ICT in the family context in times of confinement: connectivity and communication experiences of university students

Las TIC en el contexto familiar en tiempos de confinamiento: experiencias de conectividad y comunicación de estudiantes universitarios

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Abstract

Faced with the health emergency that has occurred since 2020 due to the global coronavirus pandemic (COVID-19), society had to adapt to new contexts with the help of Information and Communication Technologies (ICT). Face-to-face work was interrupted in its daily activities by the mandatory confinement and at the same time the virtual modality was

chosen, which for several years had already been applied in distance higher education and in areas of the digital economy, but now it was strengthened by the need to continue fulfilling the same work specifically in the educational field. The use of ICT has become an essential element, and under this need social actors with different realities converged, so the present study aimed to reveal which were the forms of access to information and communication by students of the National University of Chimborazo (UNACH) during the year 2020. A quantitative diagnosis of the percentage of connectivity, type of service, with a descriptive non-experimental transactional design in reference to access to technological devices that university students have was performed. The results obtained in this investigation allowed to know that 70% of students of the 4 Faculties that conform the UNACH during the year 2020 made shared use of devices with other members of the family to execute their academic activities and telework within the home.

Keywords

Context, connectivity, confinement, covid19, devices, family, ICTs.

Resumen

Frente a la situación de emergencia sanitaria ocurrida desde el año 2020 por la pandemia mundial de coronavirus (COVID-19), la sociedad tuvo que irse adaptando a nuevos contextos de la mano de las Tecnologías de la Información y la Comunicación (TIC). El trabajo presencial se vio interrumpido en sus actividades cotidianas por el confinamiento obligatorio y a la par de aquello se optó por la modalidad virtual que durante varios años atrás ya se aplicaba en la educación superior a distancia y en ámbitos de la economía digital, pero ahora se vio fortalecida por la necesidad de seguir cumpliendo la misma labor específicamente en el campo educativo. La utilización de las TIC se ha convertido en un elemento imprescindible, y bajo esa necesidad confluyeron los actores sociales con distintas realidades, por lo cual el presente estudio tuvo como objetivo revelar cuales fueron las formas de acceso a la información y la comunicación por parte de los estudiantes de la Universidad Nacional de Chimborazo (UNACH) durante el año 2020. Se realizó un diagnóstico cuantitativo del porcentaje de conectividad, tipo de servicio, con un diseño no experimental transaccional descriptivo en referencia al acceso a dispositivos tecnológicos que tienen los estudiantes universitarios. Los resultados obtenidos en esta investigación permitieron conocer que un 70% de estudiantes de las 4 Facultades que conforman la UNACH durante el año 2020 hicieron uso compartido de dispositivos con otros miembros de la familia para ejecutar sus actividades académicas y de teletrabajo dentro del hogar.

Palabras clave

contexto, conectividad, confinamiento, covid19, dispositivos, familiar, TIC.

1. Introduction

The health crisis caused by the coronavirus (Covid-19) since April 2020 turned technology into that alidade to continue advancing with the tasks of daily life, being a necessary alternative to streamline services that in another era would have meant a partial or total paralysis of activities. Thus, as a result of these situations generated by the pandemic, a process of investigation was carried out to show through this research work the situation of higher education students who, from different sectors of Ecuador, found themselves in the need to continue their academic performance (Chirinos et al., 2020).

The National University of Chimborazo (UNACH) since its creation in 1995 has provided an education in a face-to-face manner and its curriculum responds to it, however, since 2014 it adopted a Blearning model with its Moodle platform, i.e. it was adapting to a combined

modality between the face-to-face and the virtual, which allowed both synchronous and asynchronous classes with students in 2020 to be carried out under this not so unknown context. However, this research is based on the reality experienced by each of the members of a family and how they had to adapt to this new modality due to the same need to have technological equipment, connectivity, and even the knowledge for the use of these technological services from the basics to the most advanced; to this is added factors such as sharing the same learning environment, the economic reality within the home, among others.

This work takes relevance from this situation of social nature that allowed to know how communication was carried out during this time of confinement between the actors belonging to the family, of which we highlight the university students and the use they gave to the tools and digital platforms in combination with the so-called teleworking. The contribution of this study is relevant not only for the fact of carrying out an investigation by time of pandemic, but because it became notorious from the obligatory nature of taking shelter in a virtual way to know in depth the situation of a society that currently lives the Digital Age. However, a journalistic note of El Mercurio Newspaper called "Education and pandemic" highlights that the educational field still remains an emergency situation where the policies adopted by the forced social distancing, have modified the conditions of a formal education in its infrastructure and communicative structure and were modified by turning to digital platforms, where teaching is separated from conventional classrooms and homes were transformed into school work spaces (Negrete, 2020).

Then, during this modality, the true condition of infrastructure and available resources was evidenced, especially in each of the homes of university students, such is the case presented in this research of those who belong to UNACH, since they come from different social conditions and from different regions and sectors of Ecuador (Table 1).

2. State of the art

Universities worldwide were no exception to move almost immediately and adopt the modality of synchronous classes through virtual platforms, a very worrying fact to know if the equivalence was going to give the same results in their students to continue with the same or better learning percentage, as in the face-to-face, that is where many relevant globalized research questions begin to arise. Now that we have been able to experience this phase of digital transformation of the university, it would be a big mistake to repeat and face situations without adequate reflection and planning. Francisco García in his speech at the IX International Digital 2020 Conference, highlights that perhaps it was evidenced that the University in innovation issues is not as mature as it was thought, which invites to take seriously the strategic and leadership factor of the rectorial teams to build a digital, inclusive, participatory and especially human university (García-Peñalvo, 2020).

Under this approach, the first point to analyze is the level of the so-called "Digital Divide", a term often used to define the lack of access to connectivity or the use of technological equipment, whether smartphones, laptops or desktop computers; but as shown in Figure 1, it is an abyss that grows over time, over those aspects that are notorious in the imperative requirement to combine academic activities with technology, as it happened since March 2020 with the so-called virtual classes, which was only a meeting via internet by teachers and students through videoconferencing. Therefore, referring to a digital gap also implies those innovative methodologies on the part of teachers, in trying to resort to pedagogical patterns in the adaptation of the face-to-face to the strictly online, and that in the end ended up becoming a space where only publications with text content in PDF format and videos from the Youtube platform were shared with students.

Figure 1. Digital Divide, adapted from (García-Peñalvo, 2020)

If we explore the reality of universities around the world, we see that "this global shift to online learning follows the example set by universities in China, where the outbreak began. Such rapid global adoption of online education is astounding. Before the coronavirus, the use of online learning in higher education had shown a slow pace of change" (Abreu, 2020, p. 2); and now it is neatly becoming the only option, especially if a confinement is repeated whatever the reasons, therefore, the needs arise to not only ask if it should be done, but how fast it can be done. The role of the University in the context of the pandemic entails projecting itself into an uncertain future where the lack of resources, both material and technological, will always seek to mark a limit, and where it often becomes the usual excuse; However, now with this online modality, subjects must be adapted through continuous communication with students and the use of both synchronous and asynchronous tools, and through an amazing response capacity, in record time, spaces for online productions and practices were created to assist teachers; there were also opportunities to send materials, create contents, learning and teaching resources, etc.

From this joint work of authorities and teachers to build those spaces equivalent to what existed in face-to-face and now in virtuality with a view to continuing with the academic work, other personal circumstances arise in students and their families, starting from reflecting on whether they have a computer for exclusive use and their own high-speed connectivity for proper monitoring of virtual teaching (Cabrera, 2020) notes that the educational level of families, although not exclusively, acts as a gradient of inequality (Pérez-López et al., 2021).

Students, for their part, in the eagerness to fulfill the proposed tasks, in some cases with the teacher's guidance and in others autonomously executed their multimedia presentations, their permanent consultations through the publication of their work in blogs and the pedagogical use they gave to social networks such as Whatsapp and Facebook. "Teachers have mostly opted for an asynchronous model accompanied by teacher-discussant interaction based on communication through e-mail, forums, or chat" (Pérez-López et al., 2021, p. 339). It is shown then that communication is a determining factor to avoid the isolation effect that usually occurs in distance learning models. Cases presented in countries such as the United States through the donation of computer equipment and Internet cards to public school students showed that barely half of the students in the poorest counties - and with the highest percentages of undocumented immigrants - were attending online classes. In Mexico, through a digital newspaper publication, Nurit Martínez highlights the work of Higher Education Institutions such as the Universidad Autónoma Metropolitana (UAM) that donated 3,865 tablets equipped with internet cards to students in vulnerable conditions of access to technology and internet (Martínez, 2020).

A small part of the population is benefiting from these programs and have the possibility that online education will become the norm for the coming months or years, as well as it is also immediate to find new solutions and initiatives. "Some examples are the use of digital platforms to upload videos and documents by teachers and students, at times when they have internet. Another option, which is being used by some intercultural universities, is the

creation of forums in WhatsApp and Facebook that can be accessed from cell phones" (Lloyd, 2020, p. 119).

3. Metodology

3.1   3.1 Data Collection

The population considered for this research was 9980 students from the four faculties (Engineering, Political and Administrative Sciences, Health Sciences and Education Sciences) of the UNACH.   This tabulated information shows that it is a national reality since it can be seen in Table 1 that UNACH students belong to the 24 provinces of Ecuador.

The research design is non-experimental, transactional, descriptive and descriptive from a quantitative approach to diagnose the percentage of connectivity, type of service, in reference to access to technological devices that university students have.   The focus of the study was quantitative and the scope of the research was descriptive, since the aim was to determine the percentage of access to ICTs of university students in the family context in times of confinement.

	Nº	%
Gender		
Femenine	5640	56
Masculine	4340	44
Other	0	0
Total	9890	100%
Province		
AZUAY	31	0,3%
BOLIVAR	378	3,8%
CAÑAR	131	1,3%
CARCHI	94	0,9%
CHIMBORAZO	5837	58,4%
COTOPAXI	394	3,9%
EL ORO	78	0,8%
ESMERALDAS	67	0,7%
GALAPAGOS	16	0,2%
GUAYAS	58	0,6%
IMBABURA	170	1,7%
LOJA	100	1,0%
LOS RIOS	32	0,3%
MANABI	29	0,3%
MORONA SANTIAGO	202	2,0%
NAPO	180	1,8%
ORELLANA	99	1,0%
PASTAZA	214	2,1%
PICHINCHA	503	5,0%
SANTA ELENA	9	0,1%
SANTO DOMINGO DE LOS TSACHILAS	230	2,3%
SUCUMBIOS	126	1,3%
TUNGURAHUA	952	9,5%
ZAMORA CHINCHIPE	50	0,5%
TOTAL	9980	100%

Table 1. UNACH student data collection - Gender and Province of residence.

Data collection was carried out using the survey technique and a questionnaire was used as an instrument. A sample was not selected, since the study is descriptive, so we worked with the entire population. The data were obtained in the month of April 2020, that is, at the beginning of the academic period May - October 2020 and for their processing a filtering was performed using tables and Excel spreadsheets, descriptive statistics were used and bar graphs were used to describe each of the results obtained from each of the questions of the questionnaire applied.
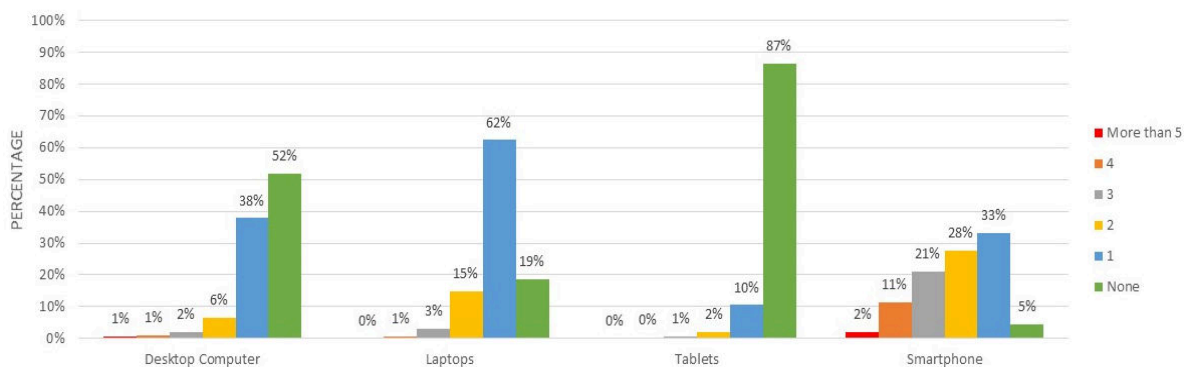
4. Results and Discussion

Figure 2. Student access devices

Smartphones between 1 and 4 devices with 95%, laptops between 1 and 2 devices with 80% and desktop computers between 1 and 2 devices with 46% are the percentages that UNACH students used for their academic work (Figure 2); it can be seen at first glance that there has been a variety of devices and equipment; however, the interpretation is different, since within the home the reality has forced the exchange with other family members as seen in Figure 3, therefore it is analyzed that only 62% of laptops, 38% of desktop computers and 33% of smartphones were probably exclusive to perform such activities.

It is evident that conducting ICT-mediated classes has not been an easy task, especially because it has been implemented with very little preparation time and in advance. The organization within each household was a fundamental point to exchange those devices and equipment according to the needs of each member, and not only for the academic issue, but also for the telework of their parents or relatives. All this experience has been an opportunity for both teachers and students to explore the different tools that information and communication technologies can offer them. Using podcasts, YouTube, digital resources from publishing houses, radio and television programming, flexible self-learning guides and thus maintaining certain levels of interaction, in addition to not lowering the level of educational quality (Chirinos et al., 2020).

These devices had to adapt to the consequent need for activities that were developed in both synchronous and asynchronous classes, with the participation of forums, or WhatsApp and Facebook groups, and of course access from cell phones was indispensable. In most of the homes of UNACH students use between 4 people or more the same internet connection giving as a consequence through this data obtained that family members alternate the use of the devices, and in turn considering the previous analysis in which it was pointed out that they use the devices both laptop and desktop computers (Figure 2). This implies a very serious and determining disadvantage at the time of fulfilling synchronous tasks.
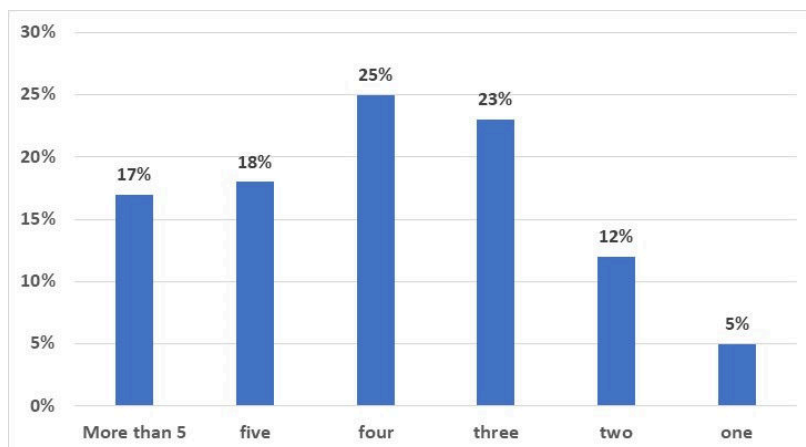
Figure 3. Number of people using the Internet at home at the same time.

For most, their first experience with virtual education came with confinement due to the pandemic. Likewise, this research has opened up other fundamental points such as inquiring about "other inequalities that have been exacerbated by the health and economic crisis in the world, including shortages of money and food due to layoffs in their odd jobs; the demands of caring for children and other family members; increased housework, etc." (Lloyd, 2020, p. 120).
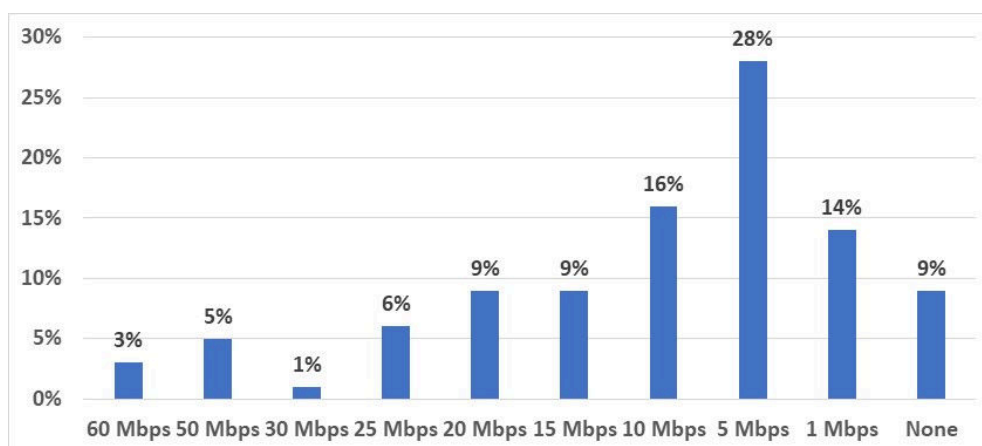

Figure 4. Speed of Internet service among students.

Once known the percentage of internet speed that each one of the students of the Universidad Nacional de Chimborazo has, it is determined that most of them do not have an optimal performance in connectivity since all family members are running different activities simultaneously, which affects the development of the proposed tasks and works.

Such demands affect those who have less economic possibilities due to the cost of hiring a fiber optic service, also within a little analyzed aspect is that of female students of all socioeconomic levels, since they have assumed a much greater burden of work at home during the contingency, which necessarily impacts on their level of academic productivity.
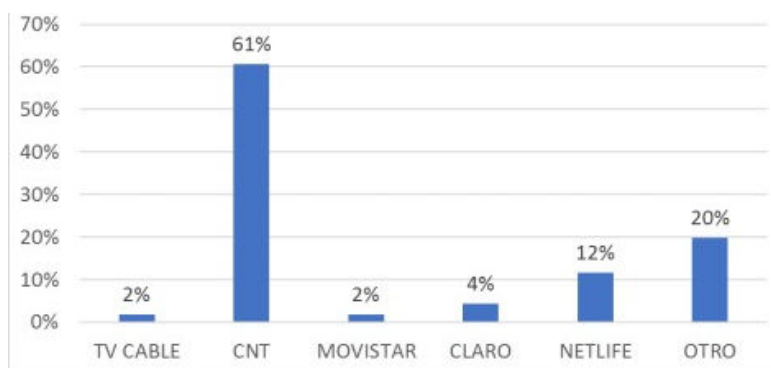
Figure 5. Internet providers for students

During this period of confinement due to the pandemic, the growth of telecommunications services accelerated, where 70.7% of the population in Ecuador used the Internet, which represented 11.5 percentage points more than in 2019.   In rural areas it grew 14% and in urban areas, 10.4%. Of the total number of users, 92.1% used the Internet once a day. Also, the number of activated smartphones grew from 59.9% to 62.9% (El Comercio, 2021).

In the study, it is observed that the inconveniences are presented by having a service that has deficiencies along many geographical points of the city, province and country, since many students live in rural sectors. In addition, it is also confirmed through this data analysis that there are students who make balance recharges on their smartphones to connect to synchronous classes, which is not a guarantee of efficiency in their use and development of autonomous online activities.

5. Conclusions

The data obtained were filtered based on 3 important aspects such as the type of devices, and the number of devices that the surveyed students had, which in the end allowed us to know that approximately 70% of them share their devices with other family members. These analyzed data reveal the reality of most of the homes of university students, who during the time of confinement have had to look for ways and means to be able to fulfill their academic work.   These difficulties presented as for example the internet connection, forces to consider a type of variants that can help and combine the activity developed with online education, and that is propitious to execute another research to determine if it was the factor that many students took at the end of the semester as an option of withdrawal in properly experimental subjects.

By showing these realities we can verify that students do not have electronic devices, likewise they do not have computers that allow them to work in academic activities during long periods of synchronous classes, it can also be observed that 25% have not made use of any type of device or equipment (Figure 2) in their academic activities, which is also worrisome.

Finally, the data indicate that internet is very necessary in homes as a basic service, so families in their homes have required the installation of internet being CNT the most requested (Figure 5), although this operator presents problems in the quality of service due to the intermittency for a long time (La Hora, 2021), which causes the continuous abandonment of synchronous sessions (Figure 6).

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