# Support Mechanisms Mediated by Technology: A Proposal from the Speech of Students*

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## ABSTRACT

The year 2020 will be marked by the pandemic of COVID-19 and by social detachment, more than that, it will be marked by a year in completely different education, in which all actors from basic to higher education had to readapt and relearn their teaching processes, learning, management and monitoring to maintain activities despite the rules of social isolation. This article aims to present proposals for support mechanisms mediated by technology, based on the voice of higher education students. For this, a qualitative and quantitative research was carried out with higher education students from Brazil and Colombia, the students participated in the research through an electronic questionnaire, and for this study, the variable "Digital Technologies" was considered for analysis. results and proposals for support mechanisms. As a result, we find that, even before the pandemic, students already cited the resources of digital technologies as an ally of the processes of teaching and learning, resources for experiencing and knowing the realities of students and professionals from other countries, increasing the interaction between teachers and students, as well as facilitating administrative processes. In this sense, we can conclude that the possibilities offered by digital technologies, mainly through the internet, can help teachers, managers and educational institutions to accompany students in their academic processes at this time and also in the future, when the students return presence activities.

## KEYWORDS

Higher education. Permanence. Educational interaction process. Support network. University student.

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# Mecanismos de Apoyo Mediados por la Tecnología: Una Propuesta a Partir de lo Que Dicen los Estudiantes

**RESUMEN**

El año 2020 estará marcado por la pandemia de COVID-19 y por el aislamiento social, además de eso por ser un año con una educación completamente diferente, en la que todos los actores de la educación básica a la superior tuvieron que readaptarse y reaprender sus procesos de enseñanza, aprendizaje, gestión y seguimiento para mantener las actividades a pesar de las reglas del aislamiento social. Este artículo tiene como objetivo presentar propuestas de mecanismos de apoyo mediados por la tecnología, basados en la voz de estudiantes de educación superior. Para ello, se realizó una investigación cualitativa y cuantitativa con estudiantes de educación superior de Brasil y Colombia, quienes participaron de la investigación, a través de un cuestionario electrónico. Para este estudio se consideró la variable "Tecnologías Digitales" para el análisis de los resultados y propuestas de mecanismos de apoyo, dicha investigación fue realizada con el estadístico descriptivo y el análisis de contenido. Como resultado, encontramos que, incluso antes de la pandemia, los estudiantes ya nombraban los recursos de las tecnologías digitales como aliado de los procesos de enseñanza y aprendizaje, recursos para experimentar y conocer las realidades de estudiantes y profesionales de otros países, aumentando la interacción entre docentes y estudiantes, así como para facilitar los procesos administrativos. En este sentido, podemos concluir que las posibilidades que ofrecen las tecnologías digitales, principalmente, por medio del internet, pueden ayudar a docentes, directivos e instituciones educativas a acompañar a los alumnos en sus procesos académicos en este momento y también en el futuro, cuando regresen las actividades presenciales.

**PALABRAS CLAVES**

Educación superior. Permanencia. Proceso de interacción educativa. Rede de apoyo. Estudiante universitario.

# Mecanismos de Apoio Mediados por Tecnologia: Uma Proposta a Partir do que Dizem os Estudantes

**RESUMO**

O ano de 2020 será marcado pela pandemia do COVID-19 e pelo distanciamento social, mais que isso, será marcado por um ano em educativo complemente distinto, no qual todos os atores da educação básica a superior, tiveram que readaptar e reaprender seus processos de ensinar, aprender, de gestão e acompanhamento para manter as atividades apesar das regras de isolamento social. O presente artigo tem por objetivo apresentar propostas para mecanismos de apoio mediados pela tecnologia, a partir da voz dos estudantes da educação superior. Para tal foi realizada uma pesquisa de cunho quali-quantitativo com estudantes de educação superior do Brasil e da Colômbia, os estudantes participaram da pesquisa por meio de questionário eletrônico, sendo que, para este estudo, foi considerada a variável “Tecnologias Digitais” para análise dos resultados e propostas de mecanismos de apoio, sendo a análise realizada por meio da estatística descritiva e análise de conteúdo. Como resultados encontramos que, mesmo antes da pandemia, os estudantes já citavam os recursos das tecnologias digitais como aliada dos processos de ensinar e aprender, recursos para vivenciar e conhecer realidades de estudantes e profissionais de outros países, aumentar a interação entre docentes e estudantes, bem como facilitar processos administrativos. Nesse sentido, podemos concluir que as possibilidades oferecidas pelas tecnologias digitais, principalmente por meio da internet, podem auxiliar a docentes, gestores e instituições educativas a acompanhar os estudantes em seus processos acadêmicos neste momento e também no futuro, quando do retorno das atividades presenciais.

**PALAVRAS-CHAVE**

Educação superior. Permanência. Pedagogia da interatividade virtual. Rede de apoio. Estudante universitário.

## 1. Introduction and Theoretical Framework

Thinking about support mechanisms implies reflecting on student permanence, understanding it as an important component to achieve the central objective of educational institutions, which is to educate people. In addition, at the present time it becomes relevant worldwide, since universities and in general all educational institutions, primary, baccalaureate, and higher education are concerned about student permanence motivated, of course, by all the issues that this pandemic entails with respect to it.

Boaventura de Sousa Santos says it well, we are living the cruel pedagogy of the virus, because in a very difficult and painful way, we are forced to leave the comfort in which we looked at technologies at a distance, now we are forced to use them and relearn to live and organize ourselves as a society. For Santos (2020a), the pandemic is a pedagogy because it teaches many things and forces us to reflect on what is happening and understand that what we have experienced in the recent past is no longer useful.

Tinto (2012) throughout its development on the subject of student abandonment, since 1997, has proposed strategies to promote permanence and this year has proposed the creation of communities of accompaniment to students, emphasizing how all levels of the institution are part of the process of training students, and that institutions have to go beyond the transmission of knowledge reaching the formation of citizens. What the pandemic does, is to face all the questions that we had been asking about the use of technology, and now those years that we thought we were taking to transition to the use of digital technologies were overcame us, so the first question we have to ask ourselves at this time is: How are we going to incorporate those information and communication technologies in our teaching and learning processes?; But also how are we going to make those students that we have on the other side of the screen motivated by what the teachers are transmitting, who want to know it? These questions even lead us to think about our own knowledge.

### *1.1. Student Persistence*

It is necessary then, in this time of pandemic, to investigate the factors that influence permanence, and in this particular case to reflect on what is the best way to use technology to promote student learning, mainly because institutions at all educational levels, worldwide, are using an emergency remote education mediated by digital technologies. At this time when we are all immersed in virtuality, it is interesting to also look at what students are saying to better comprehensive their support needs.

According to Tinto (1987; 2012; 2017; 2020), when addressing permanence, from institutions, managers and teachers must understand that it is necessary to go beyond the enrolment and registration of students, although this is the first step for the existence of Higher Education Institutions (HEIs), and constitutes the initial student-IES link, permanence has to do with the mission of educational institutions, which is the education of individuals beyond simply their schooling.

In the world, at this time, universities and colleges are very concerned about identifying how to promote the permanence of their students, aware that they must go beyond the economic factor, of which different studies have shown their importance, but there are other factors such as the individual, institutional, that affect that the student remains in the institution, and at this time they take on special relevance. As already stated, talking about permanence is a challenge since it is a multifactorial phenomenon in which there is not a single point of attention, there are several aspects and it is the directors of the institutions who are responsible for looking at the set of points and proposing intervention alternatives. The challenge is, first to understand the context and then understand that teachers, managers and students are different, each one is one and understanding this is the starting point.

In addition, there is no model that can be applied to all universities and all problems, it is necessary to adapt the model for each IES, precisely because of the different variations present in each context. For each educational institution, issues such as its characteristics in the level of training it provides, location in an urban or rural area and its status as public or private must be taken into account; they are very great challenges and we must be very attentive to recognize the characteristics as an institution and with respect to the capacities in the offer of diversity/educational inclusion. That is, who are the students, the teachers, the managers, the technicians, that is, the entire academic community as it is constituted and how it behaves.

The permanence in Higher Education must be planned from the point of view of the active actors in that scenario, that is, students, teachers, managers and all employees, since, the students are the target audience of Higher Education, the teachers the "face" of the institution together with the students and the directors and other employees give support so that the actions/interactions occur. Thus, it is necessary to consider that, in order to develop permanence in Higher Education, these actors, managers/employees, teachers and students, must work together, involved in a process of cooperation in order to develop a quality and equitable education for all. (SANTOS, 2020b)

**Figure 1.** Gear of the actors of Higher Education


Source: adapted from Santos (2020)

The gear, presented in Figure 1, must be part of a culture that needs to be worked on in the subjects at all levels it is important that everyone has this awareness and that from the managers, from the management of the institution, spaces are generated in which all people, that is, all groups, feel part of this process and are aware of the importance of their role in permanence, this is why this model is integrationist, if a part of this gear or groups of actors does not articulate or does not realize their commitment, blocks others, there is necessarily a synergy at work. So, this sense of belonging needs to be developed in all the actors of the educational institution by their behaviour, by their importance and by their co-responsibility, because the work of the University depends on everyone. Finally, it's about creating a culture of shared responsibility.

This is proposed by the Integrationist Model of Santos (2020b) since all subjects are part of the same gear, if a part does not move, nothing moves. In addition, to put into practice the actions for the permanence of students, the Model contemplates the academic approach as a central axis within educational institutions, preserving as Tinto proposes the importance of the generation of community from adaptation activities.

**Figure 2.** Integrationist model of permanence


Source: adapted from Santos (2020)

This model, presented in Figure 2, is structured to be worked on in higher education, presents two extremes that develop the activities, one is the meetings that are held between the internal academic community (IES) and the other those carried out by the research communities. These variables are thus arranged to cover different contexts, the internal meetings are thought and contributed in the local context considering the internal variables, and then, together with the research communities, know the actions that are applied at a more global level that can serve to adapt metrics and actions in the institution.

In addition to these variables of entry and exit at the institutional level, the model proposes that actions be planned considering the variables: Link with basic education - make the process of moving from secondary education to higher education more fluid - Educational Inclusion - people with disabilities, high skills and giftedness, likewise gender inclusion is contemplated, ethnic inclusion, socioeconomic inclusion - Mentoring and Learning Support Laboratories, for example, students who are studying more advanced semesters can accompany the students of the initial semesters in their adaptation to university life - Internationalization - carry out Internationalization activities from the University such as webinars, work with foreign literature, participate in the massive open online courses and put it as part of the program curriculum, presenting foreign guests - Digital Technologies - as a means to carry out interaction with students and energize teaching practice and educational processes - and Active Methodologies - where the student is more active in the process and can exchange knowledge at times with teachers, that is, the student can also teach teachers - all aimed at achieving student permanence in higher education. On the other hand, and integrated to the above, to be part of research communities in which actions are shared and rethink what is necessary to promote the academic success of students, given that these communities are a space in which different visions are presented, discussed and built for the same topic generating new possibilities for the promotion of student permanence.

### *1.2. Digital Technology*

This study focused on the variable "Digital Technologies" which, especially at this time, helps the different institutions and contexts by providing strategies that allow the development of student care in a more efficient way. It is important to consider the difference in access to technologies for different urban and rural contexts, and also in institutions depending on whether they are public or private.

This year in some countries the institutions that are part of the private network, needed days or weeks to adjust and adapt the activities that would allow to carry out the emergency remote care, on the contrary, in the public network, the institutions and the secretariats of education took months to organize; for example, in Brazil, for the vast majority of public universities, this reorganization took the entire first semester of 2020. This is a reality not only for Brazilian institutions, according to UNESCO (2020b) this situation occurs in areas of the world that struggle with limited resources and significant shortage of qualified teachers.

In order respect, the emergency remote attention highlighted the gaps in access to digital technology and internet resources, and social inequality, which in many nations does not allow all students to have access to education in the virtual modality. (ARAUJO *et al*., 2020). With social isolation, the alternative for the continuity of activities was the use of the resources of Digital Information and Communication Technologies (TDIC) and the Internet, here it is worth mentioning that, only making use of the TDIC and being physically distant does not configure Distance Education (EaD), what is being done is a Remote Emergency Care (ARE) that does not have the same planning and organization as the EaD. Well, "the EaD implies a previous planning, consider the profile of the student and teacher, in addition to developing teaching and learning strategies in the medium and long term" (ARRUDA, 2020, p. 183).

It is also important to note that technology is being used as a viable alternative, even with limited access, for the continuity of academic and school activities, but that, on its own, it will not develop and execute the teaching and learning processes, so, technology cannot be understood and used as an end, since it is only a tool, a means to promote the development of quality education.

The sudden need for social isolation and the use of technologies as a means of not stopping education, shows that the relationship between education, technology and society is of paramount importance for the development of the individual as a whole (PÉREZ GÓMEZ, 2015). Technology is increasingly present and necessary in the daily life of everyone worldwide, but it is necessary to reflect deeply on inequality in access to create and execute the necessary actions to make equity in access to technology and education a reality.

In fact, the pandemic has brought to light what was long ago being considered, how to incorporate TDIC in teaching and learning processes? In addition to that, how to approach the contents to enhance them by developing curiosity and the desire for knowledge through technology? What skills and competencies are needed to have a mindfulness of students in virtuality?

According to the OECD (2016), in the knowledge society the role of the university lies in providing students with experiences that also promote, in addition to technical skills in a given area, personal and social development, the development of soft skills and training and professional processes. We do know that the processes of attention have cycles, how do we then make sure that there is a full attention of our students in virtuality? Alternating periods of synchronous time with other asynchronous ones, making active pauses, which favour learning. A new question arises, do we have to ask them to open the camera or leave them with the camera off? and many other issues that seemed simple and we have been answering as they arise. Maybe it was easier in the classrooms, in the cafeterias, in the sports and cultural spaces offered by the institutions and we with our pedagogical processes, now we have a giant challenge and that is how are we going to develop soft skills that allow them to interact in virtuality and then when returning to face-to-face?

According to Róldan (2020, p. 33), when mentioning a post-pandemic context, he points out that "all this will further modify the way economies operate, among other things because the key will be the innovative ideas put into value". Although educational institutions already had to reinvent themselves on behalf of global markets, the pandemic has accelerated the changes and needs of training for the development of competences and skills that promote educational innovation and, consequently, the training of innovative professionals who will have problems that are not yet known, and they need to be thought of with creative ideas and solutions generated by these new professionals that universities are training.

For this, according to Róldan (2020, p. 35), education will be "multicultural, acquired at all times and in any place, inside or outside the classroom, in person and at a distance, and tailored to the particularities and interests of the individual."

> This remarkable expansion can only be fully exploited if the higher education provided is able to adapt to the demands of a more sophisticated and complex society and economy, in which the quality, institutional reputation, flexibility, adaptation and excellence of academic programmes, among other things, are of such relevance as to enable graduates to integrate into a labour market that requires high qualifications and the acquisition of transversal competences, such as mastery of the digital universe or the capacity for innovation and adaptation to these innovations. That is the crucial challenge that universities will have to face, thinking differently and making bold decisions, if they want to be competitive in the twenty-first century. (RÓLDAN, 2020, p. 38)

In addition, if students are going to graduate at this time when most of the work processes are carried out behind a screen and it is not clear how long that remoteness and closeness as we want to name it in the pandemic will continue, the institutions have some really interesting challenges and the look must be put on the positive space of the learning

that can give us. In this sense, this article give thought to present some proposals for support mechanisms mediated by technology based on what students say that allow educational institutions to establish their own strategies for the accompaniment of their students.

## 2. Methodology

The present study is characterized as mixed, qualitative and quantitative, in order to know and better understand the variables related to student permanence in the face of the challenges of the emerging context of higher education from the perspective of students. For data collection, the research instrument used was the questionnaire, which "is a data collection instrument, consisting of an orderly series of questions, which must be answered in writing and without the presence of the researcher." (MARCONI and LAKATOS, 2011, p. 88). The questionnaire, when answering a hypothetical deductive method, presupposes the existence of a set of variables known a priori that translated into indicators can measure their distribution in a given population.

The research instrument went through expert analysis, which did the validation of construct and content. Thus, the questionnaire has multiple choice questions and opinion questions, which allows to deepen the criteria of the participants on the proposed topic. It seeks to have the complementarity of qualitative and quantitative research, and vice versa. For this purpose, we use the data triangulation method, as proposed by Flick (2009) when he says that both approaches support each other and can present a more general picture about the problem studied.

The questionnaires, with open and closed questions, were organized in the Qualtrics software which was used for the distribution and collection of the data. Having the focus on the analysis of the variable "Digital Technologies" and its unfolding for the achievement of the proposed objective.

Participants are undergraduate students of different Academic Programs, selected by invitation and participate after acceptance of the Free and Informed Consent, provided to all guests. The research was approved by the Research Ethics Council under registration no. CAAE: 19886619.0.0000.0029.

The questionnaire consists of four blocks, the first contains the format of free and informed consent, the second the characterization questions, the third investigates the factors for permanence and the fourth block contains the open questions that address aspects of internationalization, global citizenship and digital technologies in educational processes. For the sample calculation, a confidence interval of 95% and a margin of error of 5% were used.

Quantitative analysis of the data was performed using descriptive statistical analysis with the support of the SPSS software. For the qualitative analysis of the open questions, content analysis was used, which, according to Bardin (2010), in a process carried out in three stages: pre-analysis, exploration of the material and analysis and interpretation of the results,

with the support of the NVivo software, categorization, search by recurrent terms and inferences were carried out that supported the proposals presented in session 6, on technology-mediated support mechanisms.

## 3. Analysis and Discussion of Results

The study was carried out between Brazil and Colombia, between the months of October 2019 to March 2020, the components worked on were, teaching practice, student dedication, quality of the program, institutional management, and the variables internationalization, global citizenship and digital technologies, which are transversal to the study. 3,882 students from 6 institutions participated, 2 Brazilian and 4 Colombian, 733 of the students are Brazilian and 3,179 Colombian. The distribution of students and the percentage of coverage by semester are presented in Table 1.

**Table 1.** Students by semester

| Semester | Porcentage |
|---|---|
| 1° - 2° | 34,6 |
| 3° - 4° | 19,6 |
| 5° - 6° | 18,8 |
| 7° - 8° | 11,3 |
| 9° - 10° | 15,7 |
| **Total** | 100 |

Source: Authors, field research.

The application of the survey was segmented according to the semesters, considering what the different authors propose about how the student dropout rates differ in the cohorts of the semesters, presenting in the first and second semester the highest dropout rate. Considering the distribution of the general sample, we have a good representativeness between the semesters, given that in the first two semesters the number of students is higher.

### *3.1 The Digital Technologies Variable*

For this work we focused on the variable of digital technologies, exactly because we understand that at this moment there is something without antecedents that would allow us to imagine what was going to happen and how to respond. It is happening in all institutions and all contexts, with this pandemic, the abrupt incursion into the use of digital technologies to do mediation and be able to reach students, without the physical presence, but seeking to be present in some way to maintain the teacher-student link and with the educational institution.

In this sense, the review of this variable allows us to know what the students say, what the voice of the student is, in order to propose strategies that contribute to the attention of the students and establish the mechanisms of support and academic follow-up in these times of pandemic and in the future. Table 2 presents the percentage of use of Digital Technologies resources and allows us to know which of these resources are most used in academic and class activities.

**Table 2.** Digital Technologies in academic activities

| Instruments | % |
|---|---|
| Virtual Learning Environment - VLE | **61,4** |
| Electronic mail / email | **88,3** |
| Foros | 31,7 |
| Chat | 35,1 |
| Activities online | 45,8 |
| Virtual Learning Object - VLO | 23 |
| Simulators y Games | 17,1 |
| Mobile applications | **49,3** |
| Social networks | 46,2 |
| Nothing | 2,7 |

Source: Authors, field research.

Of the tools mentioned, with 88% email is the tool that students indicate as the most used technology in academic activities, and may be a very important factor in these moments that we are living, with remote attention the difficulty that teachers have to adapt to the management of technologies was evident, using email is very simple, it is an asynchronous communication, which does not require much interactivity or planning. This reality can be hindering the immediate passage to virtuality, because interacting in virtuality is very different from simply sending an email, it requires a very well-organized planning, even technological resources aligned with the class contents, so we can infer that by doing practically only the use of email makes it difficult to adapt to virtual activities and interactions.

The second most used tool is the Virtual Learning Environment (EVA), 61.4%, which is important given that the EVA allows to dynamize the teaching process through different resources, but, in the open questions of the survey, many of the student's state that the EVA is used only as a repository of content and not to interact with teachers or do collaborative activities with their peers. That is, there were no activities that allowed interaction between all, that shows us that most of their teachers in their practices, make little

use of, for example, video applications, games or simulators, virtual learning objects, social networks or cell phone applications, because of these options, all have a lower percentage of use of 50%. In addition, 2,7% of students responded that teachers do not make use of any type of technology. That is, there are still some courses that do not use technology resources for classes or to communicate with students.

For Coates (2007), students who have a collaborative style tend to privilege the social aspects of university life and work, to the detriment of purely cognitive or individualistic interaction positions. Such students have a level of commitment that goes beyond the individual, their attitude allows to involve and support other students in academic integration. So, to develop learning communities in the classroom, digital technologies aligned with the methodologies of teachers can be a powerful strategy for bringing students closer to the university context and getting involved in studies and their training processes.

When we look at the tools, from the point of view of institutional management - Table 3 - satisfaction with the management about the resources of available digital technologies, such as laboratories, virtual learning environment, library, etc., is quite high, where 73,6% are satisfied or very satisfied with the available resources.

**Table 3.** Satisfaction with available resources

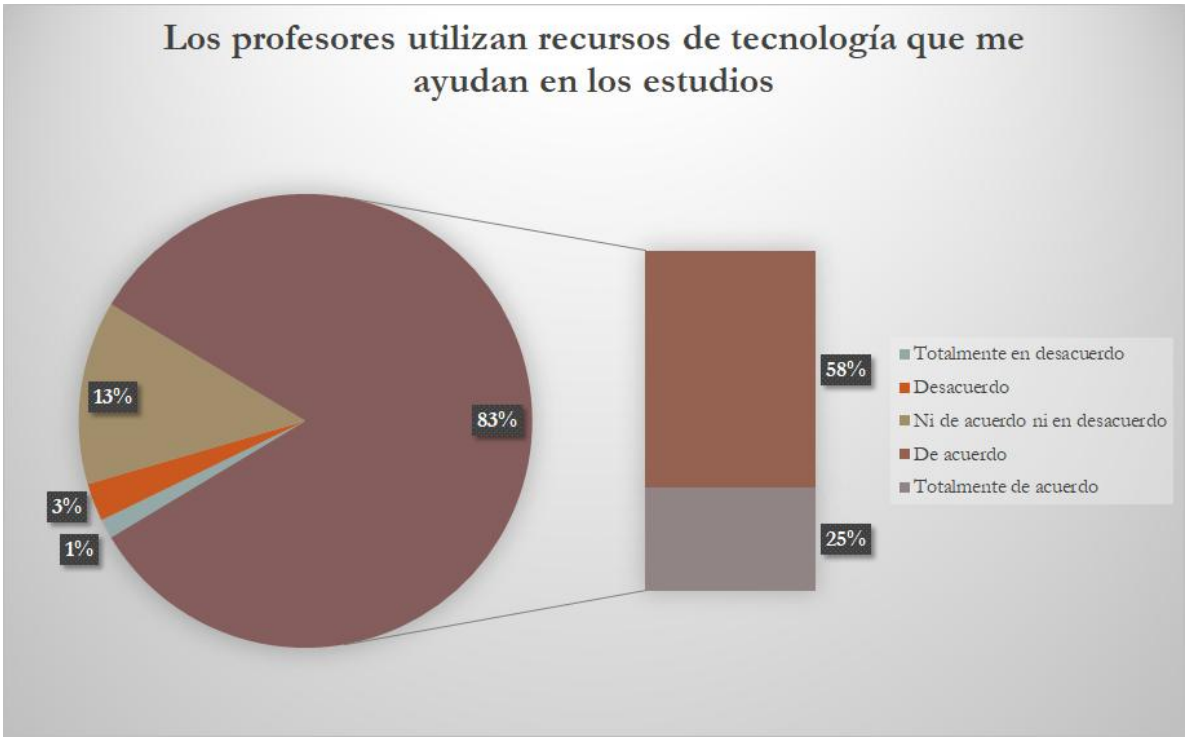
| Valuation | % |
|---|---|
| Very unsatisfied | 3 |
| Dissatisfied | 5,9 |
| Partially satisfied | 17,4 |
| Satisfied | 51,1 |
| Very satisfied | 22,5 |
| **Total** | **100** |

Source: Authors, field research.

Astin (1991; 2012) highlights that permanence is intimately linked to students' motivation to achieve their academic goals and purposes. That is, for the author, the positive experience of the involvement of students in academic activities has to do with the satisfaction in relation to living in the educational institution and with the offer of activities that go beyond the purely curricular, since diversified activities and resources can motivate the feeling of belonging of students to the IES.

The feeling of belonging is important for the development of students and their permanence in the studies, being the teacher an important articulator of this feeling in their daily practice, since the teachers have a closer contact with the students and make the interface between these actors and the institution. In the same way, the use of technology by them impacts on that sense of belonging, the answers to the question about the use of technology in teaching practice and its relationship with the study, are presented in Chart 1.

**Chart 1.** Help of digital technologies in studies




Source: Authors, field research.

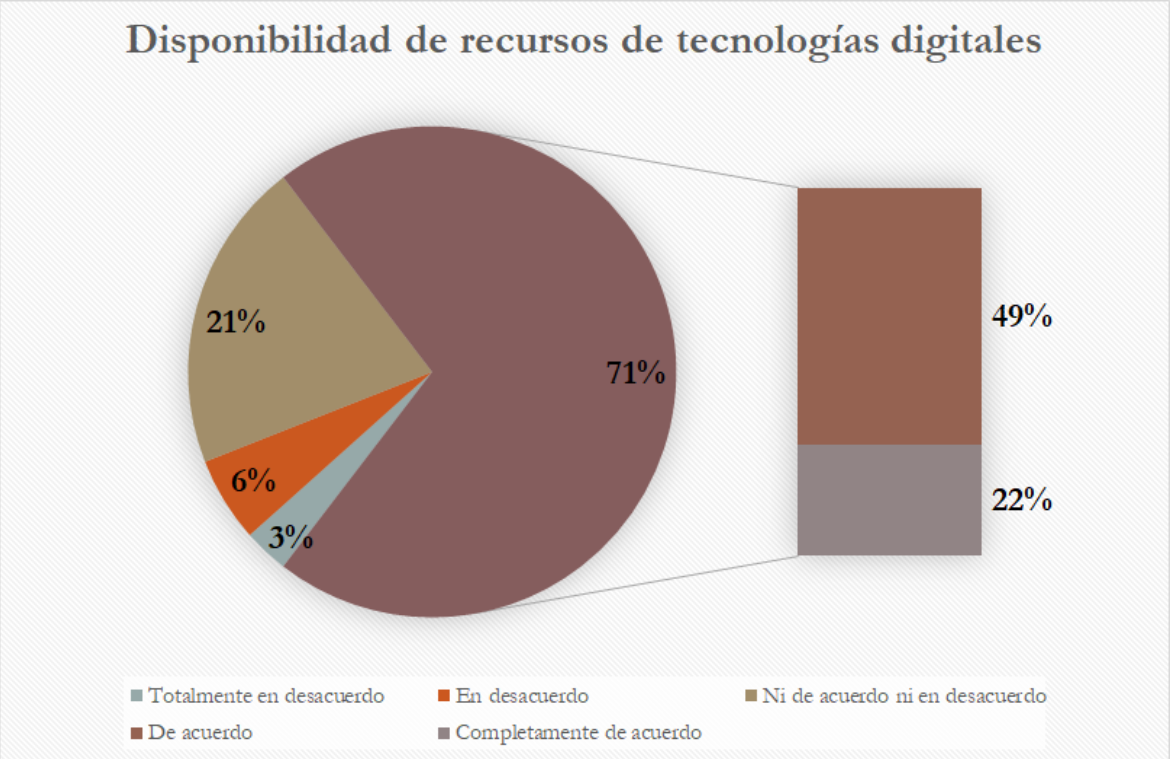
To the question, about whether they consider that the use of technology resources helps them in studies the percentage rises to 83%, it can be concluded that technologies can help in the teaching/learning process, that is, students in their studies, but we must bear in mind that, to use technology, the teacher of the institution has to be very clear about the objectives for which he uses it. It has to have a previous planning, it is not the use by use, it must be clear why each of the resources are being used.

So, the use of digital technologies cannot be limited to the projection of content or information, that would only be to change the board for the computer or cell phone, without promoting interactivity and the competences of autonomy, criticality or research, for example. Planning technology-mediated classes is allowing students to access and create different content, as well as learning to constructively use resources and the internet for their professional training.

In addition, because this is an atypical situation, it can generate situations of stress and anguish for the development of classes by not having physical contact between students (ARAUJO *et al*., 2020). So, promoting activities that strengthen and promote interaction among all is a way to alleviate non-presence and allows the teacher to be attentive to the processes and behaviours of students.

Decrease dropout, this is the objective of our study and when asking about the infrastructure of technology resources and if that motivates them to stay, 71% agree or completely agree that this motivates them to stay in the institution, that is, students are telling us that this interaction and this dynamic with digital technologies is important to continue in the University and remain in the studies. Chart 2.

**Chart 2.** Digital technologies factor for permanence




Source: Authors, field research.

When we talk about the use of technology by teachers at the present time, we have an 83% positive response to the promotion of permanence and contrasted with the availability where 71% agree or very or totally agree that it helps them in their studies, we can infer the relevance it has for students in the educational process.

### *3.2 Student Voices*

To understand the supports that can be useful to generate student monitoring, it is essential to know what these actors think about the use of digital technologies in classes and other academic processes, including what they think about the importance of TDs for their permanence at the University. So, with the support of the NVivo software, the answers to the open questions were coded under the content analysis methodology. The categorization was given under the factors of the study and emerging categories, originated from the analysis.

The a priori categories are Management, Practices and Dedication, and the emerging ones are Feelings and Experiences. The categories with the most presence in the comments of the research participating students were: Practices and Experiences. In Diagram 1 we present the proportion of responses by categories, as well as an example of the responses of the subjects.

**Diagram 1.** Analysis Categories


Source: Authors, field research.

Students say that digital technologies facilitate the understanding of content, the realization of activities and allow adapting to the current demands of the labour market. They also take into account that there are different levels of access, so the gaps are not only social, we also have gaps at the digital level and many of the students report the difficulties of access to equipment and the internet, but of those who have access, they present difficulties in the management of technologies or how to use them to optimize studies.

After a year they have not reached the levels of knowledge at the level of digital technologies that allow them to navigate in a fluid way through learning, but it also tells us that they are concerned about how they are going to adapt to the current demands of the market, to this question that was asked to a student, How is this contributing to what is coming, What is going to happen now after the pandemic, in the workplace? this student replied, "They are not training us for those market demands." (Student 88). On the other hand, one of the participants answered, "Yes, digital technologies facilitate the understanding of content, facilitate the realization of activities (taking into account that my colleagues have digital knowledge) and adapt to the current demands of the labour market." (Student 125)

Another student tells us, there are teachers who are slow to respond to messages. How do you study if at that moment you are trying to solve a concern regarding some topic or evaluative activity? This generates that the student begins to be bad and becomes

demotivated, if he does not find a good accompaniment as this other student tells us, that technology can help, but it is if the student feels alone in the process, if he feels abandoned, he already loses that characteristic and technology goes against the motivation and the learning process. About that they tell us that "there are teachers who delay in responding to messages, where one as a student, is trying to solve a concern regarding some topic or evaluative activity, this generates that the student begins to be discouraged". (Student 41)

Other students tell us that technology is important because it teaches students and allows teachers to connect with global ideas to apply to local realities. Internationalization, as proposed in the Integrationist Model of Santos (2020b), does not occur only by leaving the country living it in an ethnographic way. Knowing the culture can be done within the institution, with visits from foreign teachers which this year is done in virtual mode, with the courses we give them in other languages, but a student identified something interesting and is how the teacher can enhance the use of these technologies to know what is being done in that subject in other parts of the planet and bring it to class.

Regarding the practice of teachers, students comment on the insertion of TDs in the classroom and point out why they consider technology important in teaching and learning processes. Student 390 relates that it is important "because it teaches its students and also allows the same teacher to connect with global ideas to apply it to local realities", while "technology can help, but also hinder, when the student feels alone during his academic career". (Student 587)

When pointing out the technological resources used for pedagogical purposes, it is necessary to know the type or how pedagogical mediation will be carried out with a view to developing the teaching and learning process. On this, Santos (2020b, p. 218) emphasizes the "need to use technology as an ally of teaching and learning processes and as a way to bring students closer to the educational context and their dedication in the classroom", as Student 367 points out when saying "I consider that yes, since they are better alternatives to reach and capture the attention of young people, and allow us to have a better approach in the academic process". (Student 367)

But they also make the class more dynamic and it is not the technology per se that teachers offer with the mediation of technology, that is, it is how they use it and put it at the service of the teaching-learning process that makes the use of technology meaningful. Another interesting point to analyse is the perception that students have about the logistics of travel, which includes costs, to the university. On that one of the participants says that technology is important because for some activities "it avoids displacement by students and the class becomes more dynamic." (Student 2178)

Different theorists propose that the students who arrive at the university are those who were born immersed in the connected world, they are no longer the same for whom our educational system was created. (Aretio, 2021; Veen and Vrakking, 2009; Prensky, 2012) And also students perceive that, for example, Student 74 comments on the implementation of TDs in academic activities, "of course we do because we are young people who develop all

the time with technology and we like that teacher also implement it". But these years´ experiences has allowed us to know another reality, as it was raised before, the existing gaps in access to technology and the use that had been taking place before the pandemic, mean that in the classrooms there are still digital illiterates, students skilled in social networks, but little suitable to learn with technological mediation.

The word cloud presented in Figure 3, where the size of each word indicates its frequency, admitted as the relevance of a given topic, allows to visualize the nuclei of meanings that students give to the importance of digital technologies for academic processes and their permanence in the university. Thus, the emphasis on the words Learning, Classes, Help and Facilitation is evident, in addition to the words Technology and Students, which corroborates the inferences that are made from the analysis and allows to know the voices of the students when they talk about the use of technologies.

**Figure 3.** Student voices


Source: Authors, field research.

Knowing the profile of the student and the teacher, gives clarity about their potentialities and their needs with which the managers of the management in the institution can provide teaching/learning strategies and training moments, even in the medium and long term, to ensure that teachers can adapt their classes to the use of technologies, now in this moment of virtuality, and then in face-to-face.

It is also important that students understand this process and glimpse that the use of technologies is done to enhance their learning, it is not a game they should be aware of what is behind the use of technology and its use as a tool. As a means to potentiate the development of a quality education on its own, it will not do anything, then it is necessary to train teachers for the management of technology and for the planning of the use of technology, that is very important because it allows to develop the support mechanisms for students.

As Machado, Santos and Costa (2020, p. 707) reinforce, "digital technologies can enhance group work and develop communication, interaction, reflection and critical thinking". On this occasion, by looking at technology-mediated activities, it is possible to develop skills in our students and create a learning community.

## 4. Technology-Mediated Support Mechanisms

This session is a proposal based on what the students say, who are the ones who really know what the pending issues are to improve the teaching and learning process. At the present time this issue of technology becomes relevant because we are, worldwide, thinking about ourselves, in the entire education system, how we are going to handle student permanence.

In this sense, digital technologies are a real possibility that allows students to be brought closer together and trained in the autonomy and development of skills necessary for the training of critical and qualified professionals to work in a dynamic and competitive current labour market. To achieve that, it is essential to know the students to support them in their training process, Colon (2017) talks about the student's trade when naming the contemporary university student, as a trade this is an activity that must be learned by the students, so, it is the role of the university to prepare young people for it.

In other words, it is necessary to train students to discover the routines, rules, evidences and codes of the university, as well as to understand the implicit activities they have, and that they will not be asked, for example, the intellectual work that is indispensable for academic success. Bain (2014) when conceptualizing a student points out that the student can take control of his own education by looking for additional readings, participating in academic life, the curriculum and its development as experiences and lessons for his personal and professional life, but when the student is not prepared for that, it is the role of the IES to provide spaces for the student to know his role and his co-responsibility in his educational process.

In Square 1 we present some activities that can be developed from the institutions to support the students, but also others that the students themselves can adopt in the studies, in individual or group modality. In Table 1 we present some activities that can be developed from the institutions to support the students, but also others that the students themselves can adopt in the studies, in individual or group modality.

**Square 1.** Technology-mediated support mechanisms

| Activity | Tool | Suggestion | Organizer |
|---|---|---|---|
| **Perform access and presence monitoring in the LMS.** | Online surveys (Google Forms, SurveyMonkey, Qualtrics, etc) | Evaluate the quality of educational processes and classes.<br><br>Distribution by subjects about the methodology and class contents. Opinion on academic processes. | Managers |
| **MONITORING** | Moodle charts | Accompany the face-to-face activities of the students through the weekly monitoring of the graphs of access to Moodle or the LMS that the institution has available.<br><br>Realizar el monitoreo de acceso y presencia en el LMS. | Managers |
| **PSYCHOLOGICAL SUPPORT** | Zoom, Meet, Teams, WhatsApp, Phone | Offer first contact help to students.<br><br>Group of experts (professionals, teachers) who have assigned schedules available by call or videoconference. | Managers<br>Psychologists |
| **GROUP PSYCHOLOGICAL SUPPORT** | Grupos de Facebook, Zoom, Meet, Teams | Offer group psychological support and provide support tools so students can support each other. | Therapeutic Groups |
| **TUTORING** | Zoom, Meet, Teams, Trello | Virtual meeting for accompaniment.<br><br>Collaborative management of projects and activities that can be carried out by several people involved.<br><br>Create lists of activities, composed of cards, to edit and move within task tables and status. | Managers |
| **MENTORIES** | Zoom, Meet, Teams, Trello | Virtual meeting for accompaniment | Professor and advanced semester students |
| **GET INFORMED** | Podcast (Free Sound, Anchor, Spotify, Google Podcasts, Deezer, others) | Provide information about university processes, regulations and news.<br><br>Create a podcast channel where learners can access and receive update reports.<br><br>For recordings, plan a script with the theme, the audience, content. In the script consider an initial vignette, the presentation of the announcers, the date of publication and the theme of the podcast of the day, in addition to the content. | Managers<br>Profesor<br>Students |

| Activity | Tool | Suggestion | Organizer |
|---|---|---|---|
| **REGISTRATION** | Zoom, Meet, Teams | Support the realization of an adequate enrolment to the conditions of the student.<br><br>Virtual meeting with students for the review of the enrolment offer contrasted with the personal, social and economic conditions of the student. | Managers |
| **REGISTRATION** | Zoom, Meet, Teams | Make an adequate registration to the individual, social and economic conditions.<br><br>Virtual meeting with the teacher for the review of the registration offer contrasted with their personal, social and economic conditions. | Students |
| **MONITORING** | Institutional platforms for student notes | Verify the relevance of the registration made.<br><br>Review of the academic level of each student in the system. | Managers<br>Program coordinators |
| **MONITORING** | Institutional platforms for student notes | Verify the relevance of the registration made and implement adjustments if necessary.<br><br>Review of the grades that are to date and perception of the academic load. | Students |
| **TIME MANAGEMENT** | Google Calendar<br>Agenda del estudiante<br>Rescue Time | Organize the time, the routine of studies and the dedication to the different tasks of the day, in addition to observing their behaviour in a device (Rescue Time).<br><br>Create a task list and checklists organized by priorities. | Managers<br>Program coordinators<br>Professor<br>Students |
| **STUDY MANAGEMENT** | Evernote<br>Easy Study | Maintain a more organized and productive study routine. The Easy Study notifies what should be studied at all times. Evernote is like a notebook synchronized between different devices (computer, cell phone, etc.).<br><br>Create a personalized plan, defining how many subjects you study each day and for how long. In addition to being able to save annotations and contents. | Profesor<br>Students |

| Activity | Tool | Suggestion | Organizer |
|---|---|---|---|
| **GROUPS OF STUDIES** | Trello<br>Todoist | Study in groups and online and accompany the activities of each participant in the group.<br><br>Collaborative management of projects and activities that can be edited by several people involved.<br><br>Create lists of activities, composed of cards, to edit and move within task tables and status. | Professor<br>Students |
| **PERSONALIZED LEARNING** | Artificial intelligence | Intelligent online systems that adapt to the personal learning style | Managers<br>Program coordinators |
| **VIRTUAL EXCHANGE** | MOOC | Sign agreements with institutions abroad, organize courses and curricular activities by Programs or general contents and languages. Synchronous encounters can be scheduled with simple conversations, exercises, group discussions and games, shared classes. | Managers<br>Program coordinators<br>Professor |

Source: Authors.

Some actions that can be transformed into support mechanisms for students from digital technologies can be implemented from classes or by faculty, either as a pilot project or to meet the specific needs of each context or group. We take these actions as examples:

- Provide spaces for conversation.
- Promote research activities of universities to innovation and development through virtual exchanges.
- Create spaces where the student can deploy their full potential for imagination, creativity, autonomy and entrepreneurship, according to their own professional and vital interests.
- Increase internship opportunities where students can be tracked, e.g. simulators, exercises, activities in the LMS.
- Implement gamification in the educational process, either in the courses or at the level of the programs.
- Start by implementing "pilots" to test with a group and then scale up.
- Encourage more human interaction between teachers and students, and peer-to-peer.
- Collaborative learning.
- Workshop for the development of autonomy.
- Model *blended* (virtual and face-to-face).
- Relationship with society.
- Process automation through robotics.
- Virtual labs, students have the opportunity to design experiments, conduct them and learn on site, rather than just receiving theoretical knowledge about them.

In this sense, we propose each of these actions or activities as support mechanisms, in the foreground, to students, but they can help all actors in the educational system in their administrative or academic activities. In summary, the meaning of the use of digital technologies to mediate support mechanisms is presented in Figure 4.

**Figure 4.** The meaning of digital technologies


Source: authors, field research.

We understand that technology-mediated support mechanisms can be used in this time of emergency remote care and also in the post-pandemic context. In addition, it can represent a significant increase for the reduction of social and access gaps and inequalities, as well as it can promote digital literacy with the conscious use of the resources of digital technologies and the internet in academic and educational processes.

## 5. Final Thoughts

The relevance of this proposal is given by proposing support strategies based on what higher education students say, because they are the ones who best know their needs and realities for the adaptation of educational activities to the remote emergency modality in this pandemic period.

The most important thing is to generate a feeling of belonging in all the actors of the educational process and all the actors of the universities, that is, the students, obviously the teachers, the managers, but also the employees, that is, they are all the University, all are the educational institution, even if they do not have a direct activity with the students, are part of the educational process.

Finally, some ideas that are very important to think about permanence with equity and that this permanence leads to academic success. The attentive listening of everyone, the use of digital technologies not only for the moment of pandemic that we are living but in the future. In our society we use technology for everything, but when we get to class everything is left out. Why not also take them for classes?

Educational institutions must understand that they have the opportunity to reinvent themselves and become necessary powers for the economic and social changes that are to come. Especially in educational contexts, the insertion of technology has always been a very present issue, but in this pandemic period it has become a present reality and no longer in the near future. We currently have the opportunity to reflect on a digital pedagogy that seeks an effective partnership between all actors in education, not only teachers and students, but also the management of institutions and public authorities.

It is necessary to be aware that technology is not going to save the world, technology is not the solution to all problems. There are times when they should be used, using them well, but as a means. Technology is not the end, it cannot be considered the end in itself because it alone does not generate anything, conscious planning is necessary for the insertion of technology in class and in academic activities, so the digital literacy of teachers and students is also necessary so that the processes of teaching and learning through technology are meaningful.

Teacher and student training must be permanent, because we also have to prepare our students to know how to be in this universe that is the University and higher education. Interaction and collaboration are very important. Global citizenship allows us to consider other contexts and think from our perspective, how we can live in the most harmonious and meaningful world for all, and internationalization activities these are actions that can be of the University as a whole and also the professors with their students.

Finally, in Figure 5, the main objectives of the support mechanisms are presented, which are Permanence and Academic Success, which can be achieved by strategies that contemplate listening, digital technologies, teacher and student training, interaction and collaboration, global citizenship and internationalization. With that, we believe that we can provide students with a quality permanence in the university and, consequently, academic success from their graduation and entry into the labour market.

**Figure 5.** Objectives of the support mechanisms


Source: authors, field research.

We need to establish conditions so that everyone can access classes and academic activities in this time of pandemic and after, and here are very involved public policies that also have their role, their responsibility to provide access for all either to resources or to the internet. Make a reality a quality education that is not equal for all, but that can contribute to the needs of all and that access can help in this goal, achieving a quality and equitable education for all.

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