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TECHNOLOGICAL MEDIATION IN UNIVERSITY EDUCATION DURING PANDEMIC TIMES

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Abstract: This article establishes an analysis of the scenario generated by the COVID-19 pandemic in relation to higher education processes. In this sense, it initially identifies the way in which higher education institutions had to create contingency plans that would allow them to continue with their educational activities, which led them to focus on technological mediation, seeking to reduce the negative impact of the crisis. The study establishes the development of a descriptive methodology focused on three specific phases related to the training, adaptation and implementation of the new training environment at ``*Colegio Mayor del Cauca*`` University Institution (Colombia), supported by the Moodle platform. The training process focused on the use of technological tools was largely due to the importance of the way it has been conceived within ``*Colegio Mayor del Cauca*`` University Institution in the COVID health emergency in which different dimensions intervene such as the organizational, communicative, technological and pedagogical ones that facilitated the enlistment of technological resources and their implementation in the teaching and learning processes aimed at students and teachers, finally allowing this proposal to allow the Institution to overcome the crisis generated by the pandemic. In this context, it is found that technology is increasingly becoming a strategic factor in education, but it requires continuous improvement and updating by users, in addition to adjustments at the methodological and evaluative level. Taking into consideration, the above, technological mediation becomes an important alternative to contribute to the improvement of training processes and therefore they must be dynamized within the incorporation of these resources.

Keywords: Pandemic, Education, Technological mediation, pedagogy, higher education.

INTRODUCTION

Until 2020, the vast majority of higher education institutions in Colombia had technological mediation as an alternative with little impact on their mission component. Some isolated practices (Chehaibar, 2020), slight approaches to virtualization processes and the use of Information and Communication Technologies (ICT) in education were part of the experience and introduction of technological mediation in their training processes. With the pandemic generated by COVID 19 (WHO, 2023), it was necessary to rethink the initiatives and dynamics based on the use of ICT as a mediating element in the processes of interaction, communication and training between the different actors in the academic environment.

This way, some technological tools became a fundamental pillar in the development of teaching and learning processes, based on the need to exchange information from different places and conditions. Thus, videoconferencing platforms such as Meet, Zoom and Teams (Adame Añorve, 2013) came to play a significant role in education. Likewise, the LMS (Learning Management System) educational management platforms became allies to overcome the conditions of mandatory isolation and generated new spaces through which to continue the development of the different training and communication activities.

The above clearly required the design, structuring and implementation of various training activities for the different members of the educational community of the ``*Colegio Mayor del Cauca*`` University Institution, on which the analysis process presented here focuses. This way, through the adaptation dynamic, supported at a technological level by the experience of the Virtual Learning Tools (HEVIR) research group, an alternative based on the use of digital tools is proposed, in order

to adequately face the new training scenario brought about by the pandemic.

During the process it was necessary to consider three factors: the training of the actors in the use of tools, the preparation of the necessary resources for the new educational dynamics and the implementation and use of the same. This way, a task was established to be able to comply with academic activities, but also with the demands of the control entities such as the Ministry of National Education, whose guidelines were focused on continuing training at all levels remotely.

Thus, the study allows us to observe the potential in relation to the use of ICT, but also the shortcomings and needs in relation to their proper use and exploitation, which implies thinking not only about the possibility of having them, but also about the urgent need to train teachers and students in their daily use, in addition to the unavoidable change in relation to teaching practices and the methodological process in relation to the development of the topics or content of the subjects or academic components, because more than a simple channel, technologies become a new scenario, with new ways of teaching and learning.

PROJECT

The project "IMPACT OF TECHNOLO-GICAL MEDIATION IN EDUCATION: EXPERIENCE AND PROSPECTIVE, CASE STUDY OF THE COLEGIO MAYOR DEL CAUCA UNIVERSITY INSTITUTION". is related to teacher training processes that began in 2013, in which a cohort of teachers was trained, which was resumed in 2019 with the training of four cohorts until 2020. In this process, conceptualization, pedagogical and content generation elements were addressed, interacting with the Moodle platform. In addition to the above, it is of great importance to highlight the training process in the manage-ment of resources to face the crisis generated by the COVID health emergency.

ACTORS INVOLVED:

Members of the HEVIR Virtual Learning Tools Research Group, teachers at ``*Colegio Mayor del Cauca*`` University Institution.

PROPOSED GOALS

The following objectives were set for the development of this project.

GENERAL GOAL

To determine the impact of technological mediation in education: experience and prospective case study of ``*Colegio Mayor del Cauca*`` University Institution.

SPECIFIC GOALS

• Measure the degree of technological appropriation by the actors involved in the educational process of ``*Colegio Mayor del Cauca*`` University Institution.

• Document the pedagogical, commu-nicative, evaluation and content genera-tion processes that serve as institutional references.

• Issue recommendations and proposals for improvement to future technological mediation initiatives in education within the Institution.

BACKGROUND OR THEORETICAL REFERENCES:

At a global level, there are important transformations that have affected everyday life from different points of view such as governance, political and social development, work and educational development, caused by the leading role of the new Information and Communication Technologies (ICT) to generate new dynamics in human performance. In this regard, (Yuni & Urbano, 2014) states

that ICT "has acquired a spectacular role as a social issue and its problems have overflowed the academic circuits...".

The above implies great challenges for educational institutions for which technological mediation is an element that facilitates the transformation in the development of the educational process and consequently it is of great importance to take a look at the past and see what is the panorama that is presented today and based on this, present a futuristic vision of the role that technology has played in facilitating access to different training programs that they offer.

Technological mediation leads to a look at the profile or role of teachers and students within educational institutions, in this scenario the teacher assumes the role of moderator to accompany the student in their training process and must adapt to the new criteria established to facilitate the teaching and learning processes of the student (Morales & Higueras Rodríguez, 2017) Technological mediation becomes a fundamental tool between the actors in the educational process (Muñoz Rojas, 2015), being of great importance the use of technological resources, whether their own or external to a LMS (Learning Management System), to facilitate synchronous or asynchronous communication processes to generate fluid communication between the different actors in the educational process that intervene in a virtual class in which teaching materials of different nature, activities and resources that facilitate the fulfillment of the training objectives by the students are made available to the student.

Therefore, to address mediation, it is very important to establish a relationship between it and technology, culture, communication, pedagogy and other aspects that constitute social dynamics. If technological and educational mediation is considered, these involve new dynamics that favor training processes, in the words of Diaz et al (Díaz Monsalve & Quiroz Posada, 2013) "New forms of everyday life" which implies new artifacts and new languages, taking into account aspects of great importance that cannot escape the educational act such as culture, society and configuring based on this an "educational technology" (Fainholc & Nervi, 2013), which enhances the dynamics of the teaching-learning processes emphasizing a curricular model, in pedagogical approaches through which network learning is enhanced, which can be described as pedagogical mediation.

Pedagogical mediation according to (Gutiérrez Pérez & Prieto Castillo) is expressed as "the treatment of content and forms of expression, of the different topics and competencies of the disciplines of knowledge in order to make the educational act possible, within the horizon of an education conceived as participation, creativity, expressiveness and relationality…".

The technological resources (Facundo, 2002) used in higher education can be classified into four levels which are related to the evolution that ICTs have been experiencing, which are mentioned below:

> Level, number 1 ICT tools are used only in teaching, without structural and pedagogical changes.
>
> Level, number 2: Digital media are used and virtualization processes of some academic management functions are initiated based on the publication of texts complemented with greater use of audio, video and one-way digital communication.
>
> Level, number 3 Virtual platforms are used to digitize and integrate different functions of higher education with greater activity and use of tools for management and monitoring.

Level, number 4 Uses virtual platforms that integrate various functions, educational structures enhanced with tools that facilitate learning by using curricular models, materials and resources that favor learning.

To escalate the levels of appropriation of technology as an element of mediation of the educational process, corresponds to training processes through which teacher training, the management of technological resources and their incorporation into the development of training processes are strengthened, making use of web 2.0 resources (Cobo Romani, 2008) which includes blogs, wikis, slideshare, social networks and other tools of the moment that facilitate educational development. In web 3.0 called the semantic web, they introduce a greater organization to the information contained in the Internet, facilitating the processes of searching for information on the network, which can be incorporated into the educational dynamics and finally in web 4.0 the important user experience in the development of content is highlighted. In this sense the project: IMPACT OF TECHNOLOGICAL MEDIATION IN EDUCATION: EXPERIENCE AND PROSPECTIVE, CASE STUDY UNIVERSITY INSTITUTION: ``*COLEGIO MAYOR DEL CAUCA*``, as an investigative dynamic that allows to understand the importance of mediation in ICT, an element of study to give feedback and transform teaching and learning in the Institution taking into consideration, the roles assumed by teachers and students.

METHODOLOGICAL PERSPECTIVE

Considering the new educational scenario, in which the development of new dynamics of interaction between teachers and students was required to carry out the teaching and learning activities of the project. The development phases are presented in Figure 1.

STEP 1

Considering the need to resume academic activities in the shortest possible time, considering the guidelines of the Ministry of National Education and based on the experience of the research group, this phase was carried out within a month, during which the training process was carried out for 180 teachers of the institution using the Adobe Connect tool, which allowed synchronous meetings to be held at different times for groups of teachers as graphically described below in Figure 2.

The training work focused on these three important knowledge topics, through which teachers could begin the adjustment process to the new training environment and what it implied in terms of teaching and learning dynamics with their students. Figure 3 illustrates the synchronous meetings of the training sessions that were held.

GENERALITIES OF VIRTUAL EDUCATION

Regarding the first topic, related to the generalities of virtual education, it allowed teachers to learn about the limitations, possibilities and potentialities that virtual education offers. It is conceptualized considering the vision of different authors, the review of experiences, the possibilities and challenges that it implies. This way, the review of basic concepts such as connectivity, network learning, autonomy and dosage of content is resumed. Likewise, educators
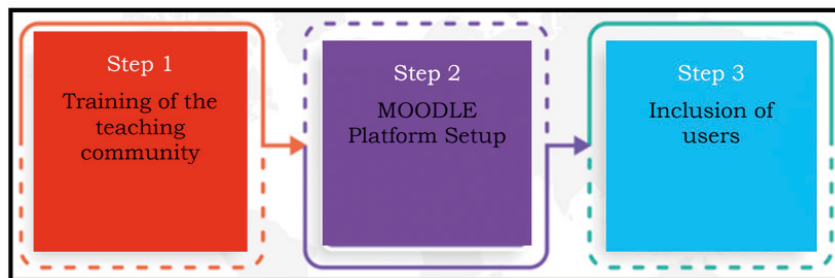
Figure 1. Phases for project development
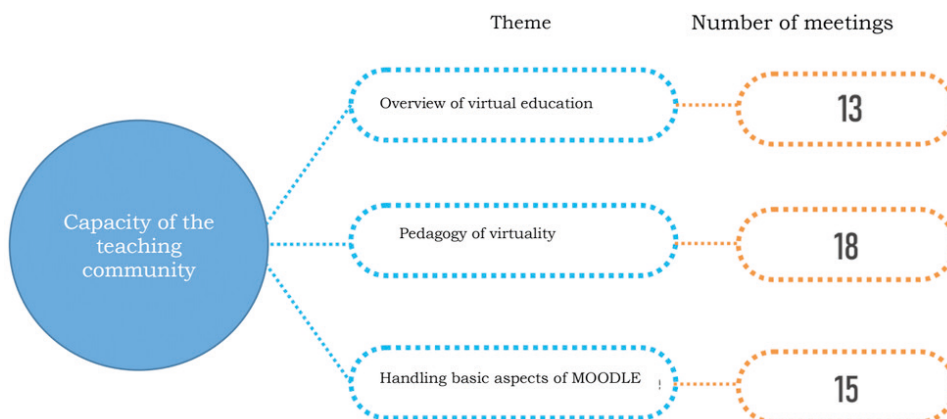
Source: own elaboration

Figure 2. Training for teachers at ``Colegio Mayor del Cauca`` University Institution.
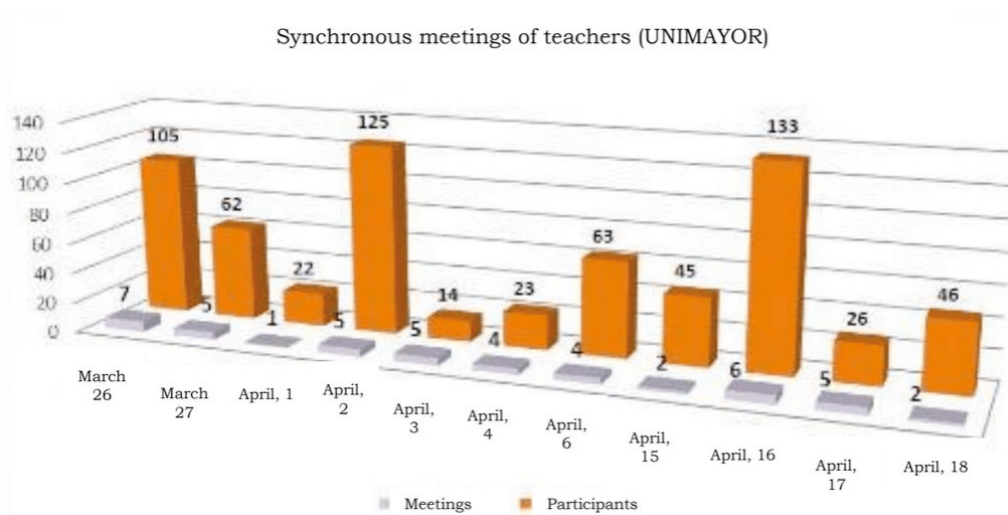
Source: own elaboration

Figure 3. Synchronous meetings with teachers

Source: own elaboration

acquire knowledge about the different trends in virtual education such as E-learning, B-Learning and M-learning.

In this context (Cookson, 2002), proposes four quality criteria that must be applied in distance and virtual education, effort, performance, efficiency and process, from which the level of compliance with the objectives and purposes of training can be measured and verified, on the other hand, in the application of these four aspects there must be a high commitment to research aimed at improving mission and support processes. Cookson's approach is not far from that proposed by the Ministry of National Education (MEN) regarding quality in virtual education, establishing four dimensions to achieve this goal as follows:

1. The organizational dimension.

2. The communicative dimension.

3. The technological dimension.

4. The pedagogical dimension.

The organizational dimension refers to the particularities and dynamics that must be developed in the educational institution that intends to offer virtual programs or courses. It is the way in which the organization assumes and acts in the face of the virtual. This dimension mainly involves the administration of the institution and is what makes it possible for the other dimensions to operate in a harmonious manner. It is vitally important that the educational institution that intends to incorporate virtual education into its offering thoroughly understands the implications that this entails. It has been usual for the virtual to begin as a topic for a few in the educational community, however, when courses and programs are placed in this scenario, the commitment of the entire institution is essential.

Pedagogical considerations must be at the forefront of any program that intends to be offered virtually. This guarantees that the entire framework that programs of this nature entail is harmonized with meaning and that it maintains a formative horizon. Without pedagogical reflection, there is a risk of losing our way, either because of the obscurity of technologies, believing that it is about doing the same thing, but in virtual classrooms. A virtual program must be designed taking into account the Institution's Educational Project (Unimayor, 2022) and therefore requires the intervention of the different actors.

In contrast to the communicative dimension (Universidad Externado, 2022), education is par excellence an act of communication. Those who teach and those who learn develop in interaction, in the exchange of arguments. There are no teachers without students and vice versa; the identity of one depends on the existence of the other.

PEDAGOGY FOR VIRTUALITY

The teacher training process is related to the pedagogical model (Aparisi, 2020) that must support the virtual education initiative. The socialized pedagogical model was strictly related to the active and differential pedagogical model proposed for the institution. This model considers the collective construction of knowledge respecting the difference and individuality of each subject. In terms of didactics, a mechanism is established that allows technological mediation between teachers and students. A didactics based on three basic components is proposed: introduction, development and conclusions. The introduction allows conceptualizing a certain topic, it is the preamble of the class and must clearly establish its objectives and scope.

The training process must be based on a theory, a concept or a certain application. The topic must be presented graphically without using large amounts of text and must be

supported by an example or exercise through which the concept is explained and above all that highlights its importance. The conclusions are key and serve as a conclusion of the class. This must emphasize the importance of the topic and its usefulness in the training process. The didactic proposal is illustrated in Figure 4.

HANDLING BASIC ELEMENTS OF MOODLE

Since 2009, mediations had been carried out using the Moodle LMS by the members of the HEVIR research group. This experience became the starting point for the materialization of the formulated proposal. Setting up a class in Moodle requires handling basic elements of the platform. Details are given about the profiles supported by the LMS and the differences between them. The role of teacher gives the possibility of activating courses and starting the process of building content. In Moodle, emphasis is placed on the handling of resources and activities, and within these, labels are a widely used resource.

The teacher becomes the content expert and will always have the support that allows him to publish a variety of elements related to it. One aspect that is emphasized is the one related to activities, which can be framed in those related to learning and those related to evaluation. The Moodle platform offers a wide range of possibilities in this regard: forums, questionnaires, tasks, workshops, among others. Multimedia materials are generated in video format and posted on YouTube for teachers to review. Figure 5 shows an example of a class uploaded to Moodle.

STEP 2

The preparation of the Moodle platform included technical aspects of parameterization. In this sense, a hierarchical structure was established that would allow, first of all, to define spaces for each of the faculties. The institution had three faculties at that time: Engineering, Art and Design, and Social Sciences and Administration. These offer five technological programs, 5 professional programs, and four postgraduate courses.

The parameterization of the platform included the generation of a hierarchy by faculties where each of them would group their respective programs and these in turn the module components (subjects) associated with their training processes. The hierarchical structure allows for better administration and an orderly grouping of programs and subjects. The creation of spaces for these included the following aspects:

- Creation of the course and assignment of codes

- Selection of the presentation format and file storage capacity

- Choice of the registration method

Each module component was assigned a space on the platform where teachers could share content with their students, which was possible thanks to the training process provided in the first phase. Figure 6 below lists the programs and module components created by program. Courses were created on the platform using the names defined in the academic syllabi of each program with simple parameterization, which allowed alphanumeric codes to be defined for each one. Regarding the selection of the presentation format for classes, Moodle presents several options for creating courses. These options include: grid format, topics in tabs, single activity format, social format, topic format, and weekly format. It is important to mention
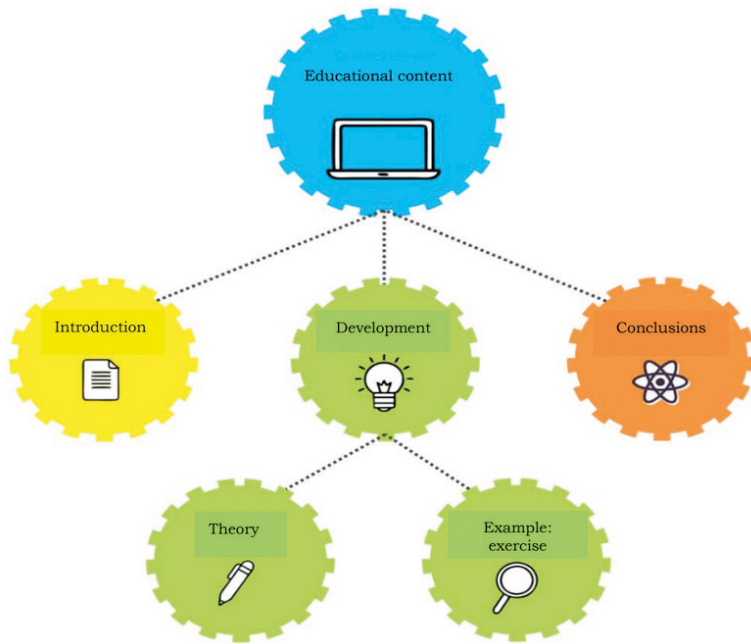
Figure 4. Didactic proposal

Source: own elaboration

One of the most important concepts introduced by Neumann is that of Main Memory; before (ENIAC and EDVAC) the term accumulator was used.

Figure 5. *Example of class uploaded to Moodle*

Source: own elaboration

here that the experience collected in a training process in 2014 describes good acceptance by teachers of the topic format and the tab format. The latter requires certain skills on the part of the teacher, which is why the topic format is selected as the presentation option for class topics. The training provided to teachers in the first phase was based on this presentation format. The storage capacity of the platform by teachers was another complex aspect given the number of module components that exist and the large amount of information that they would begin to handle. 20 megabytes were established as the standard capacity for each component and some exceptions were made with module components of the Faculty of Art and Design where spaces of up to 100 megabytes were assigned, due to the needs of uploading graphic and audiovisual formats.

Regarding the choice of the registration method on the platform, Moodle offers three options: guest access, self-registration and manual registration. Guest access was not considered as it leaves open the possibility that people outside the institution could access published content without any type of control. The manual registration options were parameterized, an option through which teachers would be assigned in the third phase of the process. Students were enrolled using the self-registration process, a format that requires special parameterization through which each of the module components is assigned a key for its respective completion. The teacher was in charge of sending the registration keys to their students via email. The execution of phase 2 leaves the Moodle platform ready with the spaces created for each of the module components organized by program and by faculty, allowing easy search, management and administration of them.

STEP 3

It was defined by the process of **uploading students** and teachers to the institutional Moodle. Before the pandemic began, 225 students were registered, 8 users with the role of teacher and 2 administrators. The bulk upload of students was done through one of the utilities offered by Moodle known as student upload. This option allows users to be uploaded to Moodle in bulk using flat files in Excel, using data in the header with parameters such as **username, password, firstname, lastname and e-mail**. The bulk upload of users to Moodle is shown in Figure7.

Figure 7. *Flat file for bulk upload of users to the Moodle platform*

Source: own elaboration

A total of 15 files were processed and a total of 2,150 students were uploaded. One aspect that made the process more complex was that a significant number of students did not have an updated institutional email, an aspect that was a condition for uploading new users to the platform. This led to a process of purging the information that was available on the students and to the approval of the institutional email as the only means of communication. Teacher accounts were uploaded manually in some cases, and mass user upload was also used; 164 teachers were uploaded to the Moodle platform.
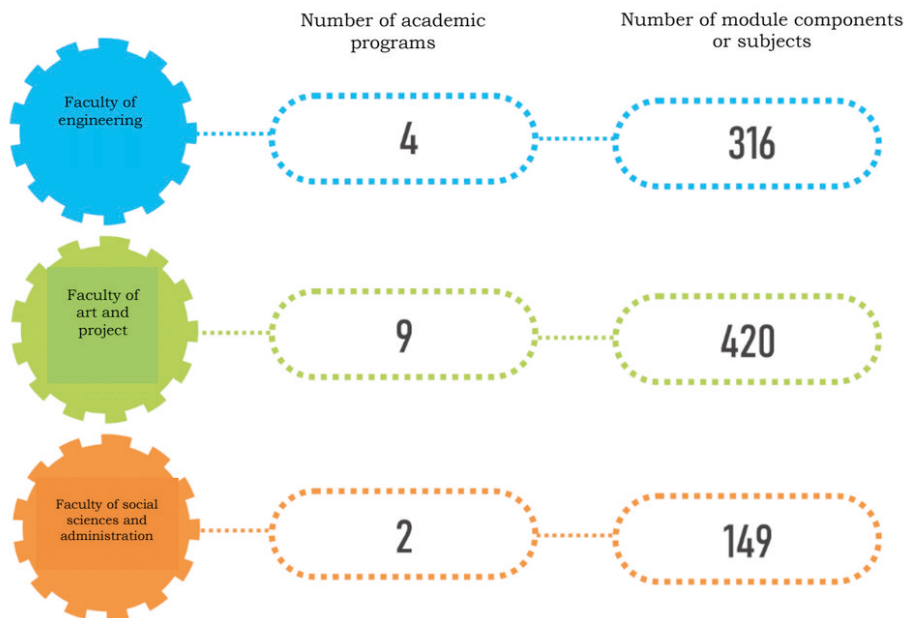
Figure 6. Faculties, Programs and Components created in Moodle

Source: own elaboration

RESULTS AND DISCUSSION

The proposed solution based on the use of technological components as mediators in education, within the ``*Colegio Mayor del Cauca*`` University Institution, allowed the training process and the communication dynamics between the different academic actors to continue, despite the serious restrictions generated by the pandemic. The validity of the proposal is analyzed with a survey applied to 38 teachers, a figure that corresponds to 22.09% of the total number of teachers at the institution. This technique was structured based on a questionnaire-type instrument, made up of 18 questions, the results obtained are presented below.

A total of 71.1% of the teachers surveyed express that they were not prepared to use technological mediations in their training processes, an aspect that is supported by the study by Mirete Ruiz, who states that the training processes for the appropriation and technological mediation in education are incipient, despite isolated attempts in higher and secondary education, for basic education

and first training processes, technological support has not yet been sufficiently explored. Training needs frame online education as an optional proposal that not everyone is interested in (Martin, 2010). This approach reduces the possibility of conducting studies that demonstrate and document this type of practice.

Another aspect that the instrument evaluated was oriented towards the perception that teachers had about the ease of virtualizing the content they teach. This is an aspect of vital importance in the study, since it is directly related to the validity and effectiveness of the proposal presented. The responses are varied, since they follow a nominal scale where 1 represents the absolute impossibility of virtualizing and 5 establishes that the content adapts perfectly to technological mediation. The results obtained are presented in Figure 8.

Not all content in higher education can be (Nieto, 2017) some topics related to arts and crafts do not fit this type of mediation, the percentage of teachers corresponding to 10.5% is related to the Faculty of Art and
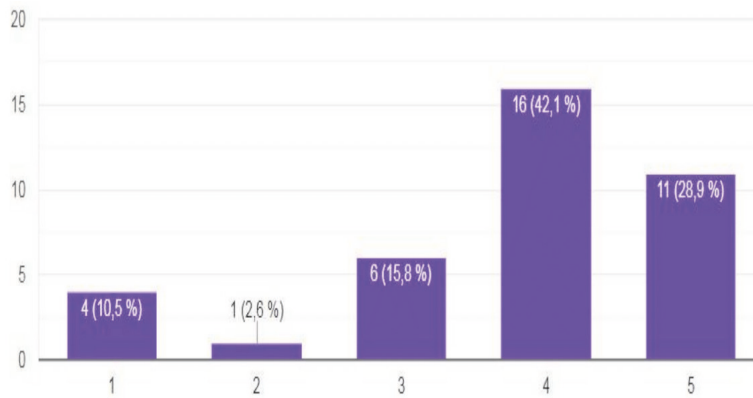
Figure 8. *Teachers' assessment of the adaptation of their content to virtuality*
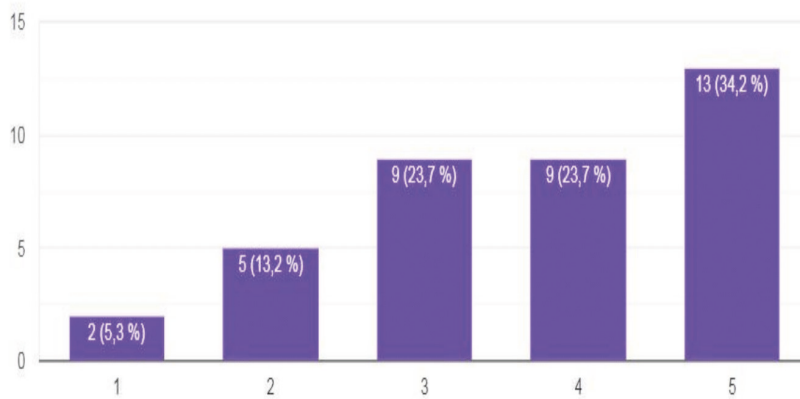
Source: own elaboration

Figure 10. *Percentage of teachers who think that virtual work can cause work stress and/or eye strain.*

Source: own elaboration

Design, where ICT-supported education is difficult to materialize.

Likewise, it is interesting to show with the application of the instrument that the time of dedication that a teacher must use to prepare a class in the traditional face-to-face model and the time that he/she uses in the preparation of a topic for virtuality. In this sense, 89.5% of teachers agree in affirming that the preparation time of a topic for technological mediation is greater.

This affirmation supports what is described by (Barbera & Badía, 2018) who states that the time of dedication by a teacher in virtuality requires more effort and dedication, especially when digitalization dynamics of content and face-to-face transformations to virtual ones are beginning. Figure 9 presents the data obtained.
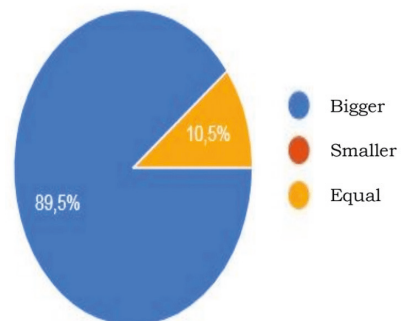

Figure 9. *Percentage of teachers who think that preparing virtual content takes more time than preparing a face-to-face class.*

Source: own elaboration

Sitting in front of a computer for long periods of time is an aspect that can affect the health of teachers. The technological mediation initiative involves greater interaction with digital devices, which leads to visual stress and possible incorrect posture. Although virtuality is a way to work from the comfort of home, lack of physical activity can cause long-term illnesses that harm health. The International Labor Organization ILO developed a practical guide (ILO, 2020) for teleworking during and after the COVID-19 pandemic. The purpose of this guide is to offer practical recommendations to achieve effective teleworking, which are applicable to a wide range of actors and sectors, not to which education is alien. In this sense, Figure 10 relates the feeling of teachers when asked if they believe that virtual work can contribute to the generation of stress and/or fatigue, 34.2% of respondents think that, to a high degree, a rating of 5, it can generate this type of anomaly.

One piece of information of particular interest is the daily dedication in hours that teachers dedicate to their work on the Moodle platform. In the training process described in phase 1 of this initiative, emphasis was placed on the continuous and constant review of the materials and activities proposed to the students. This is a key task of the virtual teacher (Ordoñez López & Bravo Buchely, 2020) and its fulfillment is directly related to the success of the proposal. Figure 11 presents the number of hours that teachers dedicate to work on the platform.
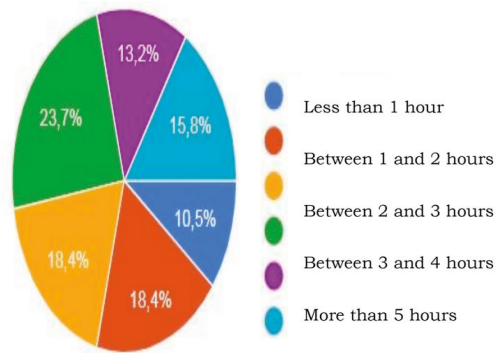

Figure 11. *Daily dedication in hours to work on the platform by teachers.*
Source: own elaboration

The dynamics of using technological tools to support training aspects has required teachers to use applications, tools and aids other than Moodle, defined as the main mediator in the proposed initiative. The teacher who links ICT in education must be characterized by his affinity with technological tools (Viñals, 2019), their use, management and appropriation are of vital importance. One question in the instrument was related to the possibility of showing, in addition to Moodle, what other tools teachers use in their pedagogical practice.

The figure 12 describes the teachers' response, where meet, which is part of the Google suite, is the tool used by 100% of the teachers surveyed.

Generating resources for virtuality is one of the most recommended practices when using technology in training processes (Viñals, 2019). More than an option, generating content for virtuality is almost an obligatory practice. Writing documents that support the topic shared on the platform, as well as creating presentations, audios or videos, becomes an activity highly valued by students. The teacher who links technology to education must make the leap to be seen on mass information transmission channels. It is not only about taking advantage of the available resources, but also collaborating in the generation of
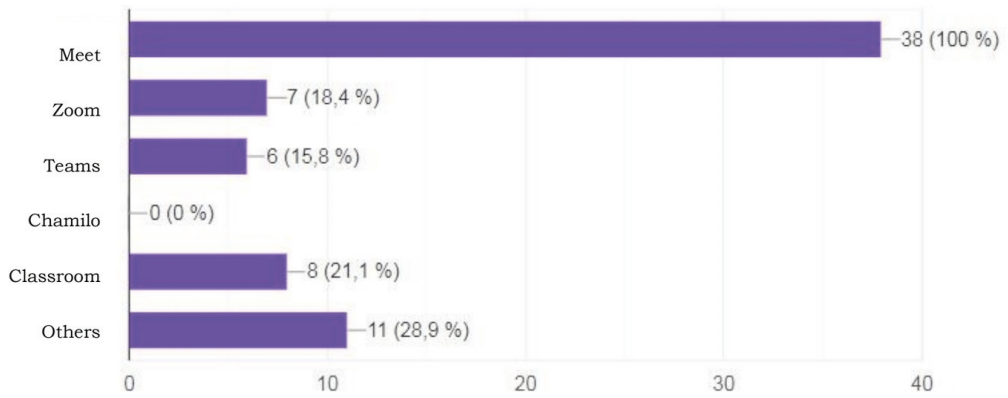
Figure 12. *Use of technological tools other than Moodle.*
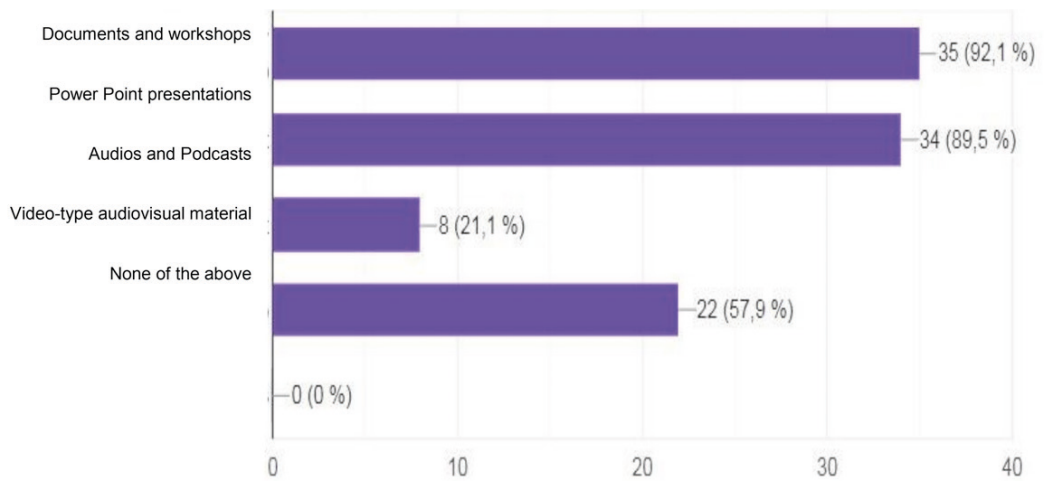
Source: own elaboration

Figure 13. *Type of resources generated by teachers.*
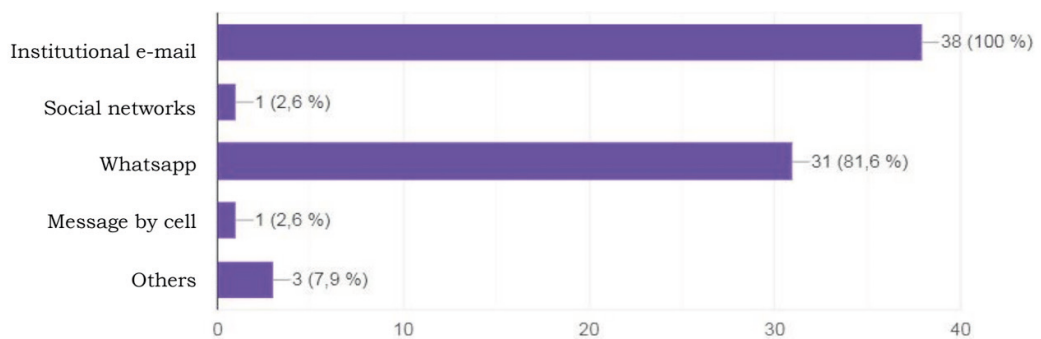
Source: own elaboration

Figure 14. *Communication channels used by teachers*

Source: own elaboration

these (Inciarte, 2016). The instrument applied to teachers shows that 92.1% of teachers generate document-type resources while, on a smaller scale, 21.1% generate audio or video-type material. The results obtained are shown in Figure 13.

One of the most important aspects when using technology to mediate training processes is the communication channels used (Santoveña, 2016). Beyond technology, communication plays the most important role in education. The selection of the channel, the identification of the actors involved and the protocol defined largely guarantee the success or failure of any initiative framed within this type of training (Sepúlveda, 2018). The instrument applied to teachers reveals the most commonly used mechanisms to establish communication with their students. Thus, institutional email, as evidenced by Figure 14, is the most widely accepted means, with 100% of teachers using this channel, while SMS text messages, via mobile devices, are the least used, with only 2.6% using them.

The purpose of any training process is for students to achieve the training objectives (Diaz Barriga, 2006), in short, for them to appropriate, assimilate, understand and use the shared content in the best way. In both traditional face-to-face education and technology-mediated education, this is the ultimate goal pursued by teachers (Monzo, 2014). The instrument applied had the question: Do you think that students achieve the proposed training objectives using ICT in education? Figure 15 presents the teachers' responses in a quantitative manner.
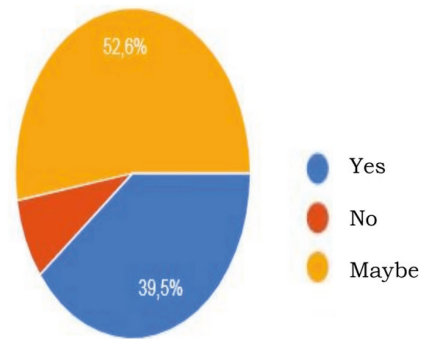

Figure 15. *Teachers' assessment of whether students achieve training objectives.*

Source: own elaboration

The previous question requires a qualitative expansion of the responses obtained. Below are some of the assessments described by the teachers.

> " ...We assume that both teachers and students must be responsible when assuming this learning modality, but I consider it a bit complicated to be able to affirm that the student is achieving these objectives..."

> " ...To a large extent, students achieve the objectives, however, those who do not achieve these objectives are more related to factors such as internet problems, computer equipment and students with cognitive problems..."

> " ...The knowledge and skills of the subject are taught with the same seriousness and depth as in person, but on other platforms and with other pedagogies and strategies..."

One of the most complex aspects of technology-mediated education is that related to assessment (Cano, 2015). In the training of the first phase, emphasis was placed on the innovation that teachers must generate in relation to this activity of the training process. The use of activities such as questionnaires, tasks, forums and workshops was suggested as some of the possibilities provided by Moodle (Ruiz, 2016). Its programming must be rigorous, especially in the questionnaires where some options must be defined that limit

the "collective assessment". A considerable percentage of teachers surveyed, 90.5%, use the platform to carry out assessment, Figure 16.
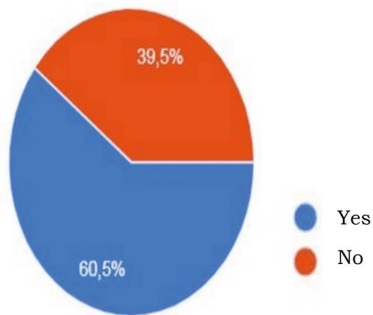

Figure 16. *Percentage of teachers using Moodle for assessment.*
Source: own elaboration

A percentage corresponding to 39.5% of teachers state that they do not use Moodle to carry out the evaluation process; some of the techniques described are described below.

"…Through assignments, workshop work, conceptual maps, summaries, research, readings, exercises according to the class being taught, presentations, essays, virtual models, delivery of architectural plans, feedback questions during class, review, videos, etc..."

"…The students' interest and disposition towards the learning process and the level of appropriation of the different contents when solving problems are evaluated..."

"Work and presentations..."

"…First of all, the assessment of the critical attitude that students develop with respect to the topics addressed in class..."

The application of the instrument to teachers also included a question regarding the possibility of implementing an alternation plan to return to face-to-face classes. The responses in terms of percentages are quite equivalent, 47.4% of teachers consider that an alternation plan must be implemented. Figure 17 shows the results obtained.
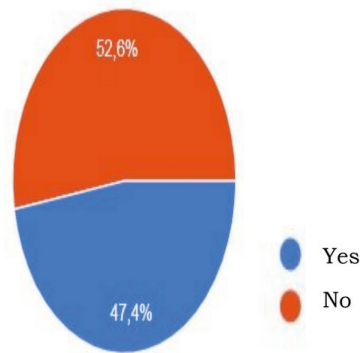

Figure 17. *Percentage of teachers who agree with the implementation of an alternation plan to return to in-person classes.*
Source: own elaboration

Figure 17 shows that 52.6% of teachers do not agree with the plan to return to face-to-face classes. Below are some of the reasons given.

"...As long as there is no self-care attitude, it is very difficult to return to classes, returning to face-to-face classes, the appearance of new peaks of contagion is at risk..."

"...I consider that the vaccination rates are very low and for the student population, zero..."

"...There are no conditions to return to the classrooms, as long as there is no mass vaccination plan, it is risking the health of the entire academic community...""...Check the no option because I consider that a return to face-to-face classes must be guaranteed by biosecurity measures..."

"...I consider that it would be a very high risk for the entire university community to propose an alternation plan in the situation in which we find ourselves, taking into account that in some courses there are more than 20 students, which would complicate social distancing within the classroom. On the other hand, for the teacher, leading a 3-hour class using a face mask entails risks..."

CONCLUSIONS

The health situation generated by the COVID-19 pandemic took all sectors worldwide by surprise and none of them were prepared to face the new scenario. Education, one of the hardest hit, has had to face the high impact of it. HEIs and educational institutions in general have been seriously affected, a very low percentage of them with experience in offering programs in virtual mode have been able to take advantage of the situation, considering not only the validity of the educational methodology supported by technology but also generating the reflection that virtual education is here to stay.

Facing the situation motivated educational institutions to look for new channels of communication and mediation with students. The training processes carried out in the vast majority, quickly and with a certain level of uncertainty on many occasions, did not generate the support that teachers could have required in terms of competence, to begin to use technological components in educational work. The isolated and low-impact experiences that some institutions could have developed did not meet the concerns and expectations of teachers.

The experience carried out by ``*Colegio Mayor del Cauca*`` University Institution was a support and a starting point to meet the great demand for requirements in the face of the new modality that, although it is not considered virtual education, has a high component of this type of training. Education from home, technology-supported education and similar terms were coined to give a name to the proposal, which in the end is supported by a high technological content.

Evaluation is one of the most complex aspects to put into practice when technological components are used in education. Evaluation is not the result of the understanding of a content, topic, theory or concept, evaluation is a process and requires multiple strategies to be implemented.

The return to face-to-face classes must obey compliance with the health conditions required for this purpose. It must be remembered that the vaccine does not guarantee immunity or transmission. European and Latin American countries such as Chile, leaders in the vaccination process, have had to implement new quarantines due to the appearance of outbreaks and new strains that are sometimes much more aggressive than the virus that causes them. Scenarios of self-care, sound judgment and compliance with minimum health standards must be taken into account if plans to return to in-person and normal educational activities are to proceed, if that normality is to be achieved again.

FUTURE JOBS

Initiatives to be developed include training processes that allow teachers to share content that is enjoyable for students, content that, due to its quality and way of being presented, competes with the large number of distractions that students find on the web. If the student's attention is captured by the teacher's presentation of a certain topic in a pleasant way, a great step will have been taken in this type of technology-mediated education. The dosage of information, the ability to self-learn and the level of responsibility on the part of the students must be fundamental elements in this type of dynamics.

As a differentiating element of many of the technology-mediated training initiatives implemented in educational institutions. The generation of own content creates an added value of absolute value, a characteristic element that can enhance the validity of the proposal. There are many tools that make the teacher's work easier and that can attract the student.

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