

## ICT teaching-learning: New challenge of cultural capital acquisition in university students during the COVID-19 pandemic



**Enseñanza-aprendizaje de TIC: Nuevo reto de adquisición de capital cultural en estudiantes universitarios durante la pandemia de COVID-19**

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### Abstract

The purpose of this research is to show how the teaching-learning process has worked after the COVID-19 pandemic and the use of Information and Communication Technologies (ICT) as a new challenge of cultural capital, the latter being a fundamental concept of Pierre Bourdieu's theory. The research took place at the Faculty of Social Sciences of the Autonomous University of Chiapas, where we worked with five seventh semester students of the Bachelor's Degree in Sociology and their experience with ICTs in the transition

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from face-to-face to virtual classes and the challenges that come with living in a space that has serious socioeconomic and technological inequality gaps since, among the results and conclusions, Among the results and conclusions, it can be mentioned that the limited access that both teachers and students had -derived from regional inequality- prevented the teaching-learning process from being carried out efficiently, however, the strategies used by the university community helped to solve this process because the motivation to continue studying was fundamental to achieve the purpose of the students, who, despite the fact that they were not able to use ICTs, did not have access to the Internet and did not have access to the Internet.

**Keywords:** Information and Communication Technologies, Digital Literacy, Cultural Capital, Digital Divide.

### **Resumen**

El propósito de esta investigación es mostrar cómo ha funcionado el proceso de enseñanza-aprendizaje a partir de la pandemia de COVID-19 y el uso de Tecnologías de la Información y la Comunicación (TIC) como un nuevo reto del capital cultural, este último, concepto fundamental de la teoría de Pierre Bourdieu. La investigación tomó lugar en la Facultad de Ciencias Sociales de la Universidad Autónoma de Chiapas, en donde se trabajó con cinco estudiantes de la Licenciatura en Sociología de séptimo semestre y su experiencia con las TIC ante la transición de las clases presenciales a las virtuales y los retos que conlleva vivir en un espacio que cuenta con brechas de desigualdades socioeconómicas y tecnológicas serias ya que, entre los resultados y conclusiones, se puede mencionar que el acceso limitado que tuvieron tanto docentes como estudiantes –derivado de la desigualdad regional- impidió que el proceso de enseñanza-aprendizaje se realizara de manera eficiente, sin embargo, fueron las estrategias usadas por la comunidad universitaria que ayudaron a solventar dicho proceso porque la motivación para seguir estudiando fue fundamental para concretar el propósito de los estudiantes, quienes a pesar

**Palabras clave:** Tecnologías de la Información y la Comunicación, Alfabetización digital, Capital cultural, Brecha digital.

## **Introduction**

Education has been one of the pillars of societies throughout the history of mankind, its transcendence has been so significant that it is basically part of the social structure per se. However, access to education is not equal for all citizens, especially those in developing countries and those living in poverty and extreme poverty. Although different governments around the world have tried to reduce the education gap, the reality is that there are still many areas globally that need urgent attention with respect to socio-educational issues. That is why the contemporary world has been characterized by analyzing social structures from their composition, therefore, it can be said that after the Second World War and specifically from the formation of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Universal Declaration of Human Rights, formal education (in schools) acquires great relevance, for this reason one of the proposals of UNESCO (2011) is that every individual has the right to receive education; It is then that the governments of the various countries have sought to provide free education to their population, however, for the population living far from urban centers or municipal capitals, access to education can be limited and even restricted.

One of the most representative of the last 30 years is the Education For All (EFA) movement of the United Nations Educational, Scientific and Cultural Organization (UNESCO), which arose from the need to bring education to the farthest reaches of countries around the world, with major objectives to achieve this goal, among which is the attention to provide early childhood education. In addition, it proposes to improve and extend comprehensive education, especially for those who need it most, i.e. vulnerable, socially marginalized groups. This project aspires to universal primary education. It is expected that children in situations of vulnerability and inequality will have access to free, quality basic education -primary-. It defines a type of education with fundamental competencies to be achieved in the learning processes of young people and adults. It seeks to ensure that learning reaches young people and adults and prepares them for active and daily life. One of the aspects it contemplates is adult literacy, for which it establishes conditions that facilitate their access to this process. It also aims to achieve gender equality from early childhood (primary and

secondary). This type of education, which is called quality education, aims to ensure the improvement of reading, writing, mathematics and practical skills.

The above is an example of the concern for homogenizing the quality of education around the world; For this reason, the Education For All movement has acquired great relevance since 1991 and has positioned itself as one of the socio-educational pillars whose objective is to guarantee quality education for all and, especially, for the most needy. Mexico is no exception, since it has regional inequalities of an educational and economic nature; according to the National Institute of Statistics and Geography (INEGI, 2022a), in the year 2020 the average level of schooling for people over 15 years of age in Mexico will be 9. This is equivalent to having a high school education, with Mexico City being the state with the highest level of schooling with 11.5 and Chiapas the state with the lowest, with 7.8, in the latter case it is a primary school level education. For this reason, our country has considered the recommendations mentioned by UNESCO's Education For All, in fact, during the World Education Forum held in 2000, our country joined the challenge of meeting challenges in a period of approximately 30 years (SEP, 2014, p. 7). One of the most transcendent is the massive reduction of illiteracy and the promotion of technological learning and life skills. It proposes facilitating access to basic education in remote and inaccessible areas and thus expanding early childhood education and development services. It also poses the challenge of improving the quality and performance of learning in education, addressing existing inequalities with respect to girls' and women's education. It will therefore have to generate strategies to ensure learning mastery and excellence for all.

Based on the above recommendations, the Ministry of Public Education (SEP) has carried out various educational programs to reach more places and provide quality education to a significant sector of the population; above all, it has tried to improve educational facilities or build more schools in order to reach more spaces in the diverse geography of the country. In addition to the aforementioned problem of regional inequality, in 2020 the education sector suffered a collapse as a result of the pandemic outbreak of COVID-19, since face-to-face activities -especially school activities at all educational levels- were suspended to avoid the spread of the virus and, in the

first instance, transferred to virtuality and the use of mobile and electronic devices to continue with the teaching-learning process.

This provided a complex panorama for education not only in Mexico but also around the world, because educational activities were transferred to television (basic education) and the Internet (through platforms such as Google Classroom, Google Meet or Zoom). This led to another problem: the lack of access to and knowledge about the use of information and communication technologies (ICT), which became essential for both teachers and students. According to INEGI (2021) and its National Survey on Access and Permanence in Education (ENAPE), during the 2021-2022 school year, of the total population between 3 and 20 years of age enrolled, 95.6% had a smart phone at home, 77.5% had digital television, 50.9% had access to a computer and 22.7% a tablet, 72.1% had internet at home, despite this, only 36.1% of the national population could attend distance classes, 35.6% in a hybrid way and 28.1% in a face-to-face way.

In the Mexican case, the little or no access to ICTs and the lack of knowledge about their use, became a problem nationwide, especially in the states of the Mexican Republic with the highest poverty and marginalization rates and the lowest in education and internet connection, such is the case of the state of Chiapas, where according to the National Institute of Statistics and Geography (INEGI, 2020), only 21.7% of the population has access to internet and ICT at home, being Tuxtla Gutiérrez, San Cristóbal de Las Casas, Chiapa de Corzo, Comitán de Domínguez and Tapachula de Córdova y Ordóñez, the municipalities with the highest connectivity rates in the entire state.

For this reason, we are faced with a problem that has mainly two bifurcations: the first is related to the management of cultural capital -specifically on the use of information and communication technologies- that the university community has, and the second is linked to the economic capital it has. According to the theory proposed by Pierre Bourdieu, there is a direct relationship between economic capital and the acquisition of cultural capital, and in the following section the social relevance of the study of ICT in education is discussed.

The social relevance of the study of new academic competencies on the use of information and communication technologies is essential today because, in the last two years, such knowledge management

has become essential in the Mexican educational system, in order to have access to education, both to receive classes -whether through television or a virtual platform- and to send homework to teachers. Although the teaching-learning relationship of ICTs has been present in UNESCO's objectives as well as in the country's challenges, the truth is that there has not been the capacity to bring this knowledge to all spaces, not even in urban areas. In the case of the Autonomous University of Chiapas, it has been detected that not all students have access to ICT, which has led to a greater gap in the teaching-learning process in the university community, in addition to the lack of technological skills related to the management of virtual platforms and self-management of learning that comes from being in virtual learning environments.

Regarding the sociological relevance of the educational phenomenon studied, it can be mentioned that Bourdieu's theory on cultural capital mentions that it can have three states (Bourdieu, 1987 and 2011): 1) Acquired (the way in which the human being begins to obtain knowledge, which usually comes from the family to formal education in schools), 2) Objectified (the way in which the individual focuses such knowledge in his daily life) and 3) Institutionalized (the acquisition of documentation that proves that he has such knowledge). However, Bourdieu (1987) establishes that the more economic capital one has, the easier it will be to obtain cultural capital, therefore, sociologically it is essential to mention that the use of information and communication technologies is currently fundamental for the increase of cultural capital, however, an elementary factor for accessing them, in short, is the management of economic capital.

From critical sociology, specifically from the contributions of Pierre Bourdieu (2007), there are historical conditioning factors that structure and are structured by the practices of social agents.

To explain the social inequalities that permeate school systems Bourdieu develops the notion of cultural capital, which he conceives as a condition that "imposes itself in the first place as an indispensable hypothesis to account for the differences in school results presented by children of different social classes with respect to "school" success, that is, the specific benefits that children of different classes and class fractions can obtain from the school market" (Bourdieu, 1979:11).

Cultural capital also radically debates the idea that success or failure in the school system is due to the natural aptitudes of individuals and points out the role of the school as a reproducer of social inequalities. In order to deepen this analysis, cultural capital is broken down into three states: incorporated, objectified and institutional. The incorporated refers to the tastes, dispositions and habits that subjects have embodied through interaction with their environment, so that it "can only be acquired, essentially, in a totally covert and unconscious manner and is marked by its primitive conditions of acquisition; it cannot be accumulated beyond the appropriation capacities of a particular agent; it weakens and dies with its bearer" (Bourdieu, 1979:12).

The objectified capital refers to the material goods that facilitate and stimulate access to culture, such as paintings, books, monuments, etc. These become meaningful insofar as they are related to the tastes and dispositions developed by the subject. That is to say, it is not enough to have access to these material goods, but there must be a symbolic appropriation of them and a specific cultural use by the subject, since "this cultural capital only subsists as material and symbolically active capital, to the extent that it is appropriated by agents and committed, as a weapon and as a gamble that is risked in the struggles whose fields of cultural production (artistic field, scientific field, etc.) -and beyond the field of the arts, scientific field, etc.) -and beyond the field of social sciences- are the place where agents obtain the benefits gained by the domination over this objectified capital" (Bourdieu, 1979:13).

Institutional capital refers to the status and possibilities of access to culture granted by acquired academic degrees. This type of capital carries implicit economic, time and effort values employed by the agents and which are validated and recognized by institutionalization. Hence, degree holders can compare themselves with others in the field, based on their investment in the school market (Bourdieu, 1979). In its three states, cultural capital demarcates the social differences that permeate the success or failure of students in the school culture.

Another state of cultural capital is the so-called objectified capital, which refers to the material goods existing in the social environment of individuals and whose interaction allows them to enrich their objectified and/or institutional capital, since it provides them with the necessary inputs to move through school and academic spaces in

a favorable situation. In addition to the permanence and performance in these spaces, individuals make use of objectified capital to deploy their empowerment potentialities in the group relationships they establish. In this area, the strengths of cultural capital allow individuals to increase their symbolic, economic and social capital. In short, cultural capital consists of knowledge that is not only acquired in formal education (school), but also within the family - and its class membership- and society; therefore, a fundamental part of this theory is that the greater the accumulation of knowledge, the better the positioning of the individual in the social structure, however, to achieve this more easily, it is necessary to have economic capital that allows obtaining these objectives quickly. Now, what happens with the lack of access to and knowledge about the use of information and communication technologies and their relationship with Bourdieusian theory? It can be said that, since technologies are elements that are immersed in daily life and, above all, are an essential part of everyday academic life, then their acquisition and management become key elements in the new conformation of cultural capital.

Since the pandemic outbreak of COVID-19 and the transition from face-to-face academic space to virtual learning environments, it became essential to have information and communication technologies, internet and the acquisition of competencies related to the use of technology. For this reason, the state of Chiapas, with high rates of poverty and marginalization, and low levels of technology use and connectivity, produced a collapse effect in the virtual learning environments as a means to solve the ravages of the pandemic.

The institutions of higher education in Chiapas, carried out various strategies to meet the educational needs that were arising at that time, therefore, in the case of the Autonomous University of Chiapas, the first semester of 2020 (January-June), was urged to complete the activities through virtual platforms such as GoogleMeet or Zoom, so that students attend their synchronous classes normally performed face-to-face; during the second semester of 2020 (July-December) and the first semester of 2021 (January-June), a transfer was made to the virtual platform Educa-T, which belongs to Moodle, where teachers would upload the academic programs and activities corresponding to their subjects and classes would be scheduled according to the established schedules. During the July-December

2021 school year, hybrid activities were already in place (support from the Educa-T virtual platform was never discontinued), although in 2022 classes were face-to-face, the use of the platform continued to be indispensable as a support in the teaching-learning process. However, several problems were noted throughout these two years, firstly, the lack of knowledge of the use of ICTs by some sectors of the university community - teachers, students and administrative staff - and secondly, the lack of access to these technologies, which can be related to the socioeconomic and educational capital of the state of Chiapas, since, according to INEGI (2022b), out of every 100 people over 15 years of age, 13 have no schooling, 55 have completed basic education, 18 have completed high school and 13 have completed higher education.

In the case of the Autonomous University of Chiapas, specifically the Faculty of Social Sciences (located in San Cristobal de Las Casas), the synchronous use of the Educa-T tool has been affected due to the fact that most students live in rural areas of the Chiapas Highlands, which do not have the necessary ICT infrastructure to connect synchronously, In addition, it is worth mentioning that even living in an urban area, there is no access to quality connectivity, resulting in a gap between students and teachers regarding the use and access to information and communication technologies. Although Educa-T has a friendly and intuitive environment, the reality for students is that they cannot efficiently access the platform, having to travel to municipal capitals -or places that have internet- to download their homework, essentially to their mobile devices, since not all of them have a computer.

According to the National Survey on Availability and Use of Information Technologies in Households (ENDUTIH), conducted by INEGI (2022c) in collaboration with the Federal Telecommunications Institute, the states with the highest percentage of population that used the Internet in 2021 were: Mexico City with 88.3%, Baja California with 86.8% and Sonora with 85.8%, while the states with the lowest percentages were: Chiapas with 46.1%, Oaxaca with 56.9% and Guerrero with 61.4%. The states with the lowest percentages of internet in homes were: Chiapas with 30.8%, Oaxaca with 39.0% and Veracruz with 51.1%. These percentages show the extent of internet use in Chiapas.

## Materials and methods

The object of study addressed is the cultural capital differentiated from the use of Information and Communication Technologies (ICT), inferring that its causal description is that economic capital affects the acquisition of technological cultural capital, which in turn comes from the regional differentiation experienced by teachers and students of the Autonomous University of Chiapas. The analytical categories for the analysis of this study are: globalization, information and communication technologies, cultural capital and economic capital.

Throughout history, man has had the need to seek answers to the phenomena that occur around him, thus, the scientific method was established as a way to provide such answers. According to Tamayo (2003), scientific knowledge is a way in which man can give meaning to reality through the following steps: 1) Observation, 2) Discovery, 3) Explanation, 4) Prediction and 5) Systematic knowledge of reality. The aforementioned steps provide an idea of how to systematize the information obtained. It should be mentioned that although throughout history the scientific method has been used in order to provide a clear and above all objective-rational explanation of the phenomena, not all researchers have agreed with the same explanations to account for what happens, therefore, throughout history there have been many ways to explain a phenomenon through different positions, this is called epistemology. According to Tamayo (2003, p. 26) the formalizing epistemological method is the following:

It refers to the direct analysis of knowledge, to determine formal conditions and their relations with experience. [...] Every process of knowledge presupposes a process of thought, a reasoning. We can study knowledge under the aspect of the judgments and reasoning that have made it possible, which is a task of logic.

According to the above, it can be mentioned that epistemology is the science that studies how and where knowledge comes from, however, there are several epistemic paths, therefore, the way to explain social reality will depend on the epistemic path taken, example of epistemic routes are constructivism, structuralism, phenomenology, hermeneutics or positivism (just to mention a few). In fact, philosophy is the basis of scientific knowledge and from it

derives epistemology, which is a branch that studies the origin of knowledge, as shown in image 1:

**Image 1.** Construction of scientific knowledge



Note: Own elaboration.

According to image 1, both philosophy and epistemology are essential to account for the events of a given space-time. However, the objectivity of knowledge has been questioned over time, due to the epistemological path and school of thought in which the researcher is situated, so it is common to find contradictions among researchers, as they advocate that their epistemic path is the one that best explains reality.

Taking into consideration the above, this research has a philosophical-epistemic basis based on structuralism, since social systems are constituted by a set of norms and rules which - for the most part - are accepted and adopted by the community to be included in a specific society; one of these rules of the social system is to enter the educational system.

The type of methodology used is mixed, since it has in the first instance a quantitative approach under a non-experimental research design, since it does not deliberately manipulate reality, nor does it apply specific stimuli. A type of correlational study, of a trans-sectional nature, is used, since it is limited to measuring the relationship between variables at a specific time. In a second phase, a qualitative approach is presented through a case study, which according to Hernández Sampieri (1997) is where the basic characteristics of a given space-time are studied in depth. The population we are working with to carry out the research are students and teachers of the Faculty of Social Sciences of the Autonomous University of Chiapas, which is located in San Cristóbal de Las

Casas and has four undergraduate degrees: Social Anthropology, Economics, History and Sociology. Specifically, we will work with teachers and students of the Sociology degree, the sample will be chosen by opportunity.

In the quantitative phase, the cultural capital of the students was determined by means of an instrument that would allow measuring it in its three dimensions. Specifically, it is a survey based on a Likert scale on the types of cultural capital. It is a survey of fifteen questions, approximately five for each type of cultural capital. The responses range from a high level of intensity, which is represented by the number one, to the lowest intensity, which is represented by the number five. The piloting indicated a high reliability, which made its application feasible throughout the sampled population.

For the qualitative phase, the data collection tools applied to teachers and students are the following: direct observation, survey and structured interview. With all this, it is intended to carry out an analytical type of research, since it is not only desired to know and explain the problem in depth in a specific space-time, but also to identify relationships between various elements such as cultural capital, economic capital and regional inequality. The techniques applied made it possible to detect general elements of the situation experienced during the pandemic in order to experience teaching processes through technologies. The experiences of the educational actors are revealed.

In order to determine cultural capital, based on Bourdieusian theory, the students' school situation was taken as a contrasting element, which for practical reasons we call school achievement. The following hypotheses were proposed and subjected to correlational test statistics.

General Hypothesis:

School achievement differs significantly among students with different levels of cultural capital.

Secondary hypotheses

1. At least two of the student achievement averages classified according to the type of texts they access differ significantly from one another.
2. At least two of the student achievement means classified according to the type of places they can travel to differ significantly from each other.

3. At least two of the means of student achievement classified according to the type of technological means they have to carry out their school activities differ significantly from each other.
4. At least two of the means of student achievement classified according to the type of activities they do in their free time differ significantly from each other.
5. At least two of the student achievement means classified according to the type of extra-institutional courses taken differ significantly from each other.

For the qualitative analysis, some elements recovered from the interviews and observations applied to students and professors of the Autonomous University of Chiapas are presented. The data recovered have to do mainly with how the teaching processes were through technologies, during the pandemic. The following dimensions were recovered:

- Strategies for teaching through technology.
- Learning generated with the use of technology
- Difficulties encountered
- The challenges that the use of technology continues to impose on students with different cultural capital.

## Results

To test the hypothesis that students' school achievement is different due to their level of cultural capital, five secondary hypotheses were proposed, derived from the indicators of the instrument, which account for the different levels of cultural capital, according to the tastes, habits, cultural milieus and academic degrees of the students studied. The hypothesis test used was Fisher's F test. In accordance with the six-step method, the conditions for the use of Fisher's F were met and the theoretical values were established that allowed the interpretation of the results obtained by the SPSS statistical program, which are shown below.

**Table 2.** *Analysis of hypothesis testing*

HIP.SEC.	RESULTS	STATISTICAL DECISION	INTERPRETATION
1	$F_c = 7.384$	As $F_c \in$	<b>WITH 95% RELIABILITY, THERE IS SUFFICIENT EVIDENCE TO ASSUME</b>

		$[2.463, \infty)$ $H_0$ is rejected .	<b>THAT AT LEAST TWO OF THE ACHIEVEMENT MEANS OF THE GROUPS OF STUDENTS CLASSIFIED ACCORDING TO THE TYPE OF TEXTS THEY ACCESS DIFFER SIGNIFICANTLY FROM EACH OTHER.</b>
2	$F_c = 6.685$	As $F_c \in [2.463, \infty)$ $H_0$ is rejected .	<b>WITH 95% RELIABILITY, THERE IS SUFFICIENT EVIDENCE TO ASSUME THAT AT LEAST TWO OF THE ACHIEVEMENT MEANS OF THE GROUPS OF STUDENTS CLASSIFIED ACCORDING TO THE TYPE OF PLACES THEY CAN TRAVEL TO DIFFER SIGNIFICANTLY FROM EACH OTHER.</b>
3	$F_c = 5.057$	As $F_c \in [2.463, \infty)$ $H_0$ is rejected .	<b>WITH 95% RELIABILITY, THERE IS SUFFICIENT EVIDENCE TO SUPPOSE THAT AT LEAST TWO OF THE MEANS OF STUDENT ACHIEVEMENT OF THE GROUPS OF STUDENTS CLASSIFIED ACCORDING TO THE TYPE OF TECHNOLOGICAL MEANS THEY HAVE TO CARRY OUT THEIR ACADEMIC ACTIVITIES DIFFER SIGNIFICANTLY FROM EACH OTHER.</b>
4	$F_c = 6.559$	As $F_c \in [2.463, \infty)$ $H_0$ is rejected .	<b>WITH 95% RELIABILITY, THERE IS SUFFICIENT EVIDENCE TO SUPPOSE THAT AT LEAST TWO OF THE MEANS OF SCHOOL ACHIEVEMENT OF THE GROUPS OF STUDENTS CLASSIFIED ACCORDING TO THE TYPE OF ACTIVITIES THEY DO IN THEIR FREE</b>

5	$F_c = 2.989$	AS $F_c \in [2.463, \infty)$ $H_0$ IS REJECTED .	<p><b>TIME DIFFER SIGNIFICANTLY FROM EACH OTHER.</b></p> <p><b>WITH 95% RELIABILITY, THERE IS SUFFICIENT EVIDENCE TO ASSUME THAT AT LEAST TWO OF THE ACHIEVEMENT MEANS OF THE GROUPS OF STUDENTS CLASSIFIED ACCORDING TO THE TYPE OF EXTRA-INSTITUTIONAL COURSE THEY HAVE TAKEN DIFFER SIGNIFICANTLY FROM EACH OTHER.</b></p>
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The results of the hypothesis tests show how the academic performance of students is mediated by their cultural capital and therefore, the use of technology in the teaching and learning processes, considering it within the item of incorporated capital, has a fundamental impact on it, therefore, it will be necessary to think that the digital gap among vulnerable populations must be addressed, so that this type of education, which was tested in the pandemic and also left novel contributions to educational practices, has coverage with equity.

The qualitative analysis of the data obtained with the help of Atlas Ti can be summarized in four major dimensions that recover the experiences of students and professors lived during the pandemic, where nodes stand out that mark guidelines to redefine the use of technologies in the university and in each of the school spaces.

Strategy for teaching through technologies with university students. When questioning students about working through technological means during the pandemic, most agree that it was an assertive strategy in terms of health protection. They recognize that it is important and necessary, although they express that when compared to the face-to-face modality to which they were accustomed, they do not like it at all. They point out that the pandemic took them by surprise without preparation in academic and digital competencies to make use of these resources beyond those who commonly use them.

They emphasize that when educational processes are through technological platforms and media, there must be delimitation of time and space, they have to adapt to the rhythms and needs of learning to avoid the anguish and stress that this type of modality can generate and the students are the most affected. Hence, some of them expressed dissatisfaction, because the pedagogical relationship was distant, dehumanized, and they cannot recover the bonds that are generated in everyday life. Care must be taken to ensure that the machine does not separate them and that meaningful learning is fostered.

Pedagogical relationships in technology-based education

Teaching through technological media is an unprecedented pedagogical relationship, since some technological resources and tools displace the pedagogical agent, who must make sure that these resources are only a support, but without losing sight of the fact that the subjects are the ones who construct knowledge through interaction with them, so flexibility must be sought by making the appropriate modifications or looking for a technological resource more appropriate to the content or the objectives set. Otherwise, stress and fatigue are generated for both teachers and students when this is not considered.

The use of technology in educational processes does not eliminate the pedagogical relationship. In spite of the fact that a great part of the students interviewed indicated that the relationship feels colder in the virtual space than in the face-to-face space, it should promote an interaction where students and teachers are considered subjects, a constant interaction should be monitored, a communication based on listening and dialogue, which breaks with the idea that technology is only used as a resource to transmit information that the student receives as a bank, Rather, technological resources should be considered as triggers for learning, as provocative activities that challenge learners to venture into areas that until now seemed alien to them and allow them to access broader references that will increase their knowledge.

An important point made by the students is that sometimes, the use of technology for learning environments represents a pedagogy divorced from life, the contents alien to what is being lived, to the context, which is unacceptable, because the platforms or virtual classrooms do not prevent at all, interaction and the establishment of ties, The use given to them depends on the pedagogical positions of

those who promote them, they can be tools for the reification of students, reducing them to receivers of instructions and executors of tasks, or to visualize them as active agents who have at their disposal the technologies to build learning.

Among the difficulties that the interviewees faced during the pandemic to access the development of their educational programs through technological means, there are three aspects. The first of these represents a set of factors related to the social sphere; the second to the personal sphere and the third to the pedagogical sphere. Each of these areas has different manifestations, but for the purpose of communication, a synthesis of each area is made.

With respect to the social sphere, it was found that there is a concrete evidence of a digital divide, where the resources available to students do not always guarantee access to the Internet and digital media. They point out that, although they have internet service, the bandwidth is not always efficient and therefore certain resources such as videos or work on platforms or virtual classrooms are not affordable for them and have to be replaced by less demanding resources, but also less dialogic, such as WhatsApp, audios or text messages. Care must be taken to ensure that the use of technology in education does not lead to the exclusion of the less privileged; equal opportunities must be sought.

On a personal level, the interviewees mentioned that, in addition to the technical difficulties of virtuality, they have difficulties linked to situations of poverty and social marginalization that translate into daily inconveniences such as not having the basic infrastructure at home for virtual work. They emphasize that they personally have to face the demands of the activities within the technological platforms with their real possibilities, which generally derive from precarious family dynamics. Poverty, where school is not a priority and therefore represents a much more considerable effort for them than for others.

A major difficulty in the pedagogical field is that there is a risk that the use of technologies in teaching may lead to the exclusion of students who learn differently from their peers. The premise that there are different rhythms and styles of learning must be taken into account, and if the inclusion of different abilities is desired, the homogenization of the curriculum must be avoided, since working in virtual environments can lend itself to mechanization, to the use of prescriptive indicators that lead to the execution of tasks where

reflection and flexibility of learning are not deprived, much less to considering the diversity of abilities.

One of the great challenges for the use of technology in educational institutions is to resignify pedagogy towards a humanistic, emotional pedagogy between teachers and students that is realized through technology, but transcends it. The aim is to generate a constructivist, loving, non-extensionist and non-colonialist view, in which citizens build a solidary formation, where collectivity prevails over individualism, so that technological resources are only a tool that is at the service of man and social welfare, with justice and equity. Therefore, it is necessary the presence of a teacher trained in pedagogy can turn any error into a learning opportunity, but also with training in the management of platforms, media and various virtual tools to be used, according to the context, capabilities and personal conditions of students.

## **Discussion**

An important contribution of this research is that it clearly shows how differences in school achievement are not a cognitive issue, since by working with a population with similar logical-mathematical thinking development, the functionalist premise that differences in access to school culture are of a natural nature, attributed to the individual, is eliminated beforehand, and shows how social conditioning factors and inequality of opportunities are present in the success or failure faced by students in school on a daily basis.

Another issue that this study brings to the table for discussion is that the use of technologies in university education during the pandemic has increased significantly and has had a considerable impact on the way professors teach and students learn. professors, in turn, have had to adapt their teaching methods to virtual platforms, such as learning management systems and videoconferencing tools. This transition has been a challenge for many, but it has also opened up new opportunities to make the most of technologies in education. Once students had to interact with them and face processes that they did not handle, they deployed a series of capabilities that enriched their knowledge and were left to be used in normal contexts.

One of the most important challenges has been to ensure that all students have access to the technologies necessary to participate in

online education. Not all students have reliable Internet devices or connections, which can lead to inequalities in access to education. Universities have had to implement measures to provide technology resources to students in need, such as equipment loans or subsidies for connectivity, providing access to online learning platforms, learning management systems, digital libraries, and online collaboration tools.

One issue that was keenly felt and expressed in a variety of ways by students and faculty was the emotional and motivational challenges generated by the use of virtuality during the pandemic such as lack of face-to-face interaction, feelings of isolation and difficulty in maintaining motivation are some of the common problems. It is critical that universities provide emotional support and resources to maintain the motivation and well-being of the student and faculty community.

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