EXPLORING ASPECTS RELATED TO THE LEARNING OF BUSINESS STUDENTS DURING EMERGENCY REMOTE EDUCATION

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ABSTRACT

In this study, we sought to analyze the positive and negative aspects concerning the perceived learning of students who remotely entered programs in the Business field of a public higher education institution in Rio Grande do Sul. Thus, an online questionnaire was applied to 50 students of the Administration, Accounting, and Economic Sciences programs. The quantitative approach of the study allowed us to show that the students who participated in the study generally perceived their learning as sufficient at the end of the initial experience with emergency remote education. The results also showed that the pedagogical aspect was negatively and positively related to learning, highlighting the teaching methods used by professors (positive relationship) and the reduced or non-existent interaction with professors (negative relationship). The study identifies the pedagogical aspect, focusing on the professors and their teaching strategies as an influencer of learning during emergency remote education. The findings also reinforce the importance of student support and preparation for using technologies in education, the need for continuing education for professors, and rethinking the teaching practices, incorporating technological didactic resources into post-crisis education. The evidence also points to the need to adopt an approach combining face-to-face and distance education (hybrid education) as a learning facilitator, seeking quality teaching and developing knowledge, skills, and attitudes necessary for student education.

Keywords: Learning. Students. Business field. Emergency Remote Education.

1 INTRODUCTION

On the last day of 2019, while the world population was preparing for the arrival of the new year, the World Health Organization (WHO) was officially informed by the Chinese government about the existence of a pneumatic disease of unknown cause in the city of Wuhan – China (Carbinatto, 2020). A silent pandemic with unimaginable proportions was forming. In March of the following year, the WHO communicated to the world population about the pandemic caused by the Coronavirus (Sars-Cov-2), as published by the Open University System of the Unified Health System (2020).

The COVID-19 pandemic, as it came to be called, led the Ministry of Health to recommend implementing several social distancing measures, including suspending face-to-face classes at all educational levels (Ministério da Educação, 2020). With the advance of the pandemic and the lack of perspective for the return of face-to-face activities, Brazilian Higher Education Institutions (HEIs) adopted emergency remote education (ERE) in circumstances of the crisis (Conselho Nacional de Educação, 2020). In ERE, academic activities previously conducted face-to-face were migrated to the remote format, occurring synchronously and asynchronously through digital resources (Hodges et al., 2020).

In this new reality, applied temporarily, the flexibility of teaching and learning anywhere and at any time has made technology a fundamental tool for the continuity of the school year (Rocha, 2020). However, its use occurred abruptly and without proper planning. Technology, used as a tool to support face-to-face classes and complement traditional learning, quickly assumed a prominent role in the teaching-learning process, momentarily operationalized entirely remotely (Nogueira et al., 2020).

The ERE was put into practice without the *expertise* and preparation necessary due to the urgency in decision-making by the HEIs, disregarding the didactic-pedagogical and technological aspects fundamental to the distance education modality (Carreira et al., 2023; Gusso et al., 2020). Learning depends on several variables beyond the professors' knowledge to plan, conduct, and teach their classes. Therefore, it is essential to identify factors that interfere with the teaching-learning process and understand what influences the student's ability to learn (Gil, 2020).

Information and Communication Technologies (ICTs) in education help in teaching-learning, regardless of the teaching modality (Soares et al., 2021). This occurs because the activities proposed through ICTs allow students' active participation and engagement in achieving educational objectives (Nasu, 2019). Therefore, in addition to helping students construct their learning, ICTs can improve academic performance, provided they are used efficiently (Gaviria et al., 2015).

However, most HEIs adopted the ERE without the necessary planning and disregarding the didactic-pedagogical and technological aspects this modality requires (Gusso et al., 2020). Failure to comply with these factors can make teaching ineffective in achieving its objectives. The weaknesses of ERE include access difficulties and issues with the internet, the teaching methods used, lack of appropriate study environment, unpreparedness for the use of ICTs, lack of *face-to-face, student engagement*, and other limiters (Dosea et al., 2020; Lassoued et al., 2020).

However, research has indicated the benefits of this teaching modality, such as flexibility of study schedules, reduction of expenses, use of active methodologies by professors, and student autonomy in the learning process, among others (Silva et al., 2020; Soares et al., 2021). With the reinvention of professors working in education, the adoption of synchronous classes through videoconferencing platforms and their recording allowed students to attend the class again and seek an understanding of the content addressed, which does not occur in face-to-face education (Agnez, 2021).

Although several researchers worldwide seek to evaluate the consequences of ERE, there is still room for further research (Sangster et al., 2020), especially concerning learning and

academic performance (Soares et al., 2021). Furthermore, it is necessary to understand the obstacles and benefits of teaching modalities that use technologies in education (Silva et al., 2020).

Considering this space, seeking to fill the gap about variables that may influence the perception of higher education students regarding their learning (Bach et al., 2014) and focusing on the current scenario of challenges and transformations in education due to ERE, which demands research on student learning and performance from the changes that have occurred (Sangster et al., 2020), the study sought to answer the following research question: *What aspects relate to the perceived learning of students who entered undergraduate programs in the business field during emergency remote education?*

Therefore, in this study, we sought to analyze the positive and negative aspects concerning the perceived learning of students who remotely entered programs in the business field of a public HEI in Rio Grande do Sul. This institution resumed classes remotely - synchronous and asynchronous - indefinitely after a considerable suspension of face-to-face activities. Thus, we decided to investigate students who entered the university during ERE, that is, who did not migrate during the semester from face-to-face to remote, to identify factors related to their learning through online pedagogical alternatives incorporated into academic daily life (Ribeiro & Corrêa, 2021).

Professors were required to put aside traditional education and adopt more active and attractive teaching methods due to the sudden transition from face-to-face classes to remote lessons in Brazilian HEIs, given the change in the scenario and the emergence of new possibilities (Nogueira et al., 2020). Additionally, the possibility of face-to-face undergraduate programs offering up to 40% of the distance course workload through ICTs and virtual learning environments (VLE), established by Ordinance nº 2,117/2019 of the Ministry of Education, raises the need to understand factors related to remote learning. It is necessary to adopt teaching methods that use didactic materials and resources aimed at the inclusion of technology to meet the provisions of the ordinance above (Ordinance nº 2,117, 2019).

Identifying the impacts of changes in teaching provides opportunities for HEIs to diagnose issues and improve the positive factors of the remote modality, especially those related to the teaching-learning process (Lassoued et al., 2020). Therefore, investigating factors that interfere positively and negatively with their learning from the students' perspective can contribute to future discussions on the subject, allowing the promotion of strategies for improving business programs, aiming at education quality even in the face of existing adversities (Pavione et al., 2016; Soares et al., 2021).

The present research is structured in five sections. In addition to the introduction, this study presented a theoretical framework that contextualizes learning in ERE and the potentialities and weaknesses of this teaching modality in Section 2. The methodological procedures used to research and analyze the collected data are presented in Section 3. Section 4 shows the results, and in the last section, we present the research conclusions.

2 THEORETICAL FRAMEWORK

This section presents the theoretical framework used for constructing the research, in which the focus is learning in ERE and the potentialities and weaknesses of this teaching modality.

2.1 Learning in Emergency Remote Education

According to Anastasiou (2015), learning is related to the appropriation of knowledge by the student. In this conception, learning is understood as a continuous process of knowledge acquisition (Gil, 2020). Therefore, learning consists of a daily construction through the students' experiences (Freire, 1996).

Learning results from the teaching-learning process characterized as a complex interaction between the institution, the professor, the student, and the subject, and depends on various actions

carried out inside and outside the classroom (Anastasiou, 2015; Pavione et al., 2016). Beck and Rausch (2014) identified that the excess of lectures negatively interferes with learning from the students' perception and the professor's lack of knowledge and preparation to teach the content addressed in the discipline. In addition, the lack of student motivation stood out as a learning limiter (Beck & Rausch, 2014).

According to Pavione et al. (2016), the interaction between professors and students is also a relevant factor for learning. It can present a negative impact if it does not exist or is reduced. These findings highlight the importance of adequate class planning, including the definition of teaching strategies to be used throughout the semester or school year and professor training (Mazzioni, 2013). Gil (2020) claims that there must be interest by the student in the learning activities proposed by the professor for learning to occur in a meaningful way. The student must have an active posture. The professors must use active teaching approaches (Gil, 2020).

The teaching-learning process in universities suddenly underwent several changes due to the COVID-19 pandemic, requiring a total reformulation and rethinking. How the professors conduct their classes and interact with the students changed completely (Nogueira et al., 2020). All changes have occurred since the adoption of ERE. This teaching modality emerged as a temporary alternative to continue the school year interrupted by the suspension of face-to-face activities due to the social distancing measures adopted to prevent the spread of the COVID-19 pandemic (Ministério da Educação, 2020; Conselho Nacional de Educação, 2020).

ERE consists of synchronous and asynchronous activities that can be carried out anywhere, making the teaching-learning process more flexible (Conselho Nacional de Educação, 2020; Hodges et al., 2020). However, ERE is a provisional solution until face-to-face education can return since, in its adoption, the methodologies and pedagogical practices used only migrated to the digital environment without the proper planning or preparation required to achieve quality education (Hodges et al., 2020; Moreira et al., 2020). Thus, Coqueiro e Sousa (2021) indicate that, despite the various pedagogical practices and alternatives that can be developed in ERE, specific attention is necessary since the lack of planning in its adoption and operationalization entails negative consequences that go beyond the difficulty of access to digital tools.

In turn, traditional teaching methods are predominant in face-to-face education. Mazzioni (2013) indicated that, from the perspective of Accounting students, the teaching strategy most adopted by professors is the lectures using the board and overhead projector. In the study by Marques e Biavatti (2019), the lectures were also predominant in accounting teaching. Lectures lead students to assume a supporting role in their learning (Nasu, 2019). Therefore, professors must rethink their teaching strategies, especially lectures, and diversify them (Marques & Biavatti, 2019).

On the other hand, the space for remote education is reduced since it requires technological tools and didactic resources that make the class attractive and interesting and allow active student participation (Nogueira et al., 2020). ICTs in education enable interactive learning, fostering student motivation and enthusiasm to learn and positively reflecting academic performance (Quintana & Afonso, 2018). In this sense, technical and structural aspects related to the lack of access to the Internet and the study environment can hinder the use of ICTs in remote classes, as pointed out by Sangster et al. (2020).

In ERE, teaching strategies not previously used or adopted in a complementary way in the face-to-face teaching-learning process became predominant (Nogueira et al., 2020). Silva et al. (2020) found an increase in the frequency of forum, video, and *lives* use made available on *YouTube* and Podcasts. In contrast, the students investigated reported a reduction in the use of *slides* by the professors (Silva et al., 2020). Based on the above, it is observed that the pedagogical aspects related to the professors and their teaching practice are relevant in the remote teaching-learning process. Students should develop technical and professional skills in the program, reinforcing the need to qualify professors who work in business courses (Lima, 2023).

Learning in ERE through ICTs requires the involvement of the student and professor to be effective (Quintana & Afonso, 2018). The professor mediates the teaching-learning process, guiding the student in constructing knowledge. The students, in turn, must assume the center of their learning, fostering their autonomy and not restricting themselves to the materials made available by the professor (Lima, 2023; Nogueira et al., 2020). In other words, there must be an interaction between the actors involved to succeed in the teaching-learning process (Mazzioni, 2013).

2.2 Potentials and Weaknesses of Emergency Remote Education

Regarding the adoption of ERE and how this teaching modality has been used, Sangster et al. (2020) warn of the reflexes in the teaching-learning process, mainly because the actors involved were not prepared for sudden changes brought by this teaching modality or the efficient use of ICTs (Gusso et al., 2020). Along with adapting to the new reality faced, students and professors faced the obstacles presented by remote education, such as inadequate study environment, issues related to the internet, emotional and personal issues, accumulation of activities for delivery, and lack of interaction in the classroom, among others (Lassoued et al., 2020; Sangster et al., 2020).

Every change generates some impact and brings negative and positive consequences. Therefore, the scenario experienced since March 2020, in which chalk and blackboard were replaced by synchronous classes, *chats*, forums, and video classes (Nogueira et al., 2020), has encouraged researchers worldwide to seek to identify and understand limiting and facilitating factors of learning during the challenging ERE (Agnez, 2021; Baczek et al., 2021; Flores et al., 2021; Lassoued et al., 2020).

As for the negative impacts on learning during ERE, students investigated by Baczek et al. (2021) indicated that reduced interaction with the professor and lack of self-discipline impaired their learning. Also, students rated themselves as less active during remote classes than in face-to-face classes (Baczek et al., 2021). In the same perspective, Flores et al. (2021) stressed that difficulties in concentration, time and requested tasks/work management, and the difficulty in maintaining the study routine hinder remote learning (Soares et al., 2021).

Problems related to internet infrastructure (lack of connectivity, data limit, and transmission speed) have been reported in the studies of Dosea et al. (2020), Sangster et al. (2020), and Muthuprasad et al. (2021), and the deficiency in poor audio and image quality (Baczek et al., 2021). This situation can be harmful to students since satisfactory access to technological resources is fundamental for the effectiveness of the teaching experienced during ERE (Nogueira et al., 2020).

The lack of an adequate home environment to study remotely and the teaching platform used have also been reported as a learning hindrance (Dosea et al., 2020). In addition, Soares et al. (2021) consider teaching practices as aspects that hinder student learning during ERE, especially from professors who use traditional teaching methods to teach their classes.

Agnez (2021) highlighted the possibility of recording synchronous classes as an advantage of ERE, which can positively impact student learning. Likewise, Silveira et al. (2021) state that using video classes is considered a positive factor for the learning of the investigated students. In this sense, both the recording of live classes and the availability of video classes allow students to learn at their own pace since the content can be consulted at any time and reviewed as many times as necessary (Baczek et al., 2021; Silveira et al., 2021).

Another positive aspect that must be exposed concerns the flexibility in study schedules, which is related to the availability of recorded classes since it allows watching from anywhere (Silva et al., 2020). Thus, students who work and, perhaps, could not participate in a class do not lose the content addressed. Consequently, there is no reduction in learning (Silveira et al., 2021). Flexibility in the deadlines for delivering activities can also help learning (Soares et al., 2021).

Lago et al. (2021) reported that group work dynamics contribute positively to learning during remote classes, demonstrating the need for a constant search for deepening content in other sources; that is, in addition to the material provided by the professor, allowing students to seek knowledge autonomously and enhance learning, especially those who prefer to study alone (Muthuprasad et al., 2021; Rocha & Figueiredo, 2021; Silveira et al., 2021).

The above demonstrates that while ERE is fraught with obstacles that make it less effective in learning, it can also be advantageous (Lassoued et al., 2020). Recent research indicates that, from the students' perspective, despite the limitations, there was learning (Agnez, 2021; Dosea et al., 2020). However, Silva et al. (2020) indicate insufficient utilization throughout ERE. Therefore, the aspects related to this teaching modality can favor or harm student learning (Flores et al., 2021).

3 METHODOLOGICAL PROCEDURES

This descriptive study was developed using a quantitative approach through a survey using a questionnaire (Martins & Theóphilo, 2016) sent online to 316 students who entered remotely in the first semester of 2021 in the Administration, Accounting, and Economic Sciences programs offered by a public HEI in Rio Grande do Sul. The choice of population arose from the intention to investigate the initial experiences of these students in ERE since they did not migrate from the classroom to remote education; that is, they entered the chosen program without having experienced face-to-face classes. Those who began the program in 2020, despite having experienced remote experiences, performed part of the semester face-to-face and, thus, were not included in the research.

The questionnaire was composed of four parts, structured on the *Google Forms*® platform, and the *link* was sent to the email addresses of students who made up the study population. Data collection occurred at the end of the first semester (September 2021), when five electronic messages were sent throughout the month. In the first part of the data collection instrument, the students were presented with the acceptance form for participation in the research. Refusal would refer the students to the acknowledgments page.

The second part was devoted to questions to identify student characteristics, their conditions for studying remotely, and preferences resulting from the initial experience in ERE. The questions were developed based on the authors' perception of the research and previous studies (Muthuprasad et al., 2021; Silva et al., 2020). This part of the questionnaire also addressed the student's perceived learning throughout the semester, evaluated through an ordinal continuous variable of four points ranging from 0 to 3 (0 – insufficient; 1 – sufficient; 2 – good; and 3 – very good).

We chose to use this type of scale to measure the student's perception of their learning. Thus, the student signals how they evaluate learning considering the scale points that cover all levels – from the lowest (insufficient) to the highest (very good). However, it is essential to emphasize that the absence of a neutral point on the scale can produce biases in the answers, given that data collection instruments with insufficient categories can lead respondents who don't have a firm opinion about the question to choose an answer that does not match their beliefs (Choi & Pak, 2005). Therefore, a five-point scale minimizes response biases (Choi & Pak, 2005). Thus, the format of the scale used in the study and the insufficient categories are presented as methodological limitations of the research, which should be observed in future studies to obtain more accurate data about perceived learning. However, it does not invalidate the results obtained in the present study since the scale allows the respondent to search for the answer that most closely matches their perception.

The use of students' perceived learning instead of the grade averages in the semester was because, for some authors, it may not be the best form to evaluate learning (Almeida & Coimbra, 2018; Araújo et al., 2013). In addition, the changes and novelties imposed by ERE hindered the

evaluation process and brought a series of doubts regarding the methods used and their effectiveness in measuring student learning (Nogueira et al., 2020; Silva et al., 2020).

The third and fourth parts (Table 1) consisted of ten and eight items, respectively, comprising positive and negative aspects of learning in remote education, elaborated by the study's authors based on the previous literature. Based on the cited literature, the positive items were characterized as pedagogical and personal to understand the investigated aspects better. On the other hand, the negative items refer to pedagogical, technical/structural, and personal attributes.

Table 1

Items on the positive and negative aspects regarding perceived learning

	Positive Aspects	Base literature
Pedagogical	1. Teaching methods used for online learning. 4. Flexibility in study schedules. 5. Video lessons and recording of online classes (synchronous). 6. Possibility to consult the content at any time. 7. Opportunity to seek knowledge autonomously (to deepen the content in sources other than those made available by professors).	Agnez (2021) Baczec et al. (2021) Rocha e Figueiredo (2021) Silveira et al. (2021)
Personal	2. Possibility of clarifying doubts through chat, avoiding that the doubt is not expressed to the professor via microphone due to shame or other feelings. 3. Possibility to plan for which content it is necessary to dedicate more or less study time. 8. Possibility to learn at your own time/pace and how you think is most appropriate.	Baczek et al. (2021) Muthuprasad et al. (2021) Rocha e Figueiredo (2021)
	Negative Aspects	**Base literature**
Pedagogical	1. Reduced or no interaction with professors. 7. Lack of preparation of professors for remote education. 8. Lack of support and/or feedback from professors on questions and exams. 10. Overload of work requested by professors.	Baczek et al. (2021) Flores et al. (2021)
Technical/structure	2. Technical issues (poor audio/video quality during lessons online classes; loss or instability of connection during online classes). 3. Lack of equipment for online learning and/or insufficient data package (mobile or broadband) for online activities. 5. The home environment is not suitable for online studying. 6. Difficulty using the technology needed for online classes and activities.	Baczek et al. (2021) Lassoued et al. (2020) Muthuprasad et al. (2021)
Personal	4. Reduced or no interaction with colleagues. 9. Difficulty concentrating/paying attention during online classes and activities.	Baczek et al. (2021) Flores et al. (2021)

Source: Prepared based on the cited literature.

The data collection instrument went through two pre-test stages. In the first stage, two professors/researchers from different HEIs working in accounting education and research altered the proposals. After adjusting the instrument, the semantic pre-test was performed with a group of students who entered the Accounting Sciences program in 2020 in the face-to-face modality and migrated to remote education after the suspension of face-to-face classes. At this stage, no changes were reported by the participants.

The *Likert* ordinal continuous scale with seven points (1-totally disagree to 7-totally agree) was used to measure the responses to the items of the third and fourth parts of the questionnaire. The respondents were asked to indicate the degree of disagreement/agreement for each affirmative, representing aspects that may have positively or negatively interfered with their learning during the semester.

Data collection resulted in 50 valid responses for the data analysis stage, representing 16% of the population. In this stage, the research variables were analyzed by univariate and bivariate statistics, using descriptive statistics, the *Kolmogorov-Smirnov* normality test, *Cronbach's* alpha coefficient, and *Spearman correlation* (Field, 2009). Descriptive statistics were performed to characterize the positive and negative aspects of learning and the *Spearman* correlation to investigate the association of these aspects with perceived learning. The collected data presented in the next section were analyzed with the support of the *Statistical Package for the Social Science* (SPSS) software, version 25.

4 RESULT ANALYSIS AND DISCUSSION

Of the 50 students that comprise the study sample, 18 are studying Administration, 17 Economic Sciences, and 15 Accounting Sciences in a public HEI in Rio Grande do Sul. Most (66%) are female, with an average age of 24 and no children (92%).

Most students (68%) had not previously completed another undergraduate program, and among those who had completed (32%), only 4% reported having been distance education. Therefore, the sample is predominantly composed of students who have no previous experience with remote education, which is consistent with Gonçalves et al. (2022), who found that most students investigated reported having no previous experience with distance education. Regarding teaching modality, 58% of the students preferred face-to-face classes based on what they experienced in the program's first semester. It should be noted that 36% would like the program to be with hybrid education. Hybrid education combines face-to-face and distance education, thus combining online and face-to-face teaching elements, enabling diverse pedagogical alternatives and enriching learning (Fogarty, 2020).

The laptop was chosen by 46% of the students as the device used to perform the activities in the digital environment. The use of cell phones was chosen by 14% of the students investigated, which deserves attention due to the need for the proposed activities to be compatible with this device, which has some operational limitations (Silva et al., 2020). The students who participated in the study performed the activities at home (94%) and considered this environment appropriate (60%).

When asked about using the internet during remote activities concomitantly with other sites, 46% of the students indicated that they could reconcile their study with social networks and other websites, having a good performance at the end of the semester. In contrast, 38% claim to have dispersed with other websites, and only 16% used only the pages related to the content covered in the classes. Regarding the preferences of how to follow the disciplines remotely, based on the experience experienced throughout the semester, the students (50%) reported that they would like the professor to address the content of the subject in synchronous classes, provide readings, individual and group activities, and use interaction forums.

Regarding learning, 44% of students believe they have learned better by reading the texts, making summaries, performing activities (synchronous and asynchronous), and attending classes (video classes and live classes). This finding reinforces that many teaching strategies in remote education should be adopted and appropriate technologies used to reach the educational objectives and meet the needs of students (Moreira et al., 2020). The involvement of the subjects – students and professors – is necessary for the teaching-learning process to be successful. This requires adopting diversified teaching strategies that lead students to appropriate knowledge (Anastasiou, 2015).

The results of the learning evaluation, measured through the learning perceived by the respondents, indicate that most respondents (44%) perceived their learning as sufficient at the end of the experience in the program's first semester and remotely.

Table 2
Perceived learning during the semester

Perceived learning	N	%
Insufficient	9	18
Sufficient	22	44
Good	14	28
Very good	5	10
∑	**50**	**100**

Source: Research data (2021).

Considering that 28% of the students consider their learning good and 10% very good, it is possible to infer that, despite the challenges students may have faced throughout the academic semester, it was possible to learn the content addressed in the disciplines taken. Almeida and Coimbra (2018) reinforce that the learning evaluation goes beyond the application of tests and papers and that self-evaluation by the student can favor the learning evaluation process.

The findings corroborate that the use of ICTs in remote education enables the involvement of students in the learning activities proposed by the professor and can contribute positively to learning and academic performance (Gaviria et al., 2015; Nasu, 2019; Quintana & Afonso, 2018). Therefore, ICTs can be adopted as facilitating tools in the teaching-learning process, allowing the student to build knowledge and not just memorize and retain the content.

The results are similar to those of Flores et al. (2021), in which 34.6% of students evaluated their learning as "good". In contrast, Silva et al. (2020) found that 46.5% of the students who participated in the study reported being dissatisfied with their learning during ERE and that they did not obtain a positive achievement in the disciplines taken (69.4%). This strengthens that ERE has advantages and disadvantages concerning learning.

After analyzing the first part of the questionnaire, we used *Cronbach's* coefficient to evaluate the questionnaire's reliability to investigate the positive and negative aspects of student learning during the remote semester. The results indicated that the negative and positive aspects have acceptable coefficients, 0.818 and 0.856, respectively (Field, 2009).

Subsequently, the items referring to each aspect investigated – pedagogical, technical/structure, and personal – were analyzed descriptively, segregating them into positive (Table 3) and negative (Table 4), as detailed in the methodological procedures section.

Table 3
Positive aspects related to perceived learning

	Aspect	Minimum	Maximum	Mean	Median	Standard Deviation
Pedagogical	Item 6	3	7	6.04	7.00	1.212
	Item 5	2	7	5.72	6.00	1.356
	Item 4	1	7	5.64	6.00	1.382
	Item 7	1	7	5.18	5.50	1.815
	Item 1	2	7	4.78	5.00	1.375
Personal	Item 8	1	7	5.34	6.00	1.869
	Item 3	1	7	5.28	5.00	1.499
	Item 2	1	7	4.88	5.00	1.837

Source: Research data (2021).

The item "possibility to consult the content at any time" (item 6), which includes the pedagogical aspect, obtained the highest mean and percentage of agreement (86%). Access to the material, especially before class, makes it possible to prepare students for face-to-face or remote meetings, making the class less monotonous and more interactive (Fogarty, 2020). Therefore, this finding emphasizes the relevance of using VLE to provide content, even with the return of face-to-face classes (Soares et al., 2021). In this sense, the adoption of teaching strategies that allow the student to interact with the content before class, such as seminars, dialogued lectures, debates, and inverted classrooms, can positively impact the learning perceived by students (Mazzioni, 2013; Schmitt et al., 2021).

Item 5, "video classes and recording of online classes (synchronous)," as a positive learning influencer (mean 5.72 and 82% agreement) reinforces the results of previous studies (Agnez, 2021; Rocha & Figueiredo, 2021; Silveira et al., 2021) and indicates that the use of ICTs in education can favor student learning, especially concerning class recording, which allows students to re-attend them and understand points that were not previously absorbed (Agnez, 2021). However, it is necessary to ensure that the student does not use the recording only to transmit information, in which learning occurs by repetition and mechanically (Gaviria et al., 2015).

Another item with a high mean is "flexibility in study schedules" (item 4), allowing us to infer that the possibility of studying when the student deems appropriate favors their learning, especially those who, for professional reasons, cannot attend all classes or even arrive late, losing part of the content being addressed (Silva et al., 2020; Silveira et al., 2021). On this, the findings of Rocha and Figueiredo (2021) indicate that remote teaching is more flexible than face-to-face education and contributes to learning.

Thus, it is understood that, whether it is provided face-to-face or remotely, education is not immune to technology and must be allied to the available technological tools to achieve educational objectives (Fogarty, 2020). The success of the teaching-learning process is in the involvement of students in the proposed learning activities. Therefore, professors must plan their classes so that students feel enthusiastic about building knowledge and developing the skills demanded by the market (Gil, 2020). Therefore, adopting ICTs favors meaningful and quality learning (Gaviria et al., 2015; Nasu, 2019; Quintana & Afonso, 2018).

Regarding the personal aspect, the "possibility of learning in their time/rhythm and how they believe is most appropriate" (item 8) stood out among the other aspects. Baczek et al. (2021) found that most students reported that learning at their own pace is an advantage of remote education adopted during the COVID-19 pandemic. Using VLE in ERE as a repository of materials and digital learning platform made planning and managing learning possible, facilitating study (Rocha e Figueiredo, 2021).

Table 4
Negative aspects related to perceived learning

Aspect		Minimum	Maximum	Mean	Median	Standard Deviation
Pedagogical	Item 10	2	7	4.94	5.00	1.659
	Item 1	1	7	4.80	5.00	2.213
	Item 7	1	7	3.16	3.00	1.833
	Item 8	1	7	3.30	3.50	1.919
Technical/structure	Item 5	1	7	4.44	4.00	2.111
	Item 2	1	7	4.40	5.00	2.020
	Item 3	1	7	2.96	2.00	2.166
	Item 6	1	7	2.72	2.00	2.011
Personal	Item 9	1	7	5.00	5.50	2.000
	Item 4	2	7	4.24	4.00	2.066

Source: Research data (2021).

Among the ten items regarding aspects with negative influence on the learning perceived by students, "difficulty of concentration/attention during online classes and activities"(item 9), related to the personal aspect, obtained the highest mean and median (5.00 and 5.50, respectively). This finding is consistent with Silva et al. (2020) and Flores et al. (2021), indicating that the digital environment is conducive to distractions and that the discomfort of attending classes in front of a computer or cell phone for an extended period requires varied and attractive teaching methods (Dosea et al., 2020; Nogueira et al., 2020).

The "overload of work requested by professors" (item 10), which includes the pedagogical aspect, was also highlighted and corroborated that students were in high demand for activities during ERE (Flores et al., 2021). This brings to light the need for reflection by professors concerning the forms of evaluation and an awareness of the human issue that the pandemic requires (Rocha, 2020). The professor must organize and conduct the discipline according to the class profile, observing the students' learning conditions, their difficulties with the content, and their limitations. The professors must also reflect on students who work full time and their academic demands since excess activities can negatively affect learning (Nogueira et al., 2020).

Another item with a high average was "reduced or non-existent interaction with professors" (item 1), indicating that the interaction between students and professors in the classroom is a pedagogical aspect that influences learning. This finding is supported by Baczek et al. (2021), Flores et al. (2021), and Lassoued et al. (2020). It corroborates that the remote classroom is a dynamic space that should allow active and participatory learning (Moreira et al., 2020). It is worth mentioning that before ERE, the lack of interaction between students and professors was already indicated as a factor that negatively influenced learning during face-to-face education (Pavione et al., 2016). However, this issue was intensified with synchronous classes (Nogueira et al., 2020), as evidenced by Flores et al. (2021), who found that only 13% of students reported interacting more with professors in remote education compared to face-to-face teaching.

Regarding the technical aspect/structure, item 5, "the home environment is not suitable for online studying" stood out, indicating the need for a quiet place for learning at home (Baczek et al., 2021). Sangster et al. (2020) state that many students could not attend synchronous classes because they did not have an appropriate place, negatively impacting the teaching-learning process.

In addition, the respondents' self-report indicates that "technical issues (poor audio/video quality during online classes; loss or instability of connection during online classes)" (item 2) negatively influence learning. The authors also emphasize that, from the students' perspective, learning and good academic performance depend on access to a quality internet, both by students and professors (Soares et al., 2021).

The statistical tool *Spearman* correlation was used to understand the significance of the positive and negative aspects related to learning during ERE. This choice was promoted due to the use of ordinal variables, the sample size, and the results found from the *Kolmogorov-Smirnov* normality test. The test indicated acceptance of the null hypothesis (*p-value* < 0.05); that is, the data are not normally distributed. In view of the above, we chose a nonparametric correlation (Field, 2009), as presented in Tables 5 and 6.

Table 5

Correlation between positive aspects and perceived learning

	Perceived learning	
	Correlation coefficient	***p-value***
Item 1	0.334*	0.018
Item 2	0.070	0.631
Item 3	0.204	0.155
Item 4	0.125	0.385
Item 5	0.143	0.321
Item 6	0.183	0.204
Item 7	0.355*	0.011
Item 8	0.252	0.077

Note. *significance at the level of 5%.
Source: Research data (2021).

The results obtained from the correlations (Table 5) indicate that only the "teaching methods used for online learning" and the "opportunity to seek knowledge autonomously (deepen content in sources other than those made available by professors)" correlate statistically significantly with perceived learning (*p-value* < 0.05). The positive correlations allow us to infer that the teaching strategies adopted by professors throughout the semester and the adoption of an active and autonomous posture by the student are positively related to perceived learning, demonstrating that pedagogical aspects can influence student learning.

The way the professors conduct their classes helps the students in appropriating and constructing knowledge; adopting diversified teaching strategies allows the students to engage in the teaching-learning process (Anastasiou, 2015). In this regard, the findings of Ribeiro and Corrêa (2021) reveal that students relate their learning during ERE with the diversity of teaching methods used by professors in remote classes.

Table 6

Correlation between negative aspects and perceived learning

	Perceived learning	
	Correlation coefficient	***p-value***
Item 1	-0.302*	0.033
Item 2	-0.250	0.080
Item 3	-0.061	0.673
Item 4	-0.164	0.254
Item 5	-0.357*	0.011
Item 6	-0.143	0.322
Item 7	-0.284*	0.046
Item 8	-0.002	0.989
Item 9	-0.288*	0.043
Item 10	-0.082	0.571

Note. *significance at the level of 5%.
Source: Research data (2021).

The results of the correlations reveal that the negative aspects are associated in a statistically significant way (*p-value* < 0.05) with perceived learning item 1 (pedagogical aspect), item 5 (technical aspect/structure), item 7 (pedagogical aspect), and item 9 (personal aspect). Therefore, the test's null hypothesis, that there is no association between analyzed variables, was refuted for these variables.

The results also indicate that the correlations found are negative, demonstrating that reduced or non-existent interaction with professors", "the home environment is not suitable for online studying", "lack of preparation of professors for remote education", and "difficulty of concentration/attention during online classes and activities" relate negatively to perceived

learning. These aspects highlight the weaknesses of ERE, which negatively influence the teaching-learning process. The remote classroom should be rich in pedagogical possibilities and diverse methodologies. However, HEIs must regularly evaluate the positive and negative aspects of ERE and student academic performance (Gonçalves et al., 2022; Moreira et al., 2020).

The correlation results show that the pedagogical aspect is positively and negatively related to the learning perceived by students throughout the semester. These findings show that, from the student's perspective, issues concerning the professors and their teaching practice influence learning. This result corroborates those of Schmitt et al. (2021), in which professors who reported having diversified the teaching methods used in the ERE, mainly focused on active methodologies, understand that this led to reaching the teaching-learning objectives.

5 CONCLUSIONS

In this study, we sought to analyze the positive and negative aspects concerning the perceived learning of students who remotely entered programs in the business field of a public HEI in Rio Grande do Sul. The results demonstrate that aspects characterized as pedagogical were positively and negatively related to the learning of the 50 students who participated in the study by the end of the initial experience with ERE.

As the main findings regarding the influencing aspects of learning, the teaching methods used by professors and the reduced or non-existent interaction with professors during remote learning demonstrate that factors beyond the availability of electronic devices and internet access are necessary for remote learning to occur satisfactorily. This occurs because the results indicate that learning in the ERE is linked to aspects directly related to the professor, whether they are negative or positive to perceived learning. The classroom is where the student has more contact and support from the professor in the remote and face-to-face modalities (Rocha, 2020). This should be a dynamic and creative environment in which the learning process is allied with technological tools that encourage autonomy.

Regarding using ICTs in the teaching-learning process, professors, managers, and students must reflect on why they should be adopted. Previous research indicates that students were passive about their learning before ERE. Thus, it is necessary to ensure that these resources are not used to keep the students in their comfort zone, acting only as a receiver of information in which knowledge is transmitted and not constructed (Gaviria et al., 2015).

Globalization and changes in the market cause new requirements arise in management and business professions, demanding that education be improved. By exploring the ERE and presenting a panorama of the scenario surrounding the teaching-learning process in a period of so many changes and transformations, it is possible to advance the understanding of aspects related to the learning of students of business programs, especially concerning the pedagogical aspect focused on the professors and their teaching strategies.

Thus, the study reinforces the importance of student support and preparation for remote education, the need for continuing education for professors, and the need to rethink the teaching practices used after ERE, incorporating technological resources into post-crisis education. COVID-19 has shown that it is necessary to consider teaching strategies and practices for non-traditional education (Sangster et al., 2020) since the transforming scenario of teaching and learning, focused on the adoption of technologies in education, indicates that HEIs must prepare professors and students for hybrid education, which consists of a combined approach of face-to-face and distance education.

Using digital pedagogical elements in face-to-face classes enables diverse learning in which students and professors walk together to reach educational objectives, making the classes more dynamic and interactive and fostering curiosity and autonomy. However, the successful adoption of remote education in the pedagogical project of face-to-face programs requires planning

and understanding of the positive and negative factors of this approach. This theme should be the agenda of pedagogical and institutional meetings since managers and professors must discuss the changes in higher education, many evidenced after ERE. Additionally, it is necessary to listen to students, establishing an open channel of communication where their aspirations, limitations, and goals are considered in the development of pedagogical and institutional actions.

Also, it is well known that business programs require digital tools that provide a link between theory and practice. Finance, Marketing, Logistics, Controllership, and Management, among other departments, are daily affected by digital transformation, in which business and technology are allies and require technical skills, professional skills, and attitudes, which students in their academic training must develop. Educational institutions must be prepared for crises, even in smaller proportions than those caused by COVID-19.

Finally, this study presents two methodological limitations. It is understood that the scale used to measure perceived learning using few categories may have produced response bias. In this way, similar research should consider this aspect. Another limitation refers to the sample size. It is important to emphasize that, despite all the challenges faced during social distancing and ERE, research in education has advanced and was fruitful regarding investigations and discoveries, so the number of requests for participation in scientific research that students received may have contributed to the low number of respondents. However, the research objective was achieved even with this limitation. Future research should deepen the understanding of the subject and focus on perceived learning, testing the investigated aspects and others that are not covered in the present study through different methodological approaches.

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