

The teaching of the disciplines of financial mathematics and institution of public and private law during and after the pandemic in the course of accounting FEAC- UFAL



<https://doi.org/10.56238/ptoketheeducati-082>

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ABSTRACT

On March 11, more than 128 countries identified the presence of the virus (Covid-19) as a pandemic, due to the severity of the disease and the exponential geographical contamination. As it spread, the threat of an economic recession materialized, where educators had to focus on the task of teaching remotely. Highlight the impacts of COVID-19 in the disciplines of Financial Mathematics and Institution

of Public and Private Law of the Accounting course, FEAC – UFAL. The methodology adopted was through material already published, such as books, articles, periodicals, Internet, etc. This topic can help in pondering some aspects: During and after the pandemic were their dropouts in the school semester? What is the prospect of adopting active technology in case the crisis is repeated? How to promote the reception of the student of the face-to-face graduation of FEAC by virtuality? In view of the above, as a conclusion, it is observed that the data raise a special attention in the educational context for hybrid education. There is still resistance to the use of digital technologies in the classroom. However, it is necessary to always be willing to learn whether in the technological, interdisciplinary, social-emotional, scientific sphere, based on the dialogue between professor, student, and higher management of a Higher Education Institution.

Keywords: Information and Communication Technology (ICT), Covid-19, Evasion, Web Conferencing.

1 INTRODUCTION

1.1 CONTEXTUALIZATION OF THE THEME

At the end of December 2019, the World Health Organization (WHO) was warned about high cases of pneumonia in the city of Wuhan of China. At the time investigated a type of coronavirus that had not been recognized before in humans.

On January 7, 2020, Chinese authorities proved that they had pointed to a new type of coronavirus. Subsequently, on January 30, the WHO declared that the outbreak of this virus (Covid-19) constituted a public health emergency of international importance.

On February 6, Law No. 13979 was enacted to address the public health emergency, which aims to "protect the community."

Immediately, on March 11, more than 180 countries identified the presence of the virus as a pandemic, due to the severity of the disease and the exponential geographical contamination.



The Crescent In advance of disease contamination, several government authorities have been adopting various strategies, with the intention of reducing the pace of disease progression (Kraemer et al., 2020).

Given the addressed, COVID-19 is transmitted from being to being, by sneezing, coughing, accompanied by any and all minimal contact through the mouth, nose or eyes, as well as through contaminated objects and surfaces (WHO, 2020b).

The first measure adopted, among the strategies it was social distancing, avoiding crowds in order to maintain at least six feet of distance between people.

Events were also banned, despite some relaxations according to the color range classified due to the high number of people infected. (Kings-Son & Fifth, 2020).

Oliveira (2020) highlights on the recommendation that people suspected of having the virus, remain in quarantine for fourteen days, as this is the incubation period of SARS-CoV-2, that is, the time for the virus to manifest itself in the individual's body.

Thus, several impacts in the scope of the economy and social relations were presented, as well as uncertainties and implications in various spheres, among them, in the scope of the education.

In view of what was addressed, initially there was a suspension, **of classes, for an indefinite period of face-to-face activities**, by order of the Ministry of Education, as an attempt to reduce the risk of contagion and spread of the coronavirus.

The use of web conferencing as a tool in distance education is not new, however, it is necessary to have more discussion on the subject, in the classroom, regarding the access regimes of both the student and the hiring of the teacher.

Ujvari (2011) draws attention to the fact that it is no longer possible to understand epidemics without covering the speed of population displacements, which must be taken into account in the speed of the control measures implemented, that is, due to transmissible diseases.

Leaving this reality of isolation more latent by emphasizing the spread by the geographical mobility of epidemics through infected individuals: epidemics, local, become pandemics, generalized geographically without containment measures.

Maia and Matar (2009) state that student and teacher interaction is only positive when there is complicity.

Thus, for web conferencing to be more effective, it is necessary to develop "strategies and skills to keep the focus on the discussion and stimulate the participation of all" (DOTTA et al, 2013)

Gomes et al (2013) states "the best classes are those that have movement, action, that know how to break the monotony". In this sense, it is important to evaluate the class, a step that can be done later.



Given the context addressed, the delimitation of the research takes place through the guiding question, that is, this theme can help in the weighting of some aspects:

During and after the pandemic, were there dropouts in the academic semester related to the disciplines of Financial Mathematics and Institution of Public and Private Law (IDPP) for the accounting course? What is the prospect of adopting active technology in case the crisis is repeated?

1.2 GOALS

To better delimit the theme for a better understanding, it is necessary to define the general and specific objectives of this research.

1.2.1 General Objective

Highlight the impacts of COVID-19 in the disciplines of Financial Mathematics and Institution of Public and Private Law of the Accounting course, FEAC – UFAL.

1.2.2 Specific Objectives

- Motivate the participation of students in virtual learning environments.
- Stimulate communication tools in the disciplines of calculus and law.
- Assess Learning in times of quarantine.

1.3 JUSTIFICATION

Remote learning **disseminates the real-time communication of classes through technologies**. The idea is that the teacher and students of a given discipline have interactions, at the same times that the classes would take place in the face-to-face model.

Thus, the teaching method applied in the pandemic resembles distance education only in terms of a construction of knowledge mediated by technology, but it is differentiated by virtue of following the principles used in face-to-face education.

The justification of this research is given by the fact that online classes, associated with a hybrid model may be a new strategy (in the medium and long term) in the teaching of the face-to-face modality, enabling a new method of virtuality in the current educational scenario.

Faced with these questions: How to promote the reception of the student of the face-to-face graduation of FEAC by virtuality?

Thus, the research reveals its relevance not only by contributing with the pertinent knowledge on the theme of active methodologies, but also by aggregating reports of the students' experience.



2 THEORETICAL CONSIDERATIONS

2.1 TEACHING LEARNING

According to Rosário et al. (2008, p.116), the term self-regulation of learning gained its peak in the 80s of the twentieth century, emphasizing the emerging autonomy and responsibility of students in the conduct of their studies. According to this author, self-regulation can be defined as an "active process in which subjects establish the objectives that guide their learning by trying to monitor, regulate and control their cognitions, motivation and behaviors in order to achieve them" (Rosário, 2005, p.37).

There are several ways to develop the teaching and learning activity. There are cases where this action is in a group, to have a great interaction between the participants, thus addressing the main themes in order to meet all students.

However, as there are different forms of learning, according to Perrenoud (2016) all students have the right to have an individual teaching, if it is noticed that the form of learning used by the teacher is not reaching its objectives with any student.

The student, when reviewing the content to teach, thus improving their own knowledge by receiving guidance from the teacher of the discipline and therefore, allows students to enjoy the possibility of resolving conceptual doubts and solving exercises, as well as direct contact with someone who understands it more directly (Molero & Fernández, 1995).

According to Molero and Fernández (1995), learning among students is constituted in an education system in which the partners teach and learn each other, that is, one student teaches the other with a work proposal in which everyone participates by discussing and reflecting together on certain content.

Duran and Vidal (2007) highlight that there needs to be an investment in prior qualification for students, offering clarifications if necessary for the good performance of such function; organize systematic supervision by the professors and advisors, especially in activities related to teaching; thus providing opportunities for reflections on the change of conception with practice.

However, care must be taken not to believe that this is an easy teaching modality, because it consists of a practice that requires monitoring by the teacher, care in the training of students, and commitment of the Educational Institution to do a quality work.

With the evolution of technology, virtual learning environments are gaining more and more spaces, as well as social networks, no longer only an entertainment channel but also a space used for learning.

In this sense, Ira Maciel (2008) highlights the possibility that virtual learning environments should contribute to extinguish distance learning, highlighting some items: organization of the environment; interfaces that are easy for students to handle; attractive environment; resource offerings for individual and group learning; access to bibliographic sources; interactive communication



(asynchronous and synchronous); existence of space for personal presentations, distinct options of evaluative actions; enable conditions for the responsible person to monitor and evaluate the student.

The interaction, the language of the material adopted, it is also necessary to remember the autonomy that the student must have for a better construction, motivate him to the responsibility in the teaching-learning process, leading it, organizing it, cites Struchiner (2008).

Thus, in the constructivist environment, the learner must be the producer of knowledge, monitoring together with the teacher his learning process, substantiating each answer, forgetting the traditional method of what is right or wrong.

Fernandes (2011) warns that in the virtual learning environment teaching is based on the socio-constructivist conception in which the student is seen as a builder of knowledge.

Rodrigues et al (2020) cite that with advances in technology, the student can be closer to each other through the application "WhatsApp" thus generating better results for the classes. Another fact that deserves to be highlighted is that in the first week of class, although distant, this technology made most students feel safe and their planning of activities, was being created together with the teacher guiding the discipline.

2.2 EDUCATIONAL POLICIES IN THE PANDEMIC

VITORINO and HOLLNAGEL (2020) highlight that: "in March 2019, the covid-19 pandemic was made official in Brazil, accompanied by decrees (created by federal, state and municipal agencies), which regulated conducts to be followed as a contingency plan to restrict the contagion of the disease."

The alternative adopted was to leverage remote teaching for educational institutions.

CARVALHO and ARAÚJO (2020) state that, in the same way that the remote as an alternative "enabled" access to classes, a marked fragility was highlighted in the classes referring: to the teaching and learning process that caused a very high school dropout.

In Brazil, several educational policies were created that reflected the characteristics of our legal system in which gradually, public and private institutions of Higher Education were assuming several protocols of suspension of classes, initially, in favor of social isolation, correlated with the political-administrative decisions of each Brazilian state.

Of the protocols created several studies are related:

- Theme addressed by the Organization for Economic Cooperation and Development (OECD), of the authors, Reimers and Schleicher (2020), who suggest groups for the construction of standards and indexes to be able to understand the national and global responses related, mainly, to Education, as well as to think about monitoring and future investigations.



The authors highlight the new legal and administrative concepts to support political actions in education in relation to the regulation of remote work for the implementation of Emergency Remote Teaching (ERE).

REIMERS and SCHLEICHER (2020) cite about the importance of didactic-pedagogical issues, of how the curriculum will be adapted. In this way there is a concern of how the classes will be built in the remote model and adapted in the period of isolation.

Universities have also been forced to rethink their activities. It was no different at UFAL (Federal University of Alagoas), where a deficit of one semester due to the necessary adjustments, suspending classes, in a first phase.

In the second moment there was a study and, in this way, an exceptional academic period was created.

Thus, HODGES et al. (2020) highlight that the multiple activities and Face-to-Face Education, saw the demand for the use and support of Non-Face-to-Face Education increase in a way for which they were not prepared.

The institutions that responded quickly, in a massive way, theoretical methodological practices of remote teaching, at the undergraduate levels were the Private Institutions.

As for the reality that existed before the pandemic, table 1 depicts the estimates of people in higher education.

How many would be, in 2018, unable to follow remote teaching-learning activities because they do not have home access to the internet with minimum quality to access.



Table 1 – Profile of undergraduate students without home access to broadband or 3G/4G internet – Brazil 2018, by color/race, type of institution, location of the student's home and income

Frequentavam uma graduação	Mulheres negras ou indígenas	Mulheres brancas ou amarelas	Homens negros ou indígenas	Homens brancos ou amarelos	TOTAL
Por tipo de IES					
Públicas	543.518	518.762	507.100	479.801	2.049.181
Sem internet em casa	21.776	11.911	20.520	5.960	60.167
Privadas	1.623.700	1.750.394	1.179.541	1.285.216	5.838.851
Sem internet em casa	41.330	21.965	19.025	12.560	94.880
Por região de localização do domicílio					
Norte	296.425	102.371	232.356	68.540	699.692
Sem internet em casa	13.109	2.421	8.675	1.321	25.526
Nordeste	717.213	317.981	545.132	256.472	1.836.798
Sem internet em casa	31.343	10.321	20.189	7.018	68.871
Sudeste	777.571	1.102.920	621.500	860.667	3.362.658
Sem internet em casa	10.230	10.602	6.674	3.625	31.131
Sul	134.347	581.693	107.684	447.750	1.271.474
Sem internet em casa	3.558	7.378	761	5.304	17.001
Centro-Oeste	241.661	164.191	179.970	131.589	717.411
Sem internet em casa	4.867	3.153	3.245	1.252	12.517
Por situação do domicílio (urbana ou rural)					
Urbana	2.042.489	2.172.412	1.610.166	1.700.711	7.525.778
Sem internet em casa	40.840	26.031	22.688	14.790	104.349
Rural	124.729	96.744	76.475	64.307	362.255
Sem internet em casa	22.267	7.844	16.856	3.730	50.697
Por faixa de rendimento domiciliar per capita					
Baixa renda (até 1,5 SM)	1.490.957	1.111.100	973.760	702.596	4.278.413
Sem internet em casa	58.081	23.028	35.258	10.550	126.917

SM: salários mínimos

Source: Castioni et al (2021)

Nascimento et al. (2020) reveal that the solution, through the availability of chips, would solve the problem for more than 60% of undergraduate students without home access to the internet.

Many, however, would still need places with availability of internet signal, because in their homes does not even reach cellular mobile network signal.

Castioni et al (2021) highlighted that for students, the register that each federal university maintains of its beneficiaries of the National Student Assistance Program (Pnaes).

In this sense, the resources programmed for the PNAES (R\$ 1.038 billion in the General Budget of the Union for 2020), according to Siga Brasil, (BRASIL, 2020b) can be used for digital inclusion, according to § 1 of article 3 of Decree No. 7,234/2010, which provides for the Program.

In July 2020, four months after the outbreak of the pandemic, MEC announced an emergency contract, through the National Education and Research Network (RNP), of a mobile data package for students in a condition of socioeconomic vulnerability (RNP, 2020).



3 METHODOLOGY

3.1 TYPE OF RESEARCH REGARDING PROCEDURES

This research is a study characterized as an Integrative Literature Review (RIL), which according to Silva et al, (2020) enables the identification, synthesis and execution of a broad analysis in the literature about a specific theme.

3.2 BIBLIOGRAPHIC RESEARCH

It will be elaborated through material already published, such as books, articles, periodicals, Internet, etc. You can say that this category of research is a type of bibliographic review, or bibliographic survey.

In this sense, Gil (2007, p. 44) explains that the most characteristic examples of this type of research are investigations on ideologies or those that propose to analyze the various positions on a problem.

3.3 FIELD RESEARCH

Also considered field research because it will be carried out an analysis of student dropout through data collection by academic pages.

The case study, for this research, is approached by numerous authors, such as Yin (2005) who defends the idea that a "case" is configured as something defined, even if it is on a more abstract plane, that is, the situation in question: the decision to conduct home studies in the face of the closure of universities due to the coronavirus pandemic.

3.4 POPULATION AND SAMPLE

The population that will be studied in this research will be the students of the undergraduate courses of Accounting of FEAC-UFAL of the disciplines of financial mathematics and IDPP.

The time space used will be composed of the year 2021 and 2022 (period of validity of the research).

This period was established to better accompany the agents involved before, during and after the pandemic.

In view of the above, the following steps will be used:

- Delimitation of the theme and construction of the guiding question of the research;
- Survey of publications in selected databases;
- Inclusion, critical analysis of findings and synthesis of literature review (Souza et al., 2010).



In order to ensure the necessary ethical care, Resolution 510, of April 7, 2016, of the National Health Council (BRASIL, 2016), which provides for ethics in research in Human and Social Sciences, was taken into account.

Or Article 1 in its Sole Paragraph, item II, states that research using publicly accessible information will not be registered nor evaluated by the CONEP system, which exempts the present investigation from such analysis.

In the face of all the above, In order to guarantee the anonymity of the participants, the names of the professors who prepared the activities presented on an electronic site in the public domain will be omitted.

4 ANALYSIS OF RESULTS

In order to motivate the participation of students in virtual learning environments, the following strategies were developed:

Discipline of Financial Mathematics and IDPP

- The professor found it somewhat difficult to motivate students in the discipline of financial mathematics, since the interaction at the time of performing the calculations was often impaired, either for technological reasons or by the student's own performance.

The students did not answer the call. The same was highlighted in the evaluations.

As a stimulus it was necessary to improve remote classes valuing the student-teacher connection. The reception of the teacher is very important, because it overcomes the absence of physical contact, and in this sense the teaching was mediated through daily situations, video resources, films with the purpose of enriching the content of financial mathematics.

- As for the PPDI, the interaction was more prominent.

Insecurity, both food and professional, loss of family members and friends and emotional fragility generated by the pandemic were strongly highlighted in the students, where many were afraid to interact, felt uncomfortable because they were isolated, due to lack of condition of electronic material, as well as lack of access to the internet. This absence was filled after the edict to provide chip to the students.

With blended learning, students have greater control over their own learning. This is because they are no longer restricted to the workload of face-to-face classes to absorb content about the disciplines.

Another specific objective was to stimulate communication tools in the disciplines of calculus and law. In this sense, the most used tools were: WhatsApp, social network, social device, videos recorded by the teacher, you tube, etc. The environment used in the virtual classroom was google meet.



UFAL promoted courses for teachers, at various levels, to use virtual environments, such as moodle.

And finally it was to assess learning in times of quarantine. (Less than 35 students) Integration is still compromised.

Table 1 – Students enrolled in the research disciplines

Enrolled	Remote	Classroom
IDPP	< 33 students enrolled	➤ 50 students enrolled
MAT FIN	< 33 students enrolled	➤ 45 students enrolled

Source: Prepared by the author

Table 1 shows that at the remote moment there was resistance on the part of the students to enter the disciplines, due to the criteria already discussed previously.

Table 2 shows the participation of students in the disciplines. It is important to highlight that in the remote environment both in IDPP and in financial mathematics, participation was minimal, and that in the classroom there is a better debate on legal issues, as well as a greater involvement in the calculations constructed.

Table 2 – Participation of students in the research disciplines

Participation	Remote	Classroom
IDPP	< 10 students	➤ 30 students
MAT FIN	< 6 students enrolled	➤ 30 students enrolled

Source: Prepared by the author

In table 3 it is highlighted that the attendance in classes, in the remote is much higher than in face-to-face teaching, this is the case, that many students accessed the class in the work environment, in public transport, etc. What can not be done in the traditional modality (face-to-face).

Table 3 – Attendance in the classes of the research disciplines

Presence	Remote	Classroom
IDPP	90%	75%
MAT FIN	90%	70%

Source: Prepared by the author

In table 4 the performance in remote teaching is higher than in face-to-face teaching. What has not necessarily been a better learning, since the control of the evaluations in the remote model is impaired.



Table 4 – Students' performance in the research disciplines

Yield	Remote	Face
IDPP	97%	93%
MAT FIN	97%	93%

Source: Prepared by the author

5 FINAL CONSIDERATIONS

Inclusion in higher education education is everyone's right, BEFORE, DURING and AFTER the pandemic. The objectives of this scientific research have all been achieved.

Thus, it was observed that remote teaching, adopted in the midst of the pandemic, due to COVID 19, has led to numerous changes for the educational scenario in Brazil.

Some topics were put on the agenda, for example: the use of technologies as allies in the classroom, the high inequalities of access to digital technologies, whether by access to the internet and/or electronic material and the valorization of the teacher, increasingly forgotten, especially in private institutions.

It is important to emphasize that, after this pandemic period, Brazilian education will never return to what it was before.

Regardless of the high inequalities present in our society, whether in Alagoas or in Brazil, remote and face-to-face teaching set precedents for a new look: a hybrid education. Wave are highlighted new formats in learning.

In the same way that teachers had to adapt to new ways of teaching, different teaching and assessment tools, weaknesses in the infrastructure, work overload, students also had to readapt to the focus of learning, new plans aimed at the organization of studies were fundamental to adapt to the new digital world experienced.

Thus, it brings a greater mastery over the subject itself, by virtue of not being stuck to the moments witnessed and being able to absorb the contents gradually.

Given all the above, the guiding questions of this research were: During and after the pandemic there was a drop out in the academic semester referring to the disciplines of Financial Mathematics and Institution of Public and Private Law (IDPP) for the accounting course? The dropout of more than 40% occurred during the pandemic and in the PLE (Exceptional Academic Period).

After the pandemic, that number was greatly reduced. What is the prospect of adopting active technology in case the crisis is prolonged? Hybrid teaching will be an alternative using up to 40% remote according to the new guidelines of the Ministry of Education, although it is still a topic of discussion at UFAL.

It is possible to adopt the best parts of the teaching models: remote, face-to-face and hybrid to achieve a single goal: to improve student learning to always ensure a quality education.



However, it is worth mentioning that students tend to learn better when books are printed, that is, print is more effective to fix the narratives. The e-book represents a deficit in the quality of learning, where screens can most often affect the assimilation of reading.

Physical contact with the book is more motivating, weight, page turning, smell, than the digital e-book. It is necessary to rethink public educational policies and ensure motivation for students by providing more appropriate and innovative materials and methodologies.

In this sense, in view of the three realities, the data raise a special attention in the educational sphere for hybrid teaching. There is still resistance to the use of digital technologies in the classroom.

However, it is necessary to always be willing for learning whether in the technological, interdisciplinary, social-emotional, scientific sphere, based on the dialogue between professor, student, and higher management of a Higher Education Institution.



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