e-mail to professors, by sending it with the collaboration of the four educational institutions' course coordinators. Also, the questionnaire application was restricted to 91 professors who work in courses in the area of management and business at these four educational institutions. Therefore, the respondents' profile is characterized by professors from the Administration, Accounting, and Economic Sciences courses who work in at least one discipline in classroom undergraduate courses.

The instrument applied was divided into three blocks, as follows: Block I - Identification of respondents, composed of 11 questions for categorizing the sample. Block II - Professors' perceptions in the teaching-learning process, composed of 15 questions measured on a Likert-type *scale*, which vary in five points: from "1 = Totally Disagree" to "5 - Totally Agree". Finally, Block III - Teaching-learning strategies, is composed of six questions, two of which are open, allowing their description. The questionnaire was designed and validated by the researchers, using five professors as pre-test and validation. After the adjustments, the questionnaire was applied to the sample of institutions that maintained emergency remote education, justifying the selection of the HEIs. In the four educational institutions, the number of academics enrolled in business courses was identified. The Administration course is offered by the four institutions and includes a total of 698 students, while the Accounting course, which the four institutions also offer, has a total of 711 students. Finally, the Economic Sciences course has 101 students enrolled, being offered only by the community education institution located in western Santa Catarina. Therefore, it is possible to identify the total of 1,510 academics directly

impacted by the social distance measures caused by the Covid-19 pandemic. Table 2 shows the characterization of the respondent professors who make up the study sample.

Table 2  
**Respondents' characterization**

<b>Gender</b>	<b>Freq.</b>	<b>%</b>	<b>Time in higher education</b>	<b>Freq.</b>	<b>%</b>
Male	26	50%	up to 1 year	4	8%
Female	26	50%	between 2 to 5 years	11	21%
Total	52	100%	between 6 to 10 years	17	33%
<b>Highest degree</b>	<b>Freq.</b>	<b>%</b>	between 11 to 15 years	6	11%
Specialization	12	23%	16 years or more	14	27%
Master's Degree	11	21%	Total	52	100%
Doctorate	29	56%	<b>Weekly teaching hours</b>	<b>Freq.</b>	<b>%</b>
Total	52	100%	up to 20 hours	27	52%
<b>Age</b>	<b>Freq.</b>	<b>%</b>	between 21 and 30 hours	7	13%
up to 30 years old	8	15%	between 31 and 40 hours	18	35%
between 31 and 40 years old	13	25%	Total	52	100%
between 41 and 50 years old	24	46%	<b>Number of disciplines</b>	<b>Freq.</b>	<b>%</b>
Over 51 years old	6	12%	between 1 and 2 disciplines/components	11	21%
61 years or older	1	2%	between 3 and 4 disciplines/components	18	35%
Total	52	100%	between 5 and 6 disciplines/components	18	35%
<b>Acting courses</b>	<b>Freq.</b>	<b>%</b>	between 7 and 8 disciplines/components	5	10%
Administration	9	17%	Total	52	100%
Accounting	20	38%	<b>Do you have courses in distance learning?</b>	<b>Freq.</b>	<b>%</b>
Economic Sciences	1	2%	No	36	69%
Administration and Accounting	20	38%	Yes, 1 discipline/component	7	13%
Accounting and Economic Sciences	1	2%	Yes, 2 to 3 disciplines/components	9	17%
Work in the three courses	1	2%	Total	52	100%
Total	52	100%			

**Note.** % = Percentage; Freq = Relative frequency;  
 Source: Research data.

Data collection through a questionnaire was carried out between May 4 and 18, 2020, considering the interruption of classroom teaching activities, according to federal and state decrees. 52 valid responses were obtained from 91 possible respondents from the population that fit the research profile, which characterizes a sample of 57% of the respective professor population.

For data analysis, descriptive statistics and statistical tests were used. The minimum, maximum, mean, mode, median, and standard deviation of the sample were analyzed in descriptive statistics. At the same time, for the statistical test, the Mann-Whitney U test was used because the sample groups are categorized into two samples. These are independent of each other, considering the guidance of Fávero & Belfiore (2017), as an appropriate technique for the context of the sample studied.

#### 4 ANALYSIS AND INTERPRETATION OF RESULTS

Observing the characterization of the sample of 52 professors in the study, 71% have more than six years of experience in teaching in higher education, as well as 69% working only with face-to-face teaching, 56% are doctors and 70% have between three and six

components/disciplines in the current semester 2020/1. To contextualize the teaching-learning practices used by professors in educational institutions, initially, it is necessary to discuss the findings of two research questions.

The first of them had the objective of identifying the progress of the activities of the Administration, Accounting, and Economic Sciences courses, aiming to identify if the educational institutions had maintained the classes regularly remotely. It was asked: "From the social isolation, was it possible to maintain the activities of all your components/disciplines?". This question sought to show whether any discipline or component considered practical (such as the use of laboratories, for example) had to be interrupted. Among the 52 responses obtained, 96% of those surveyed stated that all of their disciplines/activities are taking place remotely, only two respondents said that only theoretical classes were maintained. Practical classes were suspended, thus making a total of 4% of respondents.

The second question asked to identify the progress of teaching activities in the researched institutions was: "With the context of social isolation and the suspension of classroom teaching activities, indicate the alternatives that identify the reality of your components/disciplines) in the educational institution you work". For this question, respondents could choose more than one option simultaneously. Thus, 92% of respondents reported that it was possible to maintain activities and classes remotely, with pedagogical adaptations; 76% responded that the institution offered pedagogical training and instruments to adapt classes remotely; and 40% of the professors surveyed needed to adapt themselves in forwarding activities to students, aiming to validate the workload of the discipline/curricular component. Finally, 4% stated that the practical activities were suspended, and the theoretical classes were adequate for the institution's virtual environment.

Table 3 shows the values obtained in the professors' perception regarding the adequacy of classes in the context of the suspension of face-to-face activities. The specifications presented in Table 2 allow to identify the variants of each teaching perception based on the answers obtained through a 5-point Likert scale, ranging from "1 = Totally Disagree" to "5 - Totally Agree", observing the mean and the standard deviation of the responses obtained.

The research revealed that professors identified the perception "PD6 - Remote classes show the possibility of adapting teaching methodologies" with the highest mean among all assessed professor perceptions, reaching a mean of 4.10, with a mode of 5. The second teaching perception that presented the highest mean was "PD7 - With the adaptations made, I was surprised by the possibility of technologies, and I quickly learned pedagogical alternatives", which obtained a mean of 4.00 with mode 4, with the lowest standard deviation between the assessed perceptions. The findings reveal that the professors in the sample identified remote classes as a new teaching possibility and had no difficulties implementing them, even perceiving them as pedagogical alternatives.

Regarding the professors' perceptions with less influence in the teaching-learning process, "PD3 - One of the limitations is internet quality, I had to improve access to avoid harming activities", with a mean of 2.48 and mode 1. The result shows that, in general, professors have compatible internet for remote classes. However, it is not possible to generalize this fact, as this was the question that obtained the largest standard deviation, which can also show difficulties. The second teaching perception that was less influential in the view of the researched professors was "PD1 - I felt difficulties in adapting the contents and the remote form of the classes", with a mean of 2.52 and a relatively low standard deviation, as observed in Table 3, showing that there were no difficulties in adapting the face-to-face classes to the remote emergency format.

Another aspect observed in Table 3 refers to the condition "PD8 - Remote classes will allow reaching the planned objectives for the components/disciplines," with a mean of 3.83, median of 4, and standard deviation of 1.150, which shows the perception that there may be

losses in terms of the objectives of the teaching-learning process. This questioning is related to “PD5 - With the adaptations of classes and activities remotely, there will be no losses in the teaching-learning process,” which obtained a mean of 3.08, mode 3, and standard deviation of 1.218, corroborating with the perception that the context of the adaptations of the remote classes makes it possible to carry out the activities. However, 46% show that there will be losses in the teaching-learning process and that they will hinder the implementation of the proposed objectives for the components/disciplines.

Table 3  
**Perceptions in relation to the teaching-learning process**

ID	Description	Minimu m	Maximu m	Mean	Mode	Median	Standard Deviation
PD 1	I felt difficulties in adapting the contents and the remote form of the classes.	1	5	2.52	2	2	1.196
PD 2	The biggest difficulty is the lack of student interaction, I noticed a reduction in participation, and this frustrates me.	1	5	3.27	4	4	1.315
PD 3	One of the limitations is the quality of the internet. I had to improve access so as not to hinder activities.	1	5	2.48	1	2	1.540
PD 4	Remote classes reduced student participation and made learning difficult to perceive.	1	5	3.27	4	4	1.374
PD 5	With the adaptations of classes and activities remotely, there will be no damage to the teaching-learning process.	1	5	3.08	4	3	1.218
PD 6	Remote classes show the possibility of adapting teaching methodologies.	1	5	4.10	5	4	1.015
PD 7	With the adaptations made, I was surprised by the possibility of technologies and quickly learned pedagogical alternatives.	1	5	4.00	4	4	1.010
PD 8	Remote classes will allow achieving the planned objectives for the components/disciplines.	1	5	3.83	5	4	1.150

**Note.** ID - Identification, PD = Professors' Perceptions.  
 Source: Research data.

The statistical variables of mean, median, minimum, maximum, maximum, and standard deviation were analyzed to explore the findings regarding the professors' perceptions in relation to academics in the teaching-learning process. Table 4 shows the professors' perceptions of students. Table 4 discusses the professors' perceptions regarding students, based on the responses obtained through a 5-point *Likert* scale, ranging from “1 = Strongly disagree” to “5 - Strongly agree”. That is, how professors observe student participation and its relationship in the teaching-learning process during the Covid-19 pandemic.

The perception "PA2 - The biggest difficulty is the lack of interaction, not everyone likes to participate with image and speech" was the only one with a mean higher than four points, reaching 4.02, showing that some academics do not activate their cameras during remote classes and/or do not participate in the debates or question their doubts during the class. This indication

demonstrates that the model of the classes remotely and the lack of interaction of the students becomes one of the main difficulties perceived by the professors of the sample, especially considering the routines of classroom teaching, to which most professors were used to.

The second teaching perception in relation to students with the highest mean was “PA3 - One of the limitations is quality of the internet, sometimes students do not have access or have limited access”, which obtained a mean of 3.96. This result is opposite to the teaching perception “PD3 - One of the limitations is internet quality, I had to improve access to avoid harming activities” in Table 3. In other words, in professors' perception, their internet access is considered better than students' access.

Table 4  
**Perceptions in relation to students**

ID	Description	Minimum	Maximum	Mean	Mode	Median	Standard Deviation
PA1	The students found it difficult to adapt to the content and the remote form of the classes.	1	5	3.38	4	4	0.973
PA2	The biggest difficulty is the lack of interaction, not everyone likes to participate with image and speech.	1	5	4.02	4	4	0.980
PA3	One of the limitations is the quality of the internet, sometimes students do not have access or have limited access.	1	5	3.96	4	4	1.028
PA4	Remote classes reduced student participation and, even with the activities carried out, there was a reduction in the quality of deliveries.	1	5	3.10	4	3	1.225
PA5	With the adaptations of classes and activities remotely, there will be no damage to the teaching-learning process.	1	5	3.02	4	3	1.213
PA6	Remote classes show the possibility of adapting teaching methodologies and students have adapted easily.	2	5	3.67	4	4	0.964
PA7	Remote classes will allow students to meet the planned objectives for the components/disciplines.	1	5	3.65	4	4	1.046

**Note.** ID - Identification, PA = Professors' perceptions in relation to students.

Source: Research data.

The professor perception in relation to students “PA5 - With the adaptations of classes and activities remotely, there will be no damage to the teaching-learning process” obtained the lowest mean among the surveyed perceptions (3.02). This result indicates that, in the professors' view, the remote classes do not fulfill the same teaching-learning objectives as the face-to-face classes. The second professor perception with the lowest mean was “PA4 - Remote classes reduced student participation. Even with the activities carried out, there was a reduction in the quality of deliveries”, with a mean of 3.10. This result demonstrates that the remote classes did not reduce the frequency/participation of students, nor was there any perception of a reduction in the quality of the activities delivered by the students.

The research instrument also questioned professors about teaching-learning strategies used during remote classes. According to a study by Mazzioni (2013), eight strategies discussed in the

literature were listed so they could indicate which strategies are being used in the context of classes held remotely.

Table 5 shows the relationship between the professors' perceptions in relation to the impacts of Covid-19 in the teaching-learning process with the teaching strategies used. To perform the *Mann-Whitney* test in Table 5, the question was used: "In general, considering the general context of Covid-19, what is your assessment in relation to the damage to the teaching-learning process by students?". The result of this questioning was related to the eight teaching-learning strategies listed by the professors.

The results of the *Mann-Whitney* test in Table 5 show statistically significant relevance between the teaching strategies "5 - Problematization/analysis of teaching cases", "7 - Debates (group discussions)" and "8 - Quiz (use of games)". This means that the professors who indicated that they use such teaching strategies believe that the losses of Covid-19 in the teaching-learning process are irrelevant, that it will be possible to replace the content and achieve the desired objectives.

Table 5  
Teaching strategies used

Teaching Strategies in Remote Classes	Ranking Mean	Sum of Classifications	<i>Mann-Whitney U</i>	Z	Sig.
<b>Teaching Strategy 1 - Lectures with the presentation of content in slides</b>					
No	31.00	31.00	21.00	-0.314	0.753
Yes	26.41	1,347.00			
<b>Teaching Strategy 2 - Practical exercises with resolution</b>					
No	28.90	144.50	105.50	-0.391	0.696
Yes	26.24	1,233.50			
<b>Teaching Strategy 3 - Case study (practical cases)</b>					
No	25.91	414.50	278.50	-0.198	0.843
Yes	26.76	963.50			
<b>Teaching Strategy 4 - Analysis of data or reports available for analysis</b>					
No	25.58	767.50	302.50	-0.534	0.593
Yes	27.75	610.50			
<b>Teaching Strategy 5 - Problem/analysis of teaching cases</b>					
No	21.39	577.50	199.50	-2.651	<b>0.008*</b>
Yes	32.02	800.50			
<b>Teaching Strategy 6 - Research/guided reading and directed studies on the content</b>					
No	23.30	536.00	260.00	-1.42	0.156
Yes	29.03	842.00			
<b>Teaching Strategy 7 - Debates (group discussions)</b>					
No	19.57	567.50	132.50	-3.903	<b>0.000*</b>
Yes	35.24	810.50			
<b>Teaching Strategy 8 - Quiz (use of games)</b>					
No	21.83	720.50	159.50	-3.084	<b>0.002</b>
Yes	34.61	657.50			

**Note.** \* significance at the 5% level.

Source: Research data.

In general, as there was a possibility to indicate more than one teaching-learning strategy used, the results show that, in the teaching-learning process of professors who work in the Administration, Accounting, and Economic Sciences courses, the most used strategies are:

- (i) Expository classes with the presentation of content in slides - 98%;

- (ii) Practical exercises with resolution - 90%;
- (iii) Case study (practical cases) - 69%;
- (iv) Analysis of data or reports available for analysis - 40%;
- (v) Questioning/analysis of teaching cases - 44%;
- (vi) Guided research/reading and directed studies on the content - 52%;
- (vii) Debates (group discussions) - 42%;
- (viii) Quiz (use of games) - 37%.

In addition to the eight strategies described in Table 5, professors could indicate other strategies or tools used in their remote classes. Some of the answers mentioned were: “*use of Excel spreadsheets*” (three mentions); “*Remote participation of guests/external professionals*” (two mentions); “*Concept maps*” (two mentions); “*Google tools*” (two mentions); “*Kahoot*” (two mentions). In addition to these, a single mention was made: “*distribution/drawing of questions for debates and justifications for the answers*”; “*Research with companies, through WhatsApp, to collect information*”; “*Assembly of manuals for parameterization with step by step, before this was passed in practice*”, and “*complementary YouTube videos*”.

Another observation evidenced in this research was in relation to the means of assessment, which is a fundamental stage of the teaching-learning process. Therefore, it was asked about what forms of assessment are being used during the pandemic and, subsequently, the perception of the assessment system used was questioned, whether it met the expectations of teaching-learning, whose scale measure was “1 - Totally insufficient” and “5 - Totally sufficient”. Table 6 lists the professors' perception of Covid-19's impacts on the teaching-learning process using the assessment strategies.

Table 6  
Assessment strategies used

Assessment Strategies in Remote Classes	Rank Mean	Sum of Classifications	Mann-Whitney U	Z	Sig.
<b>Assessment Strategy 1 - The assessments have been adapted for activities with resolution using consultation</b>					
No	27.75	610.50	302.50	-0.588	0.556
Yes	25.58	767.50			
<b>Assessment Strategy 2 - The assessments were adapted, and I used more descriptive questions</b>					
No	24.79	768.50	272.50	-1.141	0.254
Yes	29.02	609.50			
<b>Assessment Strategy 3 - Assessments took place normally, even if remotely</b>					
No	25.57	895.00	265.00	-0.743	0.458
Yes	28.41	483.00			
<b>Assessment Strategy 4 - The assessments took place remotely using technologies (system shuffles questions, changes the order, and limits returning to questions)</b>					
No	20.37	550.00	172.00	-3.552	<b>0.000*</b>
Yes	33.12	828.00			

**Note.** \* significance at the 5% level.

Source: Research data.

The Mann-Whitney test results in Table 6 show statistically significant relevance among the assessment strategy “4 - The assessments took place remotely with the use of technologies (system shuffles questions, changes the order and limits returning to the questions)”. This result indicates that the professors who used this assessment strategy consider it to be the one with the

greatest chance of sufficiently attending the teaching-learning assessment process since the relationship was significant between strategy 4 and the relationship that the process met in a “totally sufficient” way.

As for the use of the assessment strategies of the teaching-learning process “1 - The assessments were adapted for activities with resolution using consultation”; it was identified that 58% of professors indicated this format of use; another 40% indicate using “2 - The assessments were adapted and I used more descriptive questions”; for 33% of professors, “3 - The assessments took place normally, even if remotely”; and 48% indicate that “4 - The assessments took place remotely using technologies (the system shuffles questions, changes the order and limits returning to the questions)”. For this questioning, professors could select more than one option or, still, describe which assessment strategies were used and were not mentioned in the questionnaire.

The analysis made it possible, through the answers to one of the descriptive questions, to identify the greatest difficulties of professors in relation to classes and teaching activities in the process of social isolation, such as the lack of interaction and/or participation of students, representing the perception of 33% of the professors' sample, being one of the main difficulties noted in the context of social isolation in the execution of classroom teaching carried out remotely.

As for the general context imposed by Covid-19, 46% of the sample's professors evidence the perception that there will be losses in the students' teaching-learning process (considered as relevant), considering that it will not be possible to restore and achieve the desired objectives, while another 54% consider it irrelevant and that there will be no losses in the students' teaching-learning process, making it possible to replace and achieve the desired objectives. Such results corroborate with the study by Barbour et al. (2020), suggesting that most professors understand as possible the execution of teaching activities in a remote emergency manner without major losses in the learning process. These findings are representative, especially when it is observed that not all professors had experiences with the emergency remote teaching model and that the need for the use of technologies imposed by the pandemic will contribute to innovations in the teaching-learning strategies used by management and business professors, regardless of the face-to-face or remote model.

## **5 FINAL CONSIDERATIONS**

This study aimed to identify the adaptations of the strategies of the teaching-learning process, as well as the professors' perceptions during the social isolation in the context of the pandemic generated by Covid-19, considering the sample of professors of the courses in the management area (Administration, Accounting, and Economic Sciences).

The results indicate the professors' perceptions in relation to their performance during social isolation and the execution of face-to-face classes remotely. The results show the perception of professors as to the possibility of adapting teaching methodologies. With these adaptations, they were surprised by the possibilities of the insertion of technologies, just as they could be quickly adapted pedagogically to the subjects.

As for the perception of professors in relation to students, the results indicate that the greatest difficulty encountered in remote classes was interaction, as not all students participate with video and speech during classes, giving the impression that the activity was restricted to some students in the class. Another perception of professors in relation to students is the limitation of students' internet quality, making remote access and active participation in classes difficult.

The professors' teaching-learning strategies were also observed, and which of these converge with the objective of achieving the discipline's objectives. Among the strategies used, the main ones are highlighted: (i) expository classes with the presentation of content in slides - 98%; (ii) practical exercises with resolution - 90%; (iii) practical case studies - 69%; and (iv) research/guided reading and directed studies on the content - 52%. In this sense, the research showed that professors who used problematization/analysis of teaching cases, debates (group discussions), and quizzes (use of games) believe they have achieved the teaching-learning objectives. Regarding the assessment process, professors who used technologies (the system scrambles questions, changes the order, and limits returning to questions) also noted that the assessment process achieved the expected objectives.

The study not only contributes to the literature on the teaching-learning process of business courses (Administration, Accounting, and Economic Sciences), but also contributes to studies related to the Covid-19 theme that affected people's behavior worldwide, as the challenges posed by social distance also affected face-to-face education. In this sense, the study weighs higher education professors' perceptions, showing that new learning alternatives and the use of technologies can be quickly inserted and adapted to the teaching-learning process. The possibility of interaction and external participation (guests) was also observed as a teaching strategy facilitated by the remote teaching model. The perceptions presented suggest that this pandemic period will contribute to innovations in teaching-learning strategies, especially regarding the use of technologies by management and business professors, regardless of the face-to-face or remote emergency model.

For future research, it is suggested to assess not only the impacts left by Covid-19, but also new teaching-learning and teaching assessment tools that will start to be used from the pandemic and, also, which ones will be present in the post-pandemic period. This is because several technologies and teaching-learning methodologies began to be used and adapted by professors of classroom teaching in this period.

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