From Face-to-Face to Virtual Mode Because of Covid-19: Impact in the Teaching-Learning Process

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Abstract

Introduction: Within the framework of the pandemic provoked by the COVID-19, every teacher took the challenge to rebrand quickly and start working differently by designing and learning evaluative activities to face this E-Learning environment in which most students and teachers all around the world have been immersed for so long. **Objective:** To establish the impact of the methodological change within the traditional and virtual classroom in academics of Universidad Nacional of Costa Rica - Campus Liberia. **Method:** A total of 85 professors of the different majors have participated in this study and under a non-probabilistic sampling. A structured and closed questionnaire containing few questions was sent by e-mail utilizing the mail institutional platform and cellphones by the common digital platform WhatsApp. **Results:** The improvement of the pedagogic practice has a closed relationship with the good access to technologies and internet connection, which has been considered a clear limitation for academics to communicate with students in an easy, better and effective way. **Discussion:** The academy needs to have the clarity in relation to the conditions that students face daily in order to study utilizing distant education spaces which in many of the cases do not have access to the technological tools and connectivity, most of that due to their bad social and economic conditions.
Keywords: teaching profession; online learning; education; learning; COVID-19.

De la presencialidad a la virtualidad ante la pandemia de la Covid-19: impacto en docentes universitarios

Resumen

Introducción: En el marco de la pandemia provocada por la COVID-19, cada docente asumió el reto de reinventarse rápidamente y empezar a trabajar de otra forma, diseñando actividades de aprendizaje y evaluativas en la presencialidad remota. **Objetivo:** establecer el impacto del cambio metodológico del proceso de enseñanza-aprendizaje, de modalidad presencial a modalidad virtual, en los académicos de la Universidad Nacional de Costa Rica - Campus Liberia. **Método:** En el estudio participaron 85 personas Docentes de las diferentes carreras del centro universitario, bajo un muestreo no probabilístico. Se empleó un cuestionario estructurado y cerrado de escasas preguntas enviado por correos electrónicos institucionales y por la vía telefónica mediante la aplicación digital WhatsApp. **Resultados:** La mejora de la mediación

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pedagógica tiene estrecha relación con el acceso a la tecnología, tanto el equipo como el acceso al internet, y esta ha sido considerada una limitante para que el personal académico pueda comunicarse de manera fluida con la población estudiantil. **Discusión:** La academia debe tener claridad sobre las condiciones de la población estudiantil, la cual no tiene las facilidades de acceso a las herramientas tecnológicas, conectividad y, especialmente, condiciones económicas, sociales y afectivas.

Palabras clave: docencia; aprendizaje en línea; educación; aprendizaje; COVID-19.

Introduction

After the World Health Organization declared on March 11, 2020 the public health emergency situation due to the infectious disease COVID-19 at the international level, many countries had already planned measures to mitigate the spread of the virus causing it, SARS-CoV-2. In Costa Rica, one of the measures imposed to deal with the coronavirus crisis was to close basic education centers (kindergartens, schools) and higher education institutions from the second half of March.

Coronavirus disease has unexpectedly and radically changed the way education is delivered; today, classroom and home share the same space. According to the United Nations Educational, Scientific, and Cultural Organization (UNESCOb), as of May 21, 2020, there are more than 1,213,390,181 students who have been affected by restrictions due to the pandemic in Costa Rica.

In March 2020, Universidad Nacional closed its doors to face-to-face lessons and immediately began the process for faculty to design the so-called "contingency plans" through which the development of courses in the remote synchronous modality was planned, with the aim of not interrupting the academic term. After temporary isolation and providing continuity of education, universities have turned their attention to the benefits of virtual education or education with the support of technological tools. (Quintana, 2020).

During this adaptation process, each professor took on the challenge of quickly reinventing themselves to start working in a different way,

designing learning and evaluation activities in the remote synchronous modality.

In this sense, López (2017) warns that the use of ICTs as supporting tools in teaching should be based on a constructivist model:

Currently, there are various digital tools or interactive environments on the Internet that allow the implementation of learning activities under a constructivist model. With these, students can build their own knowledge through the development of digital products (videos, animations, models, etc.) or the generation of strategies to solve challenges or problems through ludic environments. (p. 98)

The closure of educational institutions raises significant challenges in a context that drastically widens the learning gaps among the population. The changes experienced by humankind have transformed the way life, society, and culture are organized, creating an era of metamorphosis for people (Mejía, 2015).

It is in this context in which virtual education emerges as the best option to provide continuity to the teaching-learning process, allowing the teaching and student population to adapt to the preventive provisions of isolation established by the Presidency of the Republic of Costa Rica and the Ministry of Health of Costa Rica (Cáceres, 2020). This is how online education appears in a totally new context as a teaching-learning process which changes the traditional curriculum, including boards and classroom, to a totally virtual distance modality.

The challenge is that, for the first time, in a short period of time, and without previous preparation, the teaching-learning process has to be modified and the professors, who used to give face-to-face lessons, are forced to plan, build, measure, and evaluate their courses virtually from their homes directly to the students' homes, thus facing three great challenges: activities such as teaching online demand a redesign of the evaluation system and knowledge of the technological tools to be implemented (García-Peñalvo, 2020d).

Since the beginning of the pandemic, a significant number of professors were not trained for a total virtualization of their classes. They took on the challenge of learning in a very short time

the use of ICT tools to develop mediation strategies that would allow them to implement their classes, as well as to have the possibility of recording and transmitting live from their homes, managing to communicate with their students. The process of moving from traditional face-to-face classes to virtual classes and the innovation that this entails had a direct effect on the increase in professors' working hours, not only in the preparation of mediating material, but also in the time spent with students during the course of each day. The use of ICT tools (Zoom, Microsoft Team, and others) as a support for teaching has allowed to continue the teaching process by each professor, making the most of these tools (García-Peñalvo, 2020e).

Durán (2020) states that:

Given the current pandemic, and due to the quarantine situation that some countries must face, it is difficult to have face-to-face activities with the student body. So all those methodologies that require direct interaction with students are no longer valid, and other virtual methodological strategies must be sought in order to develop the curricula associated with the different curricular activity programs. (p.12)

The second challenge has been the students' insufficient competitiveness and access to technological tools, which conditions and restricts access to digital resources, such as videoconferencing platforms used for the mediation of learning by faculty. The use of different digital tools facilitates the understanding of pedagogical content by students in virtual classes (García-Peñalvo, 2020c).

Finally, a third challenge has been the role that each professor has played in motivating, providing psychosocial and emotional support to their students. The inability to use ICTs affects the performance of many students in the execution of their virtual tasks (Lozano-Díaz et al., 2020). For the student population, the confinement has affected a very sensitive aspect of their teaching-learning process: the impossibility of sharing with their peers and professors in the training center, of socializing and allowing them to develop properly. It is here, in virtuality, where professors are called upon to provide a relaxed environment, conducive to learning, in which they interact and socialize (Vélez, 2020).

Faced with these challenges, the Chorotega Regional Location has established permanent actions to support the use of information technologies in pedagogical mediation in the different courses taught, allowing professors to have at their disposal applications and resources to enhance mediation in synchronous and asynchronous virtual environments. As some authors point out, governments have implemented multiple strategies to confront this pandemic, where the most frequent measures include health information campaigns and isolation (Cobo Rendón et al., 2020).

Undoubtedly, difficulties bring opportunities, as is currently the case, which allows reflection on teaching as a career and the role of each educator in the teaching-learning process within the innovation of information and communication technology tools. In view of this panorama and with the intention of going into detail about the elements that have influenced the faculty when moving from face-to-face to virtual environments, we decided to carry out this research at the Universidad Nacional de Costa Rica, Chorotega Regional Location, Liberia Campus.

Theoretical Framework

Costa Rica reported its first case of COVID-19 in March, which coincided with the start of the academic year. The global pandemic took higher education institutions by surprise. With the interruption of face-to-face classes, a large number of professors at the Universidad Nacional, Chorotega Regional Location, migrated their courses to online platforms such as Moodle, making it the official platform of the university. In the same way, technological tools such as Microsoft Teams, Google Meet, Office 365, Hangouts, among others, were made available.

Vera et al. (2014) explain this process:

This situation shows that there is a need for professional training and professor updating in the use of ICTs integrated into the curriculum. Therefore, it is necessary to point out as a problem the need to identify reliable and valid

measures, but also to propose analytical methodologies that provide us with data for continuous improvement in professor training in the use of ICTs in universities. (p.146)

Among the many challenges facing the Chorotega Regional Location of Universidad Nacional is knowing how to deal with the multiple levels of access that students have to technology, access to the Internet, and the lack of equipment available.

In this sense, Aguilar-Ródenas (2020) considers that:

The COVID-19 confinement has given us the opportunity to reflect on many things, and we have also seen all the things that do not work. Teachers at all levels of education have had to adapt their classes and research to be able to continue working with our students. This demands great effort because we have had to improvise, there has been a problem of access to many resources that have had to be made up for or that were insufficient or non-existent in some cases, and, in many homes, there has been the added problem of having to take care of children or elderly or dependent people. (p.1)

In the case of Universidad Nacional, they provided their students with resources for connectivity and course participation, such as SIM cards to 3,000 students across the country for wireless internet access and 500 tablets in the Chorotega Regional Location.

As far as the academic effects are concerned, it is important to note that few professors had the necessary training or experience to deliver their lessons online. In this context, virtual education is shown to be the option that can best adapt to the preventive confinement provisions established by the Costa Rican government, since it offers multiple possibilities for learning from home and thus acquiring new knowledge in multiple areas or continuing the learning process in the face of the threat of contagion.

In relation to the above, Cassany (2014) points out the following:

There are numerous virtual tools that professors and students use to carry out the educational process. Each and every one of them has great advantages and provides numerous qualities to carry out the teaching process focused on the student, a process that adapts to the demands presented by society. (p. 105)

Since the appearance and spread of COVID-19 in our country, university professors have been searching for new ways to conduct the teaching-learning process so as not to interrupt the teaching term. It is worth mentioning that some authors propose greater investment in human resources and technological equipment by universities, which should be capitalized on and oriented to increase their educational supply with the support of technological tools in times of pandemic (Pérez-López et al., 2021).

In the same way, it has been necessary to research and analyze the transition from the face-to-face to the virtual modality—within the legal statutory framework—and teleworking. Undoubtedly, this change from face-to-face to virtual modality has been easy for many professors, but for others, not so much. Consequently, the effects caused by this global pandemic have been devastating in all academic spheres (García-Peñalvo, 2020a).

The academic supply of higher education institutions in the country is extensive. Each program has its own characteristics and peculiarities that make this change of modality a novelty and a challenge. Universities have found themselves, very rapidly, need of radically transform the long-established way of doing its work.

To this effect, Cassany (2014) states:

The generic term "good practice" includes a variety of elements, ranging from specific tasks (searching for information on the web) to quite general features of a teaching style (dispensing with the textbook). With all the limitations that this implies, our intention is only to group together different common characteristics that we have found in professors [...]. (p.4)

No matter how much time is allowed to come up with ideas on how to thrive virtually, we are definitely in a turning point from which there is no turning back: the digital revolution. We are now part of a change in the access, storage, and distribution of digital resources, namely the electronic digitization of information and communication (Mezarina et al., 2014).

COVID-19 has caused many professionals to radically change their work routine, including professors. In this research, we study the adaptation to this new circumstance and the change from traditional face-to-face methodology to a distance one in a short term.

Method

Given that the topic developed in this research has not been addressed at the Universidad Nacional, Chorotega Regional Location, Campus Liberia, the study is exploratory in nature. It is also descriptive, because it aims to detail the impact suffered by professors in this university due to the methodological change of the teaching-learning process from face-to-face to virtual modality as a result of COVID-19.

Design
The study was designed based on a mixed research approach of a quantitative nature that uses data collection in order to establish patterns of behavior (Hernández et al., 2014).

Its qualitative approach differs substantially from quantitative research as the former is not based on numbers or measurements (Kerlinger & Lee, 2002).

Participants
The study involved 85 professors from different programs of the Chorotega Regional Location of the Universidad Nacional de Costa Rica, in Costa Rica, under a non-probabilistic sampling within a period of time (the first term of 2020), where classes were conducted remotely and synchronously. A structured and closed questionnaire with few questions sent by institutional e-mails and by telephone through the digital application WhatsApp was used. A non-probabilistic sampling technique was used, using as sampling frame the number of professors provided by the Academic Direction of the Campus under study. This sample offers a maximum margin of error of 5%, with 98% confidence.

This sample is made up of 48.2% of male professors and 51.8% of female professors. Of the total, 19 teach courses in Business Administration; 14, in Hydrological Engineering; 11, in Information Systems Engineering; 10, in Business Management for Sustainable Tourism; eight, in Pedagogy; nine, in English Teaching; seven, in Commerce and International Business; and seven, in Humanities. In terms of the age of the teaching population, 42.4% are aged between 31 and 40 years, followed by 32.9% of professors between 41 and 50 years, and 21.2% who are between 31 and 40 years old. There are 21.2% teaching at the Liberia Campus over 50 years old, and the lowest percentage, 3.5%, are between 20 and 30 years old.

Instruments
For data collection, an ad hoc instrument was designed, which was applied online through the Google Forms platform and self-administered by the sample of professors. The questionnaires were applied in the period from May 20 to June 7, 2020.

Procedures
This research was carried out in three stages: in the first stage, an online form that responds to the survey technique was designed using the Google Forms platform. The second stage consisted in inviting via email the target population of the study to answer the questionnaire.

The participants were contacted through the University's institutional email address. In addition, the questionnaire was applied electronically (online) and, before applying it, participants gave their explicit consent to participate voluntarily and anonymously.

Data Analysis
The analysis of the data shows a set of results, which in turn respond to the objective of the study (Lozano-Díaz et al., 2020). It should be mentioned that, at this stage, the ethical aspects that the study entails have been established for the participants, respecting their anonymity in the preparation of the questionnaire and guaranteeing implicit consent when each participant decides individually to respond on the electronic platform.

The final stage consisted of the analysis of the data, as well as the interpretation of each of the responses. The answers to the open-ended questions of the target population of the research were subsequently coded and detailed with the data mining method based on identifying and quantifying through text and natural language analysis metrics.

Similarly, the statistical analysis used is descriptive, based on frequencies and percentages. Additionally, the different experiences and perceptions that the faculty faced when confronted with sudden adaptation from face-to-face classes to virtual modalities were found out through two questions in the questionnaire that allowed for open-ended responses. The results show that, in the campus, the faculty encountered several barriers to implement the university didactic methodology through virtuality due to the lack of knowledge of platforms and mediation tools.

Results

In the first weeks of the quarantine, the professors began a challenging phase of self-learning for the use of information and communication technology to support teaching. This involved not only the search for tools, but also learning to use them and adapt them to the particularities of each class without losing sight of the objective of quality education to shape critical and analytical individuals. On the other hand, the administrative management team begins the process of recognizing the existence of adequate conditions within the university campus, such as internet connection, technological equipment (virtual classroom), among others, for the access of faculty.

As part of the process, the educational administration management team asks professors to thoroughly plan the academic mediation, which seems to have generated—as indicated by the professors themselves—a lot of anxiety due to the lack of the necessary digital skills for online teaching. The results of the survey show that the lack of knowledge of virtual pedagogical mediation is clear, since 70% of the faculty state that this is the first time they have taught lessons in the virtual modality. This result explains the perception of some professors that the face-to-face classes have been transformed only into "tedious videoconference sessions," without any pedagogical adequacy. However, 85% of professors consider that they have made an effort to research, innovate, and propose to the student population a set of activities to make learning more rewarding. Therefore, we can present the first findings in the research, which aims to establish the impact of the methodological change of the teaching-learning process from face-to-face to virtual modality as a result of COVID-19 on the professors of Universidad Nacional of Costa Rica, Chorotega Regional Location, Liberia Campus.

As mentioned by Contreras (2020):

The way we educate is changing.

Face-to-face systems are moving towards mixed systems in which face-to-face teaching, educational platforms, and the use of ICTs coexist. Enrolment rates have also increased through purely virtual learning systems. The transformation of education is irreversible, both in the use of the media and in the educational models used, making it necessary to move from classical models to constructivist models that adjust better to the new reality and allow students to build their own knowledge. (p. 9)

There is no doubt that the pedagogical transformation in the face of the COVID-19 crisis took the academy by surprise. The bewilderment has been felt to a greater extent by professors who had never approached pedagogical tools that have been available for a long time, such as the virtual classroom, Zoom, Microsoft Teams, Google Meet, and all the platforms for virtual education. As mentioned by some of the authors consulted, we are in the era of technological tools, such as Zoom, Google Meet, Teams, and many other videoconferencing systems. (Moreno-Rodríguez, 2020).

In the same way, within the findings of the research, it can be mentioned that all the faculty has been able to connect to a wireless network (Wi-Fi) at home to carry out their teaching activities in the virtual modality; however, 28.5% of the faculty to have also connected to the Internet with their

postpaid cell phone data and 4.7% with prepaid cell phone data. Likewise, 3% of the faculty have taught their lessons using the university's internet. Regarding the time spent per day designing and executing their virtual classes, Figure 1 shows that 44% of faculty spend between four and seven hours on these tasks; 29% of faculty, one to four hours a day designing and executing lessons; 25%, more than seven hours a day designing and executing classes; and two people, up to 10 hours a day on these activities. Figure 1

These results should be analyzed considering that 83% of the faculty say that they are dedicating much more time to planning and executing their classes in virtual mode when compared to face-to-face classes. It has been evident that professors with little knowledge in the use of technological tools have had to make an enormous individual effort, since the quarantine prevents them from having the help of those colleagues who solve computer problems within the university institution. This individual effort has been accompanied by the support of university colleagues both from the same university and from other higher education centers, as well as by the help of the young sons and daughters of the professors who participate in the search for digital resources.

This data is striking, given that 70% of the faculty mentioned having "sufficient mastery of the tools and strategies of virtual teaching" and only 30% considered that they have little mastery in the use of tools and strategies. Therefore, it is in other aspects of virtual classes where the explanation for the additional time spent can be found. The reasons given by the faculty for these additional hours were related, in general terms, to the additional support for the student population. Thus, the faculty considered that, in order to ensure the participation of the students on the other end of the screen, they must carry out activities for each subject, such as tasks or forums, and this then translates into a lot of work to be reviewed for each group. In this sense, some professors expressed opinions such as: "interesting but exhausting experience."

Of the faculty, 70% considered that it was more difficult for students to understand some of the content of the subject due to the virtual modality, which may explain the dedication of more time to the preparation of lessons, since 81% of the teaching population feels that they had to make a greater effort to support their students in their learning compared to face-to-face classes. In addition, a little more than a third of the professors surveyed expressed feeling pressured and overwhelmed to go through the contents under this virtual modality. The circumstances experienced with the COVID-19 health emergency around the world have manifested themselves in different ways and the faculty is no exception.

The faculty mentions various particular situations related to the pandemic that have harmed them and their families and have had an impact on their performance as professors.

Figure 1

istribution of the Sample According to Sociodemographic Variables: Gender and Sport
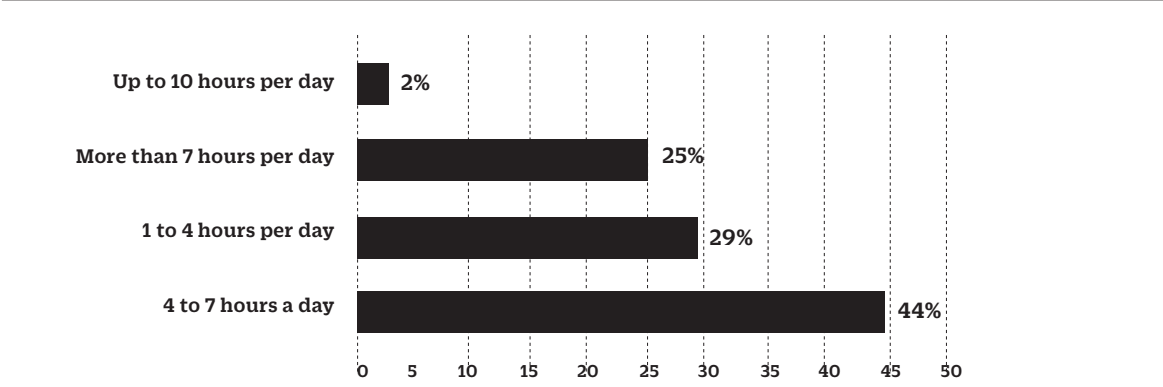
Mental health is the main one, since anxiety, pressure, and stress are constant as a result from permanently living in "virtuality" and also in permanent coexistence and confinement with family members, who also require attention, as children receiving virtual classes. In addition, physical symptoms are mentioned, such as headaches or sore eyes sore eyes from exposure to computer screens, or back pains from hours of sitting, revising, checking, preparing, assisting students, and teaching lessons.

Similarly, it is noted that the additional working hours may be due to improper organization of time. Although seven out of 10 said that they have sufficient mastery in the use of existing tools and platforms, at the same time, they expressed a lack of knowledge in the use of existing technologies and demanded advice and training in the use of the tools. However, there were few who mention having used the learning platforms generated by the university.

The percentage of use of different pedagogical mediation platforms used by the faculty to teach classes in the virtual modality is shown in Figure 2. The institutional virtual classroom is used by 96.5% for their pedagogical mediation, in addition to WhatsApp and Zoom with 89% and 83% of use, respectively. It is interesting to note the mention of WhatsApp, considered by professors as a mediation platform, although it is an instant messaging application that allows sending and receiving messages via the Internet.

Given that faculty can send images, videos, and voice messages, this type of communication is considered a form of mediation with the student. Figure 2

Regarding the pedagogical mediation strategies implemented to teach classes in the virtual modality, Figure 3 shows that in practically 90% of the cases, the faculty used individual tasks with the students to teach their classes. The second most used strategy was videoconferencing or video calling in real time or synchronously, which coincides with the tools and platforms mentioned for teaching classes. On the other hand, in third place, 80% of the faculty mentioned group work as a mediation strategy. Possibly these works, both group and individual, are related to the other mentioned strategies such as: web videos (70.6%), online forums (64.7%), electronic books (40%), scanned documents (36.5%), or online questionnaires (50.6%).

Figure 2

Platforms for Pedagogical Mediation Used to Teach Classes in the Virtual Modality.
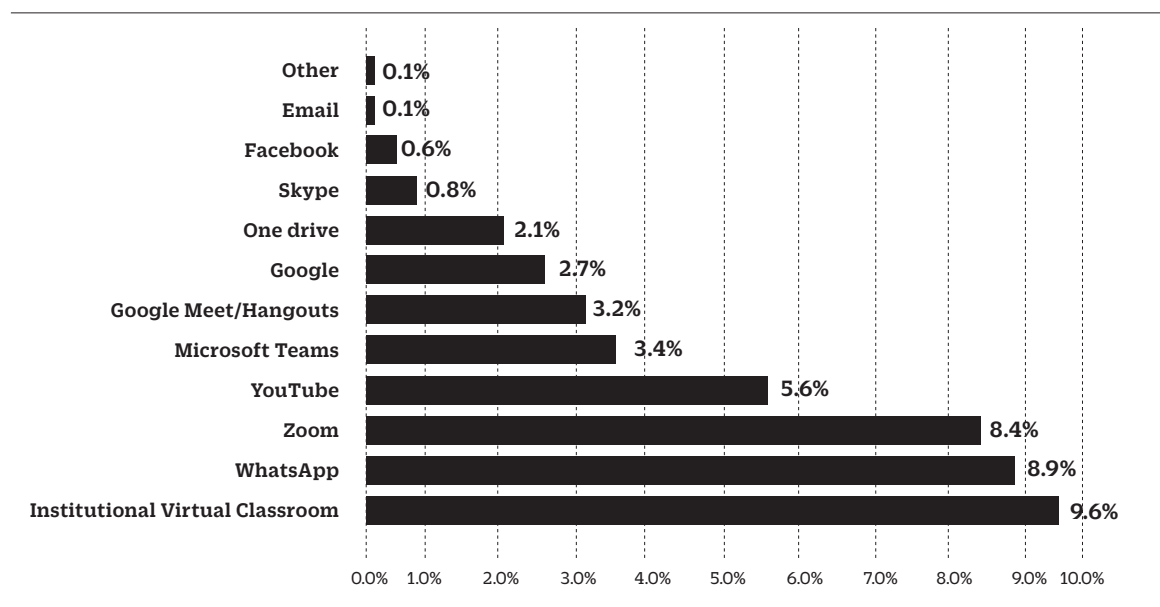
Given the significant use of the institutional virtual classroom, it is highly likely that assignments and documents were submitted through the classroom's file and tag tools, as well as homework submissions, forum participations, or online quizzes. It is interesting to note that 40% of the faculty mentioned having made pre-recorded videos with the lessons to be shown to the students. In this sense, it is valuable to note that the faculty repeatedly mentioned that the fact of having recorded lessons, either by videos produced by themselves or by the lessons recorded in Meet, Zoom, or similar platforms, is one of the positive characteristics of the virtual media, since it allows the students to listen again and review the lessons.

14% of faculty mention other mediation strategies, including: tests, Microsoft Power Point with recorded voice, documents of own elaboration, chats and personal recordings, articles, and website notes. Figure 3

The professors mentioned several actions that could be implemented in order to improve the process of virtualization of the courses they teach. Some activities are the need for training in virtual environments, both for faculty and students. It should be clarified that the Universidad Nacional has made multiple efforts in this sense through the Vice-Rectorate of Teaching and the Chorotega Regional Location. However, it is not yet clear whether these efforts have been seconded by professors individually, participating in them and using the information that has been made available to them.

In this sense, it is interesting to note the mention of the need for training and advice on virtual mediation that is adapted to each specialization. Higher education institutions are working hard to try to maintain learning methods using virtualization-based guidance (Hodges et al., 2020).

The improvement of pedagogical mediation is closely related to access to technology, both in terms of equipment and internet access, which has been considered a limitation for the faculty to be able to communicate fluently with the students.

Overcoming technological illiteracy can offer opportunities for better universities, so it is necessary for academia to encourage faculty to get training in the use of various platforms, not only in the Virtual Classroom and its tools, but also in other existing tools and platforms that allow not only to implement virtual classes, but also to support face-to-face classes.

Figure 3

Strategies of Pedagogical Mediation Implemented to Teach Classes in the Virtual Modality
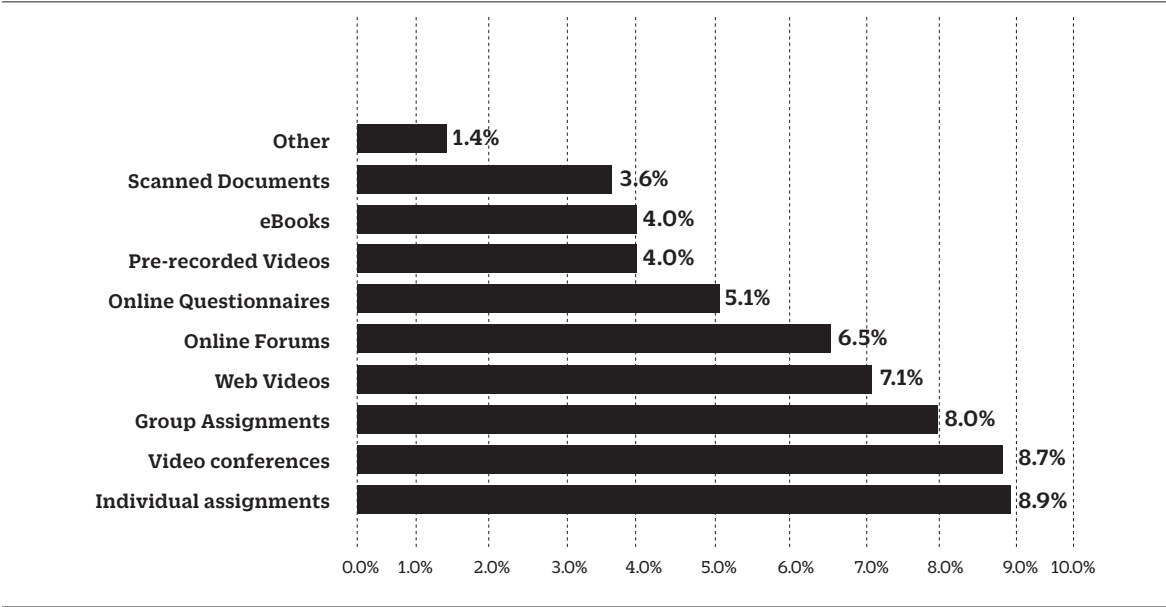
Discussion

As stated by Álvarez et al. (2020), Sandoval (2020), and Tejedor et al. (2020), professors have used tools in order to strengthen the teaching-learning processes, expressing the need to renew pedagogical, didactic, and technological knowledge. Similarly, spaces such as virtual classrooms are used as complementary options to teaching, switching between them depending on the benefits offered by the platforms, as described by authors such as Crespo & Palaguachi (2020), De Luca (2020), Nuguer & Powell (2020), and Vergel (2020).

In this context, the results of other research works, such as those of Arancibia et al. (2020), Espinel (2020), Laro-González (2020), Medina et al. (2020), and Gutiérrez et al. (2020) regarding teaching challenges in pandemic-like situations, result in an openness to new knowledge and a positive attitude towards integrating face-to-face training with the help of technological tools. This gives rise to pedagogical innovations, as spaces for complementary and continuous updates in relation to ICTs.

As mentioned by Molinero & Chávez-Morales (2019), at the beginning of the pandemic, the device most used by students in the classroom was the personal computer, and the most used applications were Facebook, Drive, and YouTube.

Currently, in the context of the pandemic caused by COVID, universities are challenged to provide conditions to the faculty, seeking continuity in the teaching-learning process, thus avoiding the interruption of student learning, reducing distances, and ensuring that knowledge does not face barriers. Today, professors face a great challenge, as is the use of technological tools for university teaching, moving from face-to-face to virtual modalities.

It is important to establish what changes are not easy to achieve, given that traditional face-to-face education has changed due to the pandemic caused by COVID-19, where professors have had to resort to the use of ICT tools to continue with their teaching and learning methods, benefiting learners, who do not see their learning process interrupted.

Authors such as Toribio (2016) mention that there are multiple experiences with ICTs to support teaching. In the same way, Jordá-Borrell and López (2020) and Wenczenovicz (2020) mention that it is inevitable to face difficulties with ICT tools that strengthen the teaching-learning process.

The virtualization of teaching-learning processes does not begin in the context of COVID-19 (Llorens, 2020a). With the onset of the pandemic caused by the SARS-CoV-2 virus, professors' work schedules were interrupted, not for 40 days, but for months. Gradually, they filled up again, with access to conferences and new online learning that previously had not been available. We find ourselves in a context where an analysis of the ways in which educational processes are being transformed in the COVID-19 era is unavoidable (Fardoun et al., 2020).

In this context, there is evidence that we are facing a new reality from which we must learn and create components and solutions to transform virtuality within the educational process. So in this horizon, the professor must build alternative methodologies for the development of didactic material, seeking that the direction to teach their classes are clear, and an environment that favors the contribution of students is preserved. In relation to the elements found in this research, they agree with Giannini, S. (2020), when stating that professors are not prepared to face this abrupt shift from face-to-face to virtual modalities.

There is a consensus that, as professors, we must make every effort to narrow the deep gap between those who have the technological resources and those who do not, those who will return to the university classroom and those who will not. And it is in this context, in a world intertwined with pain, anxiety, fear, and worry, that a sense of opportunity also emerges. The pandemic and its consequences are the opportunity to accelerate a process and manifest aspects in the world of teaching that had to happen. It has been a "forced" invitation to look at reality and seek different ways of teaching.

In the present research, it was established that professors perceive that much more work is required in the teaching-learning process under the virtual modality, due to the multiple tasks that are added to the teaching activities. There is an increase in academic activities that

demand more time in front of the computer, more individual burnout due to the difficulty of verbally explaining the subject in a virtual setting, as well as an increase in the revision of work due to the changes made in the evaluations, as well as other methodological strategies. In the same way, there is an increase in the effort to rethink academic elements to reach the entire student population by following up in a group and individual way through the use of technological tools such as Meet, Zoom, Teams, and WhatsApp, among others. It is essential to clarify and filter the concepts related to online education and virtuality, where the "emergency education" that is being formalized does not always represent this modality (García-Peñalvo, 2020b). The changes in education that are now taking place with the support of technological tools provide a series of advantages and benefits that make it possible to continue with the teaching-learning process (García-Peñalvo, 2020f).

The results obtained are not unrelated to other research in which the novelty that these processes meant, both for the institution in general and for the professors in particular, is evident. It is in this aspect that the virtual processes must change, being clear that "the evaluation is linked to the lack of institutional experience in this area, since these processes have not been practiced or tested in non-face-to-face settings" (García-Peñalvo et al., 2020, p. 12). Although they pose a challenge, there were cases of global success in innovation with current and future professionals (Ferdig et al., 2020). We are living an unprecedented moment in the history of higher education where the use of technological tools such as Zoom and Microsoft Teams, among others, provide many benefits and advantages (García-Peñalvo et al., 2020). Due to the isolation in our homes, the university community has had to adapt to a model of remote teaching, which has favored and benefited the teaching-learning process (Llorens, 2020b).

Teaching in the contexts of uncertainty that COVID 19 produces requires creativity and flexibility to allow students to develop new skills and abilities (Bosquez et al., 2018) and to integrate new knowledge and learning from the courses in a virtual or online environment in order to get out

of this situation with better tools and being better human beings (Ramírez et al., 2020). Teachers face the formidable task of contributing to the teaching-learning process and, at the same time, building a different reality, which allows a different type of education. (Area-Moreira et al., 2018).

Likewise, the professors surveyed state that it is necessary to promote training with the objective of acquiring strategies in which learning is provoking, motivating, and contextualized, and in which the particular pace of each participant is taken into account.

The results of this research reveal a reality in which professors require constant training in the use of technological tools to support teaching, both for face-to-face and virtual classes. The pandemic came, and professors found themselves with no classroom and, to a different extent, in virtuality (Fernández, 2020). Online teaching allows for greater control of student interaction, which results from seeing this participation in the context of continuous assessment of disciplines (Abella et al., 2020).

The education system is not really prepared for distance education, since, as Baptista-Lucio et al. (2020) state, students also do not have sufficient autonomy and responsibility in their own learning. Teachers have a limited margin in the choice of content. During the pandemic, at least, professors have done what they can, as a matter of survival. Just as the pandemic has changed hygiene in social interaction, it should also bring about changes in the way all educational actors teach and learn.

Within this framework, a new role is also established for the student population, the raison d'être of the university and the target agent of the virtual environment. Undoubtedly, students assume a leading role in which they are required to be willing to learn and develop skills for collaborative work and self-learning from the autonomy of their own home. The use of technology has had an unquestionable impact on the teaching-learning process, where its use has had multiple benefits (Figueroa, et al., 2021).

It is for these reasons that a restructuring of the university teaching role is urgent. The health crisis and its consequences have given the opportunity

to generate a change in which to shift from face-to-face to virtual environments. Professors must be updated in the use of technological tools to support their teaching practice, and the aim should be to improve training related to the implementation of courses through digital platforms, to digital assessment methods, and to changes in the time required by students in the teaching-learning process.

In summary, the role of professors in virtual learning processes is to recognize the realities of the students, always trying to achieve the educational goals with a creative, active, and affectionate role in response to the student community that converge in the virtual lessons. Thus, the transformation of the teaching role requires a process in which both training and the availability of technological tools coincide in order to achieve an organization level that adapted to the current context of virtual lessons. In a general framework, the majority of universities find themselves in similar scenarios and face the situation through heterogeneous measures depending on the particular context of each nation (Grande de Prado et al., 2021). What is certain after the pandemic caused by COVID-19 is that university education as it was known no longer exists (Suárez, 2020).

In this context, faculty must carry out transformations in the learning process in which pedagogical mediation in remote synchronous modality is not a replica of the face-to-face class, and in which there is pedagogical coherence between learning objectives, pedagogical mediation activities, evaluation, and feedback. University professors must know and apply ICT tools that facilitate the teaching-learning process (Navarro, 2020).

This fosters interaction and socialization, builds knowledge, and ensures that the learner is not only a passive actor. It remains the task of the academic management teams to convene a process through which they work not only on the planning of the next academic term. The articulation of ICT tools in the virtual context of classes generated by educators has given new impetus to pedagogical processes (Sandoval, 2020).

In the immediate future, technological advances must be taken advantage of to promote innovative and collaborative education, in which the faculty and the student population manage to master the technological tools by implementing a strategy of constant updating and training of faculty in the use of resources to support the planning and development of remote synchronous courses. Undoubtedly, the pandemic caused by COVID-19 has had a detrimental impact on university professors around the world (Vidal et al., 2021).

The objective of this research was to determine the impact of the methodological change of the teaching-learning process, from face-to-face to virtual modality as a result of COVID-19 on the faculty of Universidad Nacional of Costa Rica, Chorotega Regional Location, Liberia Campus. Some questions arise from this:

What lessons have been learned from all this? We still have few answers; we have seen difficult days. Being a professor at Universidad Nacional has provided support, not only economically but also spiritually. Is this support being transmitted to the students outside the classrooms today? The university campus is a place for convergence. How about now? University has become something "less pleasant": there are no breaks, no lunches in company, students no longer see their friends, professors no longer see their colleagues; instead, the only things that remain are homework, research, presentations, endless class preparations in remote synchronicity. Students end up overwhelmed and tired of work guides, readings, videos, forums, and having to be in front of the computer all day, while professors end up overloaded and stressed.

Last but not least, faculty must be aware of the conditions of the student population that does not have access to technological tools, connectivity and, especially, economic, social, and affective conditions that allow them to use their abilities to the fullest in the learning process.

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