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Artículos científicos

Apropiación social de tecnologías digitales por jóvenes universitarios mayas de Quintana Roo

Social appropriation of digital technologies by young Maya students of higher education from Quintana Roo

Apropriação social de tecnologias digitais por jovens universitários maias de Quintana Roo

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Resumen

La brecha digital es un problema que se articula con otras desigualdades y afecta a poblaciones en condiciones de pobreza. Así, la mayoría de las regiones indígenas en México presentan dificultades para conectarse, a pesar de que el uso del teléfono celular ha proliferado en la última década en zonas rurales, donde los jóvenes son los usuarios más activos. Este estudio etnográfico retoma el concepto *apropiación social* de las tecnologías de la información y la comunicación (TIC) desde una perspectiva sociocultural para comprender su aprovechamiento y para analizar los factores sociales que inciden en la apropiación tecnológica de jóvenes mayas de la Universidad Intercultural Maya de Quintana Roo (UIMQROO), los cuales, a pesar de que cuentan con experiencias escolares discontinuas en la adquisición de habilidades digitales, usan cotidianamente las TIC y las redes sociales como parte de la necesidad de pertenecer a la era digital.

Palabras clave: brecha digital, educación superior, iniciación a la informática, población indígena, tecnologías de la información.



Abstract

The digital divide is an inequality that is linked to other inequalities and affects populations living in poverty. Thus, most indigenous regions in Mexico have difficulties to connect, however, cell phone use has proliferated in rural areas in the last decade and young people are the most active users. This ethnographic study takes up the concept of social appropriation of Information and Communication Technologies (ICT) from a sociocultural perspective to understand the use of digital technologies and analyzes the social factors that influence the technological appropriation of young Mayans from the University Intercultural Maya de Quintana Roo (UIMQROO), which, despite having limited and intermittent school experiences in the acquisition and use of ICT, daily use ICT and social networks as part of the need to belong to the digital age.

Keywords: digital divide, higher education, digital literacy, indigenous people, ICT.

Resumo

A exclusão digital é um problema que está ligado a outras desigualdades e afeta as populações que vivem na pobreza. Assim, a maioria das regiões indígenas do México tem dificuldade de se conectar, embora o uso do telefone celular tenha proliferado na última década nas áreas rurais, onde os jovens são os usuários mais ativos. Este estudo etnográfico retoma o conceito de apropriação social das tecnologias de informação e comunicação (TIC) numa perspectiva sociocultural para compreender a sua utilização e analisar os fatores sociais que influenciam a apropriação tecnológica de jovens maias da Universidade Intercultural Maya de Quintana Roo (UIMQROO), que apesar de terem experiências escolares descontínuas na aquisição de competências digitais, utilizam as TIC e as redes sociais no cotidiano como parte da necessidade de pertencer à era digital.

Palavras-chave: exclusão digital, ensino superior, iniciação à computação, população indígena, tecnologia da informação.

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Introduction

Information and communication technologies (ICT) are a key element for human, social and economic development by offering opportunities for greater well-being and empowerment of individuals, organizations and societies (Boza et al., 2009). However, despite the fact that ICTs in society have reconfigured the forms of communication and global social participation reaching rural and indigenous populations, there has been a lack of equity in access and their use has produced new processes of technological exclusion. . This inequality that is articulated with other broader inequalities (Cobo et al., 2018) mainly affects individuals living in conditions of poverty and marginalization, which creates greater gaps that are difficult to reduce (Ministry of Communications and Transport [SCT], 2019).

In Mexico, a government commitment has been established to grant access to ICT (internet for all) in order to attack the problem of the digital divide, for which various efforts have been made in ICT policy, although still Significant connectivity challenges remain in rural areas, as well as digital literacy programs for all age groups, both in and out of school.

With regard to indigenous communities, there is a growing digitization of daily life (Winocur, 2015). Especially, it is young people who represent the most active users in Mexico (National Institute of Statistics and Geography [Inegi], 2020a).

With the arrival of intercultural universities as of 2003, which constituted a watershed in the access to higher education for indigenous young people from marginalized regions, they have positioned themselves as relevant community spaces in the socialization of this generational group and in the integration of cyberculture (Lévy, 2007), in addition to constituting higher education alternatives in indigenous regions.

The objective of this article, therefore, is to characterize the social factors that influence the technological appropriation of the Mayan university students of the UIMQROO, where the economic, technological, social and cultural conditions, as well as the previous educational trajectories and the perceptions about the ICT uses have significant weight. This research contributes to an analysis of the educational trajectories, the uses and meanings that young people give to various digital technologies in a context of social and digital inequality.

The document has the following structure: in the sub-section that makes up the introduction, digital inequality and indigenous peoples in Mexico are analyzed, the definition of ICT social appropriation is reviewed, and indigenous youth are placed in their integration

into the digital age. Subsequently, the methodology is stated. The results are presented based on the most significant findings of the study: digital divide and uses of digital technologies, educational trajectories and digital literacy, and significant uses of ICT and social networks. Finally, the discussion and conclusions are presented.

Digital inequality and indigenous peoples in Mexico

Few studies have been carried out to characterize the digital divide that affects indigenous communities in the world (Borrero, 2016) and in Mexico. Some of the studies on indigenous peoples and the digital age are those of Ramos Mancilla (2020), Soto-Hernández, Valencia-López and Rentería-Gaeta (2020) and Bonilla, Cruz and Pérez (2018). Regarding research on the use of ICT in indigenous higher education, Tipa (2019) and Ortiz and Alarcón (2014) evidenced the different inequalities that students present due to poor prior schooling in technological matters. Another study shows the digital divide in which the young people of the Ayuuk Higher Institute (ISIA) find themselves and the little technological literacy that teachers carry out (Vergara, 2015).

Tipa (2019) refers to the relationship between the socioeconomic stratum and the use of ICT at the Intercultural University of Chiapas (UNICH), where low-income students have greater difficulties in owning laptops and USB memories. Likewise, ethnolinguistic differences were found due to the fact that students who speak a mother tongue have fewer electronic devices and connect less to the internet and social networks.

As part of social inequalities, access to ICT is not possible for all people. Since 1995 - when the concept of the digital divide emerged (van Dijk, 2017) - three research periods can be identified: the first deals with physical access to technology. The second evidence that it is not enough to have access, but that it depends on the significant use of ICT. The third period integrates the results of the use of ICT and individual and collective benefits, where it is shown that people in more privileged environments have greater digital participation (Robinson et al., 2020).

It is estimated that in countries with higher levels of poverty, acquiring a technological device and connecting to the internet are more difficult than in developed countries. Thus, the global digital divide is characterized by affecting more rural, indigenous and poor areas, women, poor people with low education and older adults (Borrero, 2016).



Inequality in the access and use of ICTs is associated with different economic, geographical, social, cultural, linguistic, gender, educational and generational factors (Robinson et al., 2020). Some research highlights the relationship between poverty and digital inequality, where families with greater economic capacity have more access to ICTs (Sunkel, 2006).

In Mexico, the National Survey on the Availability and Use of Information Technologies in Households (Endutih) is the mechanism to obtain data regarding the access and use of ICT; however, it focuses on urban locations and includes a low percentage of the rural population in locations with less than 2,500 inhabitants (Inegi, 2020a).

It is relevant to note that neither the indigenous nor Afro-descendant population are included in the survey, so there is an important gap. Along these lines, in a 2018 study on technological use and indigenous peoples, carried out by the Federal Institute of Telecommunications (IFT), it is concluded that this sector uses a low-speed service (2G and 3G) (Federal Institute of Telecommunications [IFT], 2018).

Regarding the difference between rural and urban areas, it was found that while the internet connection of urban people oscillates between 76.6%, in rural areas it drops to 47.7%. The same happens with the availability of a computer, where 50.9% of rural inhabitants have one, and only 20.6% in rural areas (Inegi, 2020a).

The disparities observed in the data come mainly from deficiencies in technological infrastructure, marginalization, poverty (Inegi, 2020b) and low levels of schooling (Inegi, 2020a).

For example, while the population with higher education at the national level connects to the internet in 96.4%, those who only have primary education do so in 59.1% (Inegi, 2020a). The main reasons why the inhabitants do not have ICT are economic (Inegi, 2020b).

Finally, the population with the greatest digital gap is people over 55 years of age, which is worsened to a greater extent in the rural sector, where only 3.8% of adults in that age range use technology (Inegi, 2020b).

Regarding the policies that have been put in place to guarantee the constitutional right to use ICTs, various programs derived from the National Digital Strategy stand out, such as México Conectado or Agenda Digital Mx to strengthen infrastructure and provide the population with digital skills. . Unfortunately, there are few advances in closing the rural and indigenous digital divide (Soto-Hernández et al., 2020) because they have been projects

focused mainly on the urban population. The foregoing shows the little investment and the high levels of digital exclusion that the country has (Mariscal, 2020), especially in the field of education (National Institute for the Evaluation of Education [INEE], 2019).

In the case of the indigenous population in Mexico, the educational gap is greater compared to the non-indigenous population due to different deficiencies in terms of coverage, equipment, infrastructure, quality of education, training, among others. This in turn is related to the rural digital divide, poor education and high levels of poverty (Ministry of Communications and Transportation [SCT], 2019).

An example is the evident inequity in the distribution of computer equipment according to data from INEE (2019), as well as "the absence of federal or state policies or regulatory guidelines for the distribution of computers in the different types of service" (p. 233). The educational system presents a very important technological lag, where only in the 2017-2018 cycle, 46.5% of primary schools had at least one computer and 31.9% of indigenous schools had this service. At the secondary level, there is 74.9% nationwide. Regarding internet connection, 48.1% of public primaries have connectivity, compared to 13.4% of indigenous primaries and 5.5% of community primaries (INEE, 2019). Likewise, the few digital skills that teaching staff possess stand out.

Thus, the technological lag of the indigenous population is due to the fact that "this inequality is caused by conditions of economic, social and cultural vulnerability" (Bonilla et al., 2018, p. 72); For this reason, community projects for technological use advance slowly and with limitations, as these authors refer to with regard to the creation of content in indigenous languages in cyberspace.

Regarding current digital policy, with the government of Andrés Manuel López Obrador, the focus is on the rural and disconnected population, based on a priority program of the Ministry of Communications and Transport: Social Coverage, whose objective is to grant the access to ICTs for the inhabitants in the digital divide who are located mainly in the states that lag behind in technological matters at the national level: Oaxaca, Chiapas, Veracruz and Guerrero, through the provision of "internet for all" and as a measure to mitigate the poverty, "because access to these services is an integral part of the policy to achieve equity and social justice" (SCT, 2019, p. 5). In this sense, this is the first national program in history focused on addressing digital exclusion, so it will be essential to study its

evolution, as soon as the proposal that has been stopped by the pandemic caused by covid-19 is reactivated.

Social appropriation of ICT and indigenous youth

Even with the digital inequality of the context, young people make daily use of ICT and social networks in Latin America and Mexico (Crovi Druetta and López-González, 2011) according to their possibilities, and the case of indigenous youth is no exception.

One of the greatest successes of the reconversion of the media has been the digital social networks that emerge as a set of virtual technological platforms and mobile applications that allow users to interact, create and share visual and written content of a personal, relational nature. , political, emotional, etc. Some of the most popular are Facebook, YouTube, Instagram, WhatsApp, Twitter, LinkedIn, Tik Tok, among others. Currently, they are used by 50% of the world's population (Cooper, April 20, 2020) where young people excel.

These social networks are made up of friends, acquaintances, neighbors, relatives and other work networks. In turn, participation in networks influences the formation of a self-concept and a social projection that add to the need for recognition and group membership. Each social network establishes its seal and user niche where each participant creates their own social environment (Gallegos, 2016).

This mass phenomenon has passed through the daily lives of urban and rural young people because they participate in virtual society, resorting to fashion, music and other forms of cultural consumption. In Mexico, entertainment is the main activity on the internet and 87.8% declare that they are users of social networks (Facebook, WhatsApp, Twitter and Instagram are the most used) (Inegi, 2020a).

Thus, tradition and modernity intertwine and cultural consumption is adapted to the new times. In the case of indigenous youth, they take advantage of this relocation inherent in globalization, and appropriate ICTs and reconfigure identities (Pérez Ruiz, 2019) with a strong component of sense of belonging to the global movement and use ICTs as emblems of that digital culture based on its contextual conditions and its social assets.

Face-to-face socialization experiences are expanded with the virtual world (Lévy, 2007), at the same time that “they are reproducers and generators of an online reality parallel to offline reality” (Gallego, 2016, p. 33). On the one hand, virtual platforms serve as a means



of representation and exhibition of social imaginaries and, on the other, they configure and propose forms of grouping and social identification that include behavior patterns, practices, uses and consumption patterns (León-Pasquel , 2018).

Regarding the participation of these young people in the digital age, a new role has emerged as digital mediators (Hepp, 2009). For Pérez Ruiz (2019) they invert their position of subordination that the social structure has imposed on them because for the first time they are the ones who have greater digital skills to teach older people, and not the other way around, as has historically happened in other areas. .

For Bonilla et al. (2018), “young people reinvent technology through collaborative work, creative talent and through strategic alliances to consolidate a sophisticated combination of computer language and cultural code” (p. 72). These practices demonstrate how technological appropriation is possible in indigenous peoples. The social appropriation of ICT refers to the process in which people grant a beneficial use to them either individually or socially, depending on the sociocultural, economic, political, technological, educational, demographic and geographical conditions (Andrés, 2014) .

From a sociocultural perspective of technology, culture is a constitutive and constitutive dimension in the use of ICT (Meneses, 2019) because artifacts have a particular meaning (Lévy, 2007; Santos, 2003). In this way, ICTs affect daily life and shape social practices (Winocur, 2015).

According to Crovi Druetta and López-González (2011), social appropriation “takes place in a specific socio-historical setting in which the individual not only has access to them, but also has the skills to use them and they become so important for them. their daily activities (productive, leisure, relational) that become part of their social practices ”(p. 74).

Digital ability is conceived as the level of mastery that the individual possesses to handle ICT, which requires specific technical training. For van Dijk (2017) and Cobo et al. (2018), the appropriation of technologies is mediated by access and motivation in use, as well as digital literacy. Other determinants are schooling, socioeconomic position, gender, technological equipment, ethnic origin, and age, to name a few.

For Lévy (2007) in cyberspace, personal intelligence that precedes collective intelligence requires the primary acquisition of basic digital skills, but also a new literacy that provides the ability to classify and interpret information in a virtuality that overflows for its exponential growth and that includes misinformation. Thus, the selection of data becomes

essential. Collective intelligence is the central function of the digital age that the author identifies due to the possibilities that cyberspace houses as an open, socializing and participatory space.

Likewise, educational trajectories, motivations for use, and economic and social assets are aspects that are woven into the biographies of indigenous youth to access, use and appropriate ICTs, which will be discussed below. In other words, schooling is a key factor because it allows obtaining digital skills, but also the community conditions of infrastructure and equipment as well as family and friendship networks, which influence the use or non-use and motivate technological learning.

Methodology

The research was carried out at the Mayan Intercultural University of Quintana Roo (UIMQROO), located in the town of José María Morelos (JMM), which is located in the south of the state. This institution houses more than 700 students (mainly Mayans) who study one of the 10 educational programs¹ of more than 60 indigenous and rural communities surrounding the municipal seat of José María Morelos, both in Quintana Roo and Yucatán.

This ethnographic research (Guber, 2011; Velasco and Díaz de Rada, 1997) integrated an extensive bibliographic review on the topics addressed by the object of study for the construction of the state of the art, a conceptual reflection to elaborate the theoretical framework that takes an approach sociocultural and anthropological of the technology, an analysis of the sociodemographic and economic conditions of the study context and a fieldwork stage where empirical information was collected, taking as a basis key aspects proposed by the anthropology of education.

It is relevant to note that the value of ethnographic work in the field of education consists of recognizing the generic that is expressed in each case and describing an educational and social reality through field work, understood as a “place to live” (Velasco and Díaz de Rada, 1997, p. 105). This qualitative method allows us to understand the meanings of the cultural context where the phenomenon is inserted, trying to unravel the

¹ Licenciaturas en Salud Comunitaria, Lengua y Cultura, Turismo Alternativo, Gestión Municipal y Desarrollo y Gestión de las Artes. Ingenierías en Sistemas de Producción Agroecológicos, Desarrollo Empresarial y Tecnologías de la Información y Comunicación. Maestría en Educación Intercultural.

conceptions of the social actors that correspond to the emic perspective, to later cross it with the etic perspective, more of a structural and theoretical nature.

The field work was divided into two parts: in the first, a short stay was carried out with the purpose of managing access to the field and initiating the required trust-building process. This visit served to get to know the town of José María Morelos, the university and the academic staff to present the research and receive feedback regarding the objectives and the design of the data collection instruments. In the second stay, which lasted two and a half months in 2017, the interviews were applied and the focus groups were carried out. It is worth mentioning that daily coexistence becomes a crucial element that allows us to understand and unravel “the rules of social action” (Velasco and Díaz de Rada, 1997, p. 91) and the meanings of the phenomenon that the actors give in their cultural context.

The study combined the performance of 8 in-depth interviews with professors and 10 with young university students (students and graduates), as well as the execution of 6 focus groups with the collaboration of 37 students in total, and the participation in various academic events of the university as a gesture of reciprocity in the research process, which include master classes and the development of an instrument for evaluating digital skills for first-semester students in collaboration with the academic body of ICT engineering. In all cases, we worked under informed consent to respect the confidentiality of the participants. An additional element was the elaboration of the field diary that accumulated more than 100 pages of ethnographic description and participant observation.

The determination of the sample was according to a qualitative and intentional study, that is, the key actors of the research were considered, which was adjusted according to the first visit. In this way, the representativeness and availability of students and graduates of various university careers, as well as teachers and academics, were sought. Some characteristics of the students and graduates are that their ages ranged between 18 and 32 years, most of them belonged to indigenous communities in the south of Quintana Roo and Yucatán, and most of the participants spoke Mayan as their first language. Regarding the academic staff, essentially, subject professors from various careers and the academic director, who came primarily from the region, were interviewed.

Subsequently, the interviews and focus groups were transcribed, which were integrated into a documentary corpus of which a first coding was carried out through content analysis (Bardin, 1996) and the Atlas ti program was used. In a second moment, the empirical

categories and subcategories were refined and analysis documents were written (Restrepo, 2016). Finally, the “methodological triangulation” was carried out (Taylor and Bodgan, 1987), which consists of relating the main empirical categories and their multiple associations with the theories and concepts of the investigation.

Next, the results of three central aspects that were obtained from this analytical process are presented and that account for the factors that affect the technological appropriation of young university students: the uses of various digital technologies in a context of digital divide, educational trajectories and digital literacy processes, and finally the meanings of the use of ICT and social networks.

Results

The digital divide and the uses of ICT

José María Morelos (JMM) It is characterized by being a municipality with a high level of marginalization and poverty; It has about 39,165 inhabitants, of which 49.80% speak an indigenous language (Mayan with 99.6%). In addition, 2.17% of the inhabitants consider themselves Afro-descendants (Inegi, 2021, p. 21). The main economic activities are agriculture and forestry, followed by trade. In the last 20 years, thanks to the tourist boom in the Riviera Maya, a diverse population of the region has migrated, placing themselves in jobs in the hotel and restaurant sector in the area.

Regarding access to housing and health, 40.7% have piped water, 84.6% with drainage, 86.5% with sanitary service and 96.9% have electricity at home (Inegi, 2021, p. 21). In addition, the municipal seat has a health clinic.

In education, the Inegi in its last census records that 8.3% of the population has no schooling, 62.3% has basic schooling, 19.2% has completed upper secondary education and only 10.2% has access to higher education. In the municipal seat there are several primary schools, two secondary schools, a high school and the UIMQROO. Regarding the availability of ICT, the technological lag in this region is evident: 54.9% of households have pay TV, 15.2% have a computer, 71.9% have a cell phone and finally 19.7% have internet (Inegi, 2021, p. 21).

In recent years, the use of mobile Wi-Fi has increased through smartphones that access 2G and 3G, because most of the homes in the town do not have an internet connection

due to the lack of fiber optics on the part of telecommunication companies; furthermore, the connection is slow and continually saturated. In fact, satellite connections and local antennas operate mainly in the area, which not everyone can afford.

During the investigation, the following places with internet connection were identified: nine internet cafes, three restaurants, the municipal palace and the UIMQROO. Cell phones in the region have become more affordable, which is why they are common among the population. To connect to the internet, they buy data or connection tokens in small shops in some communities, although the quality of the network varies.

Regarding the infrastructure at the university, at the time of the research there was a room with 40 computers and the internet connection had a capacity of 10 megabytes of broadband for the entire university community, which was perceived as insufficient on the part of teachers, students and graduates: "The connection is very, very slow and that sometimes makes us fall behind when we want to do research" (interview with a Language and Culture student).

As a result of the study, young people - despite local conditions - use ICT as an essential means of information, communication and leisure. Furthermore, 60% of the students and graduates had a personal computer and 95% had a cell phone. For most, the cell phone has become an indispensable accessory: "My cell phone is my life, honestly, because everything is there: from photos, videos; He accompanies me everywhere "(Municipal Development graduate in focus group).

Regarding the Internet connection, the young people reported that this service can only be paid for by those who have greater economic possibilities: "Many times, here at the university, those boys sometimes don't even have enough to eat in many cases: ¿ How are they going to have to hire an internet service? " (interview with a professor of ICT engineering).

Approximately 95% of young people said that they used social networks, especially Facebook, WhatsApp, Twitter, Instagram and Snapchat. Likewise, in the school environment they are used to review school announcements, download and send assignments, share documents and communicate with the family or register in international groups where they learn Mayan collectively. Most of the young people indicated that they habitually used WhatsApp due to the low data consumption of said application. Instead, Facebook is singled out as the preferred means of communication for several hours a day and a week. The

activities that they carry out with average frequency are reviewing school assignments and watching videos and news: “Inform me what happens at the local level” (interview with an ICT engineering student). A relevant aspect was to observe that young people connect in different places:

Before having internet, I used to come here to the cyber to do my homework or even in the park, because they had put the internet in the park to do my work, because they put access points. But it is quite slow and sometimes as many go the network was saturated, you could not enter and when I came here to the university it is like to stay almost all night or come at dawn to be able to do a job (ICT Engineering student in a group focal).

Some students studying ICT engineering take advantage of their knowledge to use other local networks: "I have an application installed on my cell phone that detects access points and gives you the code of those who are vulnerable [laughs] and I can now connect" (ICT engineering student in focus group).

Due to the needs of the local people, young people collaborate in the repair of digital devices of colleagues, friends and family, and support them in teaching digital skills.

Educational trajectories and digital literacy

The technological precariousness previously described in indigenous education (INEE, 2019) was a constant pointed out by young people, as well as the scarce infrastructure and family economic difficulties. In fact, students and graduates indicated that their first contact with a computer occurred in secondary or telesecundaria, when they were between ten and twelve years old. A smaller group mentioned that they used this device in high school, followed by primary school as the educational level that provided them with access to ICT. It is even worth noting that a small group is just learning the basic tools during their stay at the UIMQROO, which shows an educational and technological lag.

The astonishment at the unknown and the emotion that the use of computers aroused in primary school were two recurring aspects that young people reported: “We were all amazed because we were already looking for a way to be able to use the computer in 5th grade” (interview with a graduate student in Agroecology).

In turn, they expressed that in basic education (indigenous schools) the technological equipment was insufficient. In addition, it is striking that technology was perceived as a

privilege in the educational levels they attended. For example, a graduate explained that in his elementary school computer classes were only for children who had influences with the principal, and that as he belonged to a humble family it was not possible for him to take those classes until high school, where digital learning was open to all.

This anecdote shows that not only access to digital technologies is determined by infrastructure, but also by local practices. That is, there are other factors (in this case of a political nature) that condition the use of technology (Andrés, 2014).

In addition to that, the young people told how computer classes were scarce or of low quality, which is why they obtained little learning in the school environment, so that visits to cybercafes became informal and self-taught spaces to develop literacy digital: “My colleagues were teaching me and watching tutorials. That is how I was learning to use it, I came from a very bad education ”(graduate of Municipal Management in focus group).

On the other hand, budget anxiety was a recurring aspect in the stories, as the students worried when they knew that they would not have a way to pay if the computer were to “break down” (Bachelor's degree in Municipal Management in focus group). Likewise, the role played by teachers in the motivational process of students towards learning is highlighted.

However, the trajectories on digital literacy were mostly identified as late, as difficulties were detected in the use of basic digital tools. From the results of the survey, it was perceived that the broadest knowledge was found in the use of basic packaging, and not so much in the use, for example, of Excel sheets, academic digital platforms and more advanced hardware actions and software.

According to the teachers consulted, this reality depends on the school where each student comes from. For the teachers, the students of the Center for Industrial Technological and Services Baccalaureate (CBTIS) are better prepared than those of the telebaccalaureate, which reveals the quality of the indigenous educational system that prevails in the locality: “I had already passed the baccalaureate and I had no idea how to use a computer, nor Word, nor Power Point, I was about 16 years old and did not know how to use it ”(graduate in Municipal Development in focus group).

These deficiencies are reflected in the entrance to the university, where the majority arrive with technological deficiencies, which is why the computer science subject was placed in the first semesters.

Faced with the different difficulties faced, the activation of support networks among colleagues and the digital literacy that is granted in the intercultural university are two important incentives. In this regard, a teacher commented: "They also rely on other boys, there they interact and make teams to do work and thus they also learn other things" (interview with a language teacher).

From the above, it can be inferred that technological lag has a close relationship with economic, educational and cultural factors (that is, belonging to an indigenous group), where marginalization and poverty affect the use and appropriation of ICT (INEE, 2019).

The significant uses of ICT and socio-digital networks

Social appropriation refers to the significant uses that people make of ICT, identifying individual and collective benefits. Therefore, it is relevant to know the perceptions of technologies, devices and potential uses, taking into account the global and local contexts (Feixa, 2014).

Likewise, in the set of technological artifacts and tools underlies a symbolic interpretation that —according to Pierre Lévy (2007) - corresponds to “a series of conceptions, representations around their invention, production and use: the techniques are carriers of projects , of imaginary schemes, of very varied social and cultural implications ”(p. 7).

For the young Mayans who participated in this study, technology and internet connection are recognized as a necessity in the development of the town, where the digital divide is a limitation that does not allow capitalizing opportunities: “Right now it is a community just in development, because There are countless projects so that the people are not left behind; technology is needed ”(ICT engineering student in focus group).

The benefits associated with the use of ICT are multiple, such as communication between people and communities, remote work, distance education, virtual procedures, electronic commerce, digital activism, social and political organization and revitalization. cultural and linguistic: “Lately they have been talking a lot about the revitalization of the Mayan language, I feel that the Internet is a way of how we can expand this information through pages, blogs (...). They are quite useful ”(interview with a degree student in Language and Culture).

Regarding the use of social networks, it was observed the great impact that they are having both in their forms of cultural consumption and in their daily practices, product of an intersection between the global and the local (Pérez Ruiz, 2019):

I feel that there is a very strong acculturation among young people, their habits have changed a lot; for example, they are on the cell phone and they are there physically, but mentally they are in something else. In matters of fashions where we follow them without thinking ”(graduate degree in Municipal Development in focus group).

Regarding Facebook, young people believe that it is a platform to communicate easily with friends and acquaintances, post photos and see what their contacts are sharing; likewise, it allows them to be informed and download books or videos. It even offers them the possibility of creating groups and communities on specific topics using both the Mayan language and Spanish.

Other potentials that they observe is the economic boost through projects such as ecotourism, commerce in the locality and the potential that the internet and social networks have as platforms for citizen participation, where political activism and the creation of citizen movements allow solving community problems:

It serves to demand rights that we have ... In the neighborhood where we were, we had run out of water ... We were sending messages to the Mayor's Office on Facebook to see what was happening ... So we were demanding and sending messages all the time, like a week they sent pipes of water (Bachelor's degree student in Municipal Management in focus group).

Discussion

The results presented show that in many localities access to ICTs is difficult due to the few economic possibilities and the lack of infrastructure in the region. This coincides with the main causes of disconnection exposed by Inegi (2020a) and that proposed by Sunkel (2006) regarding the influence of purchasing power and the access and use of new technologies.

In turn, it was found that the students who have a greater technological lag and have fewer digital skills come from poor families from communities far from the municipal seat. In addition, the Spanish language is perceived as another limitation in the learning of ICT

due to the fact that the classes are not taught in the mother tongue of the majority of the students of these populations. This finding coincides with the work of Tipa (2019), who explains that the linguistic factor is associated with the economic aspect in the acquisition of devices and digital literacy, so it is inferred that the digital divide especially affects poor and indigenous populations .

In this context of inequalities, it should be noted that the majority of young people from the UIMQROO consider that the use of the computer and the internet is essential for academic life, which is similar to that reported by Crovi Druetta and López-González (2011) in his research, although this has been developed with young urban university students.

Based on the reports of the research participants about their previous trajectories, a set of factors that affect the use and appropriation of technology were identified, highlighting the educational and technological lag in the regions of origin. In this sense, there is a close relationship with economic, educational and cultural factors due to belonging to an indigenous group, where marginalization and poverty affect the use and appropriation of ICT in a continuum of digital exclusion (Mariscal, 2020) . These results are consistent with what Ortiz and Alarcón (2014) and Tipa (2019) refer to on indigenous students, digital inequality and the technological lag of indigenous education in the country.

Despite discontinuous trajectories, students and graduates (especially from technological careers) act as technological intermediaries (Hepp, 2009) in the digital learning of family and friends, mainly with their parents and other older adults who do not have digital skills and which are the age group with the largest digital divide (Inegi, 2020b).

Regarding the meanings that young people give to the use of digital technologies, the use of social networks in their daily lives as part of a new digital culture stands out (Meneses, 2019), even though they do not always have the ideal conditions connectivity. At the same time, some benefits of the use of ICT stand out in the local and community environment. In this panorama, the appropriation of ICTs —according to León-Pasquel (2018) - is a reality where “the expansion of connectivity for the benefit of low-income sectors of the population also brings with it new literacy skills and technological skills” (p. 48), as well as different experiences of collective uses of ICT for community service.

Conclusions

This study yielded results on the factors that characterize the digital divide in an indigenous area of Mexico, but above all it shows a story about the dynamism that young Mayan university students activate to challenge it based on their educational, economic and social possibilities, as well as their the motivation to integrate into technology. It is worth mentioning that this group corresponds to a privileged sector that has accessed higher education, which in the country constitutes around 1%.

In addition, the research allowed to reveal the incidence of the local context in social appropriation through knowledge of the uses and benefits of ICT and social networks that students and graduates of the UIMQROO grant, as well as perceptions about digital technologies and potentials in individual and community development.

Regarding economic factors, the relationship between poverty and digital inequality that affects young Mayan university students is clear, a structural and historical situation that has not changed in decades. Regarding educational factors, the school trajectories in the acquisition of digital skills were analyzed, which are characterized by being different in each case, although the lack of school technological infrastructure, deficient digital literacy and extensive economic deficiencies are the common denominators. However, the new youth digital culture is taking hold with great force and young people generate connection and digital learning strategies where friendship networks, teachers and family members are a central support in learning digital skills.

It is worth mentioning that the late acquisition of digital tools is not an impediment for UIMQROO students to be connected and for them to act as digital intermediaries with their parents and grandparents or acquaintances. That is, although there are conditions of educational and technological lag, young people tend bonds of solidarity to contribute to community development based on ICT, emerging as digital facilitators.

Finally, the university is established as a space for digital socialization that encourages them to adopt technology where the opportunity to use ICTs to strengthen indigenous peoples and participate in digital culture appears.

Future lines of research

The study presented exposes the need to continue delving into the development of ICT use projects that students and graduates of the UIMQROO carry out in their communities to understand the type of digital skills that they activate and that are combined with intercultural competencies. At the same time, the relevance of understanding the meaning of the use of socio-digital networks in spaces that go beyond school and that affect the configuration of youth identities in rural and indigenous areas is glimpsed.

Finally, pending lines of study are identified to know the scenarios and challenges that arose in the virtual education proposals and learning communities that were launched as part of the covid-19 pandemic, which demanded the intercultural universities of Mexico the generation of strategies to continue the courses despite the precarious conditions of technological infrastructure and digital empowerment.

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