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paakat@udgvirtual.udg.mx

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## **Cybercafes as Instances of Public Access to Information and Coadjuvant in Closing the Digital Divide in Morelos, Mexico**

### ***Los cibercafés como instancias de acceso público a la información y coadyuvante en el cierre de la brecha digital en Morelos, México***

César Barona Ríos\*

<https://orcid.org/0000-0002-6534-6972>

Universidad Autónoma del Estado de Morelos, México

Maricarmen Abarca Ortiz\*\*

Universidad Autónoma del Estado de Morelos, México

Regina Arellano González\*\*\*

Universidad Autónoma del Estado de Morelos, México

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#### **Abstract**

This article presents the results of a research aimed at diagnosing the digital divide among users of cybercafes in Morelos (Mexico) in terms of access to Internet services (determinants) as well as the identification and management of information. For this purpose, a survey was designed and applied to 116 informants in 14 municipalities of Morelos. Results indicate that cybercafes function as access points to information, technological devices, and Internet navigation, thus reducing the

digital divide, particularly in rural areas. It was also found that cybercafes allow users to access several services, users attend to obtain printing services, carry out governmental procedures and information searches, which would not be possible without the existence of cybercafes.

### **Keywords**

Digital divide; strategic information searches; cybercafes.

### **Resumen**

*En este artículo se presentan los resultados de una investigación orientada a diagnosticar la brecha digital en la población usuaria de cibercafés en Morelos, en cuanto al acceso al servicio de Internet (determinantes) así como la identificación y el manejo de información. Para este fin, se diseñó y aplicó una encuesta a 116 informantes de 14 municipios de Morelos. Entre los resultados destaca que los cibercafés funcionan como puntos de acceso a la información, dispositivos tecnológicos y navegación por Internet, con lo cual contribuyen a disminuir la brecha digital, en zonas rurales. Se encontró también que los cibercafés cumplen diversas funciones, los usuarios asisten para obtener servicios de impresión, realizar trámites gubernamentales y búsquedas de información, actividades que no se podrían realizar de no ser por la presencia de los cibercafés.*

### **Palabras clave**

*Brecha digital; búsquedas estratégicas de información; cibercafés.*

### **Introduction**

The access and use of digital technologies are an unavoidable public policy agenda issue and if the aspirations to have a better country with sustained economic growth, a more egalitarian society, among other elements of the well-being of the population are no longer seen only as good intentions and instead, a public policy agenda is launched to take advantage of the information superhighway that is available today (SCT, 2020). In this area, significant progress has been made in terms of telecommunications service coverage, although it continues to be unequal in poor areas, most of which are in the rural sector (Suárez, 2019; SCT, 2020). What has been little explored about the problem of unequal access to technologies is the use of information, that is, learning to navigate a digital device is one thing, but using it to obtain information from primary sources is something else. Hereinafter we will refer to this problem with the term "digital divide" (Hargittai, 2002).

One level of the condition of inequality is the technological infrastructure, which affects more markedly the rural population. This means that the rural sector uses digital technologies and being left out of the information superhighway accentuates its vulnerability. Currently 70% of the Mexican population are Internet users (INEGI, 2022). Even so, inequalities persist, supplier companies cover urban populations but not rural ones, which represent a fourth of the country's population (Martínez, 2018).

No company, and now we say it with precise knowledge, no company by itself will be able to connect the country. It requires the cooperation of all the telecommunications companies and a very active part of the State because it is very evident that there are areas that are not going to be profitable for the companies and they cannot be condemned. Said David Pantoja Meléndez, general director of CFE Telecommunications and Internet for All (Barrientos, 2022).

Connectivity at home with broadband access is still not a reality for the poorest entities in the country, for which Internet access from cybercafes represents an alternative. Connectivity at home obtained from a cell phone with determinate capacity, for example for to send an e-mail, does not mean that the user has computer equipment for web sites for visualized images graphically complex (DiMaggio, Hargitai, Celeste and Shafer, 2004).

In addition, the Internet user is not a 100% autodidact, given that requires the guidance of colleagues or trained personnel. For these reasons although cybercafes is decreasing as mobile connectivity increases they are still a space for gathering mainly for young people.

Another level of the digital divide less studied in México corresponds to obtaining useful information. Coverage facilitates access, but this does not result in having reliable information, that's minds, if a user on Internet search a product for consumption there are many offers with the same sound, but the product is another thing or false.

The population that has more access to the Internet at home refers to the fact the expansion of coverage, as well as the penetration of digital media in homes, schools, commercial transactions, and recreation to mention some spheres of daily life. It will finally end certain inequalities at least certain tendencies of coevolution with education and income (DiMaggio, Hargittai, Celeste, and Shafer, 2004).

The research question posed in this article is the following: Do cybercafes contribute to closing the digital divide in terms of technological infrastructure and allow users to obtain information from primary sources? To answer this question, the research objective remains to diagnose the role of cybercafes in bridging the digital divide, both in terms of technological infrastructure and digital skills in municipalities of Morelos, Mexico.

## **Digital Divide, Determining Factors and Contribution of Public Access Sites with Cost (Cybercafes)**

According to data from National Survey on Availability and Use of Information Technologies in Homes ENDUTIH, by its acronym in Spanish, tabulates that the: "Internet users, according to places of access, 2015 to 2021" (INEGI, 2021) of Mexico was 88 562 249. Out of this total, 16.8% (14 863 269) of Internet users connected in public site with cost (cybercafe), a percentage higher than the connectivity in schools or educational institutions, which was 14.1% (12,448,085).

In a note from El Financiero newspaper (Rebolledo, 2017) it is mentioned that cybercafes became popular in the mid-nineties, in which the use of computer equipment, connectivity and bar or cafeteria services were offered. By 2002, 15% of Mexican Internet traffic went to a cybercafe. The connection peak was reached in 2006, with 39% of access and second place among the main access points (the first was the Internet at home). The turning point occurred in 2014.

A year earlier, in 2013, a reform in the telecommunications sector was carried out, resulting in the participation of more companies to provide telecommunications services that until then were exclusive to two private sector companies (Palacios, Flores-Roux and García, 2013; Ayala, Chapa and García, 2018). As of that year, domestic connections increased and migration to the mobile Internet took place, the latter helping to displace cybercafes, but they did not lose relevance.

Almost two decades ago, Torres (2003) mentioned that the increase in access to digital services at home would lead to the disappearance of cybercafes. However, this prediction has not materialized. While digital services and Internet access through cell phones have grown, cybercafes continue to exist due to limited connectivity at home. Additionally, cybercafes serve purposes such as socialization, recreational activities, and privacy. In many cases, users of cybercafes are not excluded from having Internet access at home.

According to Rueda (2005, 2008), the cybercafe serves as an important communication facility, and its face-to-face interaction with users distinguishes it from other sites that merely offer computer loan services with Internet access. This characteristic cybersafe that place for face-to-face service was initially identified by Wakeford (2003) in the study of two cybercafes in England.

The study by Gomez (2012) analyzes the role of three instances: libraries, tele centers and cybercafes as facilitators of information of the population. This study was conducted in 25 developing countries and recognizes a vibrant ecosystem of organizations and initiatives that support

public access in the countries studied. It is pointed out that each instance has something special to offer and concludes when these works together to share their knowledge and specialized resources, they can make an enormous difference in the well-being of the population.

Benítez, Moguillansky, Ponce de León, Aguerre and Fontecoba (2013) investigated how young people from popular sectors use the computer and the Internet. Through a survey applied to 300 users of Information and Communication Technologies (ICT) residing in two neighborhoods of La Matanza (Argentina) various issues related to the link of young people with digital technologies were investigated; 133 cases were regrouped into two categories: home users (49) and cybercafes users (84).

The authors concluded that home users have more frequent and extensive computer use and have more years of Internet experience than cybercafes users. Regarding the use of the Internet, home users develop a greater variety of online activities concerning cybercafe users, except for online games in which cybercafes users stand out; and home users stand out for the diversification of their knowledge in computer resources.

Dos Santos (2013) carried out a study that took two analytical axes: city and urban peripheries. Cybercafes are recognized as Lan-Houses (Local Area Network), differ from one city to another and from neighborhood to neighborhood, have become meeting places for young people to socialize, perform work activities, do homework and communicate. The author concluded that the territory is an adaptation in the insertion of the necessary elements for the use of the Internet and social aspects. He pointed out that analyzing technologies from a technical point of view, without their social implications, is to undermine the analysis, since the growing use of the Internet is rooted in the social web.

Pérez and Tinajero (2016) analyzed the situation in which cybercafes operate in Baja California (Mexico), specifically the role their geographic location and the services they offer play in developing digital skills. The authors documented indexes and international studies on Internet penetration, the evolution of uses among young people and adults, and complemented their study with interviews with owners and operators of 15 cybercafes with emphasis on the functions and the support offered to users to identify the predominant uses in establishments. They concluded that the daily functions and practices of the operators are in general "routine and limited".

The studies identified on a national and international scale share the concern of the issue of the digital divide at the level of individuals and its relationship with technologies (Torres, 2003; Rueda, 2005, 2008; Benítez,

Moguillansky, Ponce de León, Aguerre and Fontecoba, 2013; Pérez and Tinajero, 2016). It is also highlighted that the digital divide is a social and cultural problem (Wakeford, 2003; Dos Santos, 2013).

The approach underlying these studies corresponds to one of the waves of the digital divide, that of infrastructure. In the international arena, the study of the digital divide had been oriented to the technological-individual perspective, which goes hand in hand with the theoretical approach of human capital (with a hint of social capital). This perspective highlights studies of the determinants of the digital divide: age, sex, schooling, economic status and native language (Grazzi and Vergara, 2012; Nishijima, Macedo and Mori, 2017; Scheerder, Van Deursen and Van Dijk, 2017; Martínez, 2018; Tourdert, 2019; Martínez and Mora, 2020).

The determinants are independent variables, which, with the use of procedures for quasi-experimental investigations segment the user population by sociodemographic traits, mainly. A common denominator of these study methods is that they are based on surveys with representative samples of the population and techniques for data analysis that are processed with econometric models. An expression of this approach can be found in the study of determining factors of the digital divide, which is based on the ENDUTIH of the National Institute of Statistics and Geography (INEGI for its acronym in Spanish) (INEGI, 2021; Martínez, 2018; Tourdert, 2019).

The orientation of human capital faces a dilemma: a person may know how to turn on a computer and search for information, but this does not imply that the answers reflected these activities performed. This distinction between what is prescribed and what is performed made it possible to identify a different level of digital divide, which is oriented towards a more in-depth study of the digital skills (Hargittai, 2002).

Digital skills are not about the use of equipment or knowing how to navigate, these are activities embodied in the person, in their performance in specific situations which are interdependent on the context, not only technological but also - and above all - social and cultural. The emphasis is on learning more than on the condition of the digital divide. From this point of view, it does not matter so much how or where digital skills are acquired since they can be taught formally at school or informally at work or in civic life. The relevance of public access sites then lies in the fact that they can assume the role of learning environment (UNESCO, 2012).

This level reveals the seriousness of the digital divide that affects those who have access to digital technologies and adds to persistent conditions of inequality (DiMaggio, Hargittai, Celeste and Shafer, 2004; Alva de la Selva,

2015; Mariscal, Benítez and Martínez, 2016). The digital divide can be understood from different perspectives, but generally refers to the difference established between people, institutions, societies or countries with access to technology in general, and to the Internet of those who cannot. The reasons why it is not accessed are usually economic, age, gender, race, geographic location, among others (Cabero & Ruiz, 2017).

A rural place is defined by its relationship with agricultural activity and areas with a population of fewer than 2,500 inhabitants. On the other hand, an urban sector is defined by a population greater than 2,500 inhabitants, economic activities in the service sector, and industrial activities. An urban sector functions as a central point for economic activities, serves as a political capital, and concentrates state services (INEGI, 2022).

The inhabitants of the rural area engage in development activities that alternate between agriculture and a service-based economy, as is the case in Tepoztlan, Morelos. This population is considered rural in terms of land ownership, but it is also characterized as "modern", due to the population's skills to participate in definite cultural projects, as well as in political and economic projects of the government (Lomnitz, 2015). A reclassification would be necessary for future studies on the urban-rural gap to address issues of inequality that encompass cultural factors, social transitions, and vulnerability.

Currently, three waves of the digital divide are recognized: 1) technological infrastructure, which properly refers to having an Internet connection, including the necessary means for said connection such as devices, software, and peripheral equipment; 2) digital skills, the use of the Internet requires more than having the connection itself, since it is necessary to have skills to interact with keyboards, screens, programs, etc.; and 3) obtaining tangible benefits, which has to do with the ability to use the sources of the network for a particular objective, be it personal or professional, this includes decision-making, since the user must be critical and analytical (Van Dijk and Van Deursen, 2010, 2014; Van Deursen and Van Dijk, 2018; Gonzales, 2015; Van Dijk, 2017, 2020). This article addresses only the first two points of the digital divide.

## **Methodology**

The backbone of this study is a survey of cybercafes users. The online questionnaire contains structured questions in four groups: 1) sociodemographic data: age, sex, education; 2) technological infrastructure and Internet use: Internet access, time to connection at Internet, use of cybercafe; 3) information

sequences that do not imply the execution; 4) an execution question, where informants are asked to navigate in pre-established links to obtain information from the network.

For its design, the ENDUTIH of the INEGI was reviewed, a survey designed by a research group from Spain (Aguaded, Marín & Díaz, 2015), the TICómetro of the UNAM (Kriscautzky and Cabrera, 2015) and an applied survey in Culiacan, Sinaloa (Ruelas and Ramírez, 2008), with the expectation of finding the most adequate survey to measure the access and use of digital technologies by users of cybercafes in Morelos. For the design of this survey, the survey by Aguaded, Marín and Díaz (2015) was taken as the main background, prior permission was obtained from the authors. Some questions from Kriscautzky and Cabrera (2015) on security in the use of the Internet were used.

It was decided to submit each question to a new validation process to achieve a more compact version of the questionnaire (the first version of the questionnaire was 40 questions), without losing sight of internal patterns of the study phenomenon of cybercafes users. As a result of this validation, we got a 20-question survey.

The sampling criterion was convenience, non-randomized, and yes aligned with the research objectives. A total 116 users from 28 cybercafes located in 14 municipalities of Morelos were surveyed, distributed across 6 regions: Cuernavaca, Cuautla, and Puente de Ixtla (urban zones); Tepoztlan, Jonacatepec, and Tetela del Volcan (rural zones). However, is important to note that the typical distinction between rural and urban zones becomes problematic in the context of Internet services in Morelos.

The survey was mounted on the platform Survey Monkey (<https://es.surveymonkey.com/r/QG73PV2>). It was applied from April 16 to 20, 2018. It was self-administered in the presence of at least one member of the research team who was available to clarify doubts and resolve difficulties, but without supervising the answers of the informants. The average application time was 30 minutes.

The processing of sociodemographic data, connectivity and devices was carried out with normalized distributions. The search for information was realized using tables with simple distribution data or accumulated percentages event so the graphic data of correspondence (Arellano, 2021), but in this article the data are interpreted using multivariate parametric and nonparametric models. Binary logistic regression was used to obtain determinants (Martínez, 2018).

For the processing of question 20 (links about the Independence of Mexico), correspondence analysis was used (Phillips and Phillips, 2009). The



values of two categorical questions are distributed in pairs, but it is not based on a contingency table, but rather on the combinations of  $\chi^2$  of each category of the two questions represented in a proximity matrix.

## Results

### *Sociodemographic Aspects of Cybercafe Users*

In the table 1, it can be appreciated that the average age is 24 years. Three distribution ranges stand out: the prevailing one from 13 to 20 years; a second group from 21 to 30 years old; a third group from 31 to 61 years old. At the educational level, 42.2% have high school or equivalent, 24.1% secondary middle school, 21.6% bachelor's degree, 6.9% technical career, 2.6% primary education and 2.6% graduate school.

**Table 1.** Main Sociodemographic Data of Cybercafes Users in Morelos

Sociodemographic	Men	Women	Total
Number of informants	65 (56%)	51 (43.9%)	116 (100%)
Average age:	22.89 years	26.02 years	24.45 years
13-20 years	36	23	59 (50.9%)
21-30 years	19	13	32 (27.6%)
31-40 years	3	8	11 (9.5%)
41-50 years	5	2	7 (6.0%)
51-61 years	1	3	4 (3.4%)
Missing data	1	2	3 (2.6%)
<i>Subtotal</i>	<i>64 (56.6%)</i>	<i>49 (43.4%)</i>	<i>116 (100%)</i>
<b>Highest level of studies achieved</b>			
Primary Education	2	1	3 (2.6%)
Secondary Middle School	19	9	28 (24.1%)
Technical career	6	2	8 (6.9%)
High School or equivalent	28	21	49 (42.2%)
Bachelor's degree	9	16	25 (21.6%)
Graduate School	1	2	3 (2.6%)
<i>Subtotal</i>	<i>65 (56.0%)</i>	<i>51 (44.0%)</i>	<i>116 (100%)</i>
<b>What do you do for a living</b>			
Study	26	23	49 (42.2%)
Work	26	19	45 (38.8%)
Both	13	7	20 (17.2%)
None	0	2	2 (1.7%)
<i>Subtotal</i>	<i>65 (56.0%)</i>	<i>51 (44.0%)</i>	<i>116 (100%)</i>
<b>Zones</b>			
Urban (Cuernavaca, Cautla, Puente de Ixtla)	47	35	82 (70.7%)
Rural (Tepoztlan, Tetela del Volcan, Jonacatepec)	18	16	34 (29.3%)
<i>Subtotal</i>	<i>65 (56%)</i>	<i>51 (44.0%)</i>	<i>116 (100%)</i>

n= 116

Source: compiled by authors.

The table 1 shows that the users of the cybercafes from Morelos are young, high school students who study or work, only a quarter combine both activities regardless of sex.

Disaggregating the informants by the activity they realize, 44.2% study, 38.8% work, 17.2% study and work, and 1.7% answered "none". Distribution by areas, 70.7% are in urban areas, 29.3% in rural areas (this distribution is proportional to the distribution of inhabitants in Mexico: 75% of the inhabitants live in urban areas, and 25% in rural areas).

### *Internet Access and Use of Cybercafes Users in Morelos*

The digital access divide is one of the first situations that occur with cybercafes users, 38.8% do not have Internet access at home, 61.20% do have access. The digital access divide affects more than a third of users. The foregoing is aggravated, because Internet access will depend, as shown in table 2, on the possession of a computer. Indeed, only 32.8% of cybercafe users have a desktop computer, 67.2% do not. 49.1% of them have a laptop, 50.9% do not.

This condition of the lack of access, a third without Internet at home and more than half without a computer places of the users at a disadvantage that forces them to use cybercafe. In other words, people use the cybercafe for a "functional motivation" (Beranuy, Carbonell & Cova, 2016). This concept does not have a universally defined foundation in Psychology. It refers to the theory of self-determination which discusses extrinsic motivation: "In essence, extrinsic motivation refers to behavior where the reason for doing it is something other than an interest in the activity itself" (Deci and Ryan, 1985, p. 35).

As for the cell phone, 90.5% have it, 9.5% do not have it, 76.7% do not have a digital tablet, 23.2% do. Digital TV, 56.9% have it, 43.1% do not. The video game console 82.8% of users do not have it, 17.2% do. The fact that more than 90% of users have a cell phone does not mean that they have connectivity at home, because they do not necessarily have the computer equipment to get the Internet signal.

Let's now look at the connectivity service, devices, time spent on the Internet and use of cybercafe, introducing the variables in a binary logistic regression model. The dependent variable is Internet service. Table 3 presents the results of the model with the independent variables refined in the iterations.

**Table 2.** Technological Infrastructure of Cybercafe Users in Morelos

Technological resources	Subtotal	Men	Women	Total
<b>What services do you have at home?</b>				
Internet	No	29	16	45 (38.8%)
	Yes	36	35	71 (61.2%)
	Subtotal	65 (56.0%)	51 (44.0%)	116 (100%)
Landline phone service	No	34	23	57 (49.1%)
	Yes	31	28	59 (50.9%)
	Subtotal	65 (56.0%)	51 (44.0%)	116 (100%)
Pay-Tv service	No	32	23	55 (47.4%)
	Yes	33	28	61 (52.6%)
	Subtotal	65 (56.0%)	51 (44.0%)	116 (100%)
<b>Electronic devices you have</b>				
Desktop computer	No	42	36	78 (67.2%)
	Yes	23	15	38 (32.8%)
	Subtotal	65 (56.0%)	51 (44.0%)	116 (100%)
Portable computer (laptop)	No	37	22	59 (50.9%)
	Yes	28	29	57 (49.1%)
	Subtotal	65 (56.0%)	51 (44.0%)	116 (100%)
Cell phone	No	5	6	11 (9.5%)
	Yes	60	45	105 (90.5%)
	Subtotal	65 (56%)	51 (44%)	116 (100%)
Tablet	No	51	38	89 (76.7%)
	Yes	14	13	27 (23.3%)
	Subtotal	65 (56.0%)	51 (44.0%)	116 (100%)
Digital TV	No	20	30	50 (43.1%)
	Yes	45	21	66 (56.9%)
	Subtotal	65 (56.0%)	51 (44.0%)	116 (100%)
Video game console	No	51	45	96 (82.8%)
	Yes	14	6	20 (17.2%)
	Subtotal	65 (56%)	51 (44%)	116 (100%)
<b>Internet connectivity (total time including cybercafe´s)</b>				
Just a few minutes	(1)	5	4	9 (7.8%)
Half an hour	(2)	5	8	13 (11.2%)
1 to 2 hours	(3)	28	15	43 (37.1%)
3 to 5 hours	(4)	12	7	19 (16.4%)
5 to 8 hours	(5)	10	6	16 (13.8%)
Up to 10 hours	(6)	5	11	16 (13.8%)
	Subtotal	65 (56.0%)	51 (44%)	116 (100%)
<b>Internet connection frequency from a cybercafe</b>				
1. Once a week	(1)	29	26	55 (47.4%)
2. 2 times a week	(2)	22	9	31 (26.7%)
3. Diary	(3)	14	15	29 (25.0%)
Missing data			1	1 (0.9%)
	Subtotal	65 (56.1%)	51 (43.9%)	116 (100%)

n= 116

Source: compiled by authors.

**Table 3.** Determining Factors of Internet Use in Users of Cybercafe in Morelos

Dependent variable: Internet service (0=No, 1=Yes)	B	Wald	Exp ( $\beta$ )
Landline	2,351***	12,768	10,499
Pay-Tv	1,513**	4,615	4,542
Tablet	1,646*	3,028	5,187
Desktop computer	3,003**	9,269	20,151
<i>Portable computer (laptop)</i>	<i>3,053***</i>	<i>12,440</i>	<i>21,182</i>

\* $p \leq 0.10$ , \*\*  $p \leq 0.05$ , \*\*\*  $p \leq 0.001$

Note: Age is not a determining factor for having Internet service, nor is dedication, level of education, sex or time spent using the Internet, therefore, these independent variables were excluded from the regression model.

Source: compiled by authors.

The variables that are included in the model, considering their significance and the exponential of the  $\beta$  value which is the number of times that the independent variable represents the  $\beta$  value in the regression. The determinants in Internet access are, first of all, the laptop (exponential value  $\beta$  of 21,182), in second place the desktop computer (exponential value  $\beta$  of 20,151), in third place the landline telephone (exponential value  $\beta$  of 10,499), Pay-Tv (exponential value  $\beta$  of 5.542) and the digital tablet (exponential value  $\beta$  of 5.187).

The cell phone was excluded from the model, because the number of users who do not have it (or who do). It has a distant correlation to the cut-off value of the regression which is 0.500. If the correlation is lower (if the variables "Internet service" and cell phone are taken, the Pearson's Correlation Coefficient is  $\leq 0.100$ , not significant) it does not reach sufficient representation to approach the cut-off point, instead, the other devices do achieve a distribution of at least 23.3%.

From the point of view of a normalized distribution of cybercafe users, with the variables excluded from the model, the *optimal access* to the Internet is achieved with the laptop. The result is not contradicted, because predicted values are obtained in the model where the data is prevented from being affected by low internal correlations. On the other hand, the model allows to identify precisely the conditions that imply the lack of *adequate connectivity*.

If the "frequency of Internet use", question 8 of the survey: "How much time do you spend on the Internet daily, both inside and outside the cybercafé?". This variable is introduced in the regression model, it appears as

a determining factor, which is logical because the more the users are connected, the greater benefits are appreciated, but when introducing the "frequency of Internet connection from the cybercafe", the connectivity time is excluded in the interactions.

However, if the model considers the Internet connection time from cybercafes and contrasts it with those who connect once a week, it yields a  $\beta$  value of 11.5515, neither the Wald value nor the exponential of the value of  $\beta$ , the reference parameter "0" is equal to "connection once a week", the value is significant at 95% confidence (table 4).

**Table 4.** Determining factors of internet use in cybercafe users in Morelos (internet connection from a cybercafe)

Dependent variable: Internet service (0=No, 1=Yes)	$\beta$	Wald	Exp ( $\beta$ )
Internet connection from a cybercafe (Once a week)	-	8,552	-
Internet connection from a cybercafe (Twice a week)	-1 326*	2 889	.265
Internet connection from a cybercafe (Daily)	1 724*	3 715	5 608
The location of the cybercafe is in a rural or urban area (Parameter 1=urban area)	1 551**	4 164	4 718

\* $p \leq 0.10$ , \*\*  $p \leq 0.05$

Source: compiled by authors.

If connectivity from the cybercafe is done twice a week, the Wald value is 2.889, the  $\beta$  value is 0.326 (compared with connection once a week), significant at 90% confidence and an exponential of 0.265. If the connectivity from the cybercafe is daily, the difference is obvious. The Wald value is 3,715, the  $\beta$  value is 1,724, significant at 90% confidence (it is contrasted with the parameter 0 = "Once a week") the exponential  $\beta$  is 5,608 times with respect to connecting once a week.

With these data, cybercafe have the greatest contribution in two aspects: the devices they do not have (in this case the computer) and the frequency with which they connect to the Internet per week. The relationship between connectivity and the lack of computer equipment reveals that the connectivity

of Internet users at home, in the best of cases, is carried out by telephone, but not for processing textual, numerical information or multimedia.

As regards rural and urban areas also shown in Table 4. The reference value (1) is assigned to rural areas, the  $\beta$  value is -0.947, the reference value for urban areas is (0). This would indicate less access for users in rural areas with an exponential value of  $\beta$  of 0.388, this makes clear the disadvantages of users in rural areas compared to urban areas and, on the contrary, the vital role played by Internet access from cybercafe in rural areas.

The browser used is considered. The main one is Google Chrome. The use of email less than half of the users use it due to that it has been incorporated into a social network such as Facebook, Pinterest, Instagram and Twitter. A similar situation occurs with file sharing. This activity is carried out with WhatsApp, Messenger or Facebook, and security measures in Internet browsing, that is, they handle cyberspace with relative fluency, but not necessarily because of the in-depth knowledge of the platforms which they have access, but because of the determinations of the devices used, which are PC in its almost totality, Windows operating system, pre-installed browsers such as Google Chrome, and social networks such as Facebook and WhatsApp.

But digital skills go hand in hand with the use of browser. For this purpose, three questions were raised to explore whether the tools fulfill a task of obtaining of primary source information: a) obtaining the CURP; b) Information search strategy; c) consultation of pages on the Independence of Mexico. The principal reason for selecting three questions at not only one, is the difficulty to measure the digital skills at declarative level.

#### *Digital Skills: Obtaining Primary Source Information*

a) Obtaining the Unique Population Registry Code (CURP for its acronym in Spanish)

In the question about searching for the CURP, informants were provided with an image with three links (figure 1) to carry out the query.

The three response options allow us to get the CURP, but each one implies different characteristics. The purpose was to know the ability of informants to discriminate which page they would select by reading the URL links (Uniform Resource Locator).

A reprocessing was done in the database. The "consisa.com.mx/curp" page was renamed "Associated with another site", because concise is from a third-party

supplier. For the “curp-gratis.com.mx/consulta-curp” page, it was renamed as “Advertising”; the page can be found advertised on different websites.

**Figure 1.** Response options for league identification with valid CURP URL

- 1 [Consulta tu CURP gratis en línea | Consisa](https://consisa.com.mx/curp) ✓  
[consisa.com.mx/curp](https://consisa.com.mx/curp) ▼  
 Consulta tu RFC y **CURP** en línea de forma sencilla y gratuita  
 Seguro Social NSS
- 2 [Consulta tu CURP gratis](https://www.curp.gratis.com.mx/consulta-curp) ✓  
<https://www.curp.gratis.com.mx/consulta-curp>  
 Si quieres consultar la CURP por Internet gratis aquí
- 3 [Consulta CURP](https://consultas.curp.gob.mx/) ✓  
<https://consultas.curp.gob.mx/> ▼  
 La impresión de la constancia CURP en papel bond  
 Administración Pública. Calle Londres No. 102, Pla  
 06600. Ciudad de México. Teléfono 01 800 911 11  
 (01/02/2018)

Source: compiled by authors.

Finally, “consulta.curp.gob.mx/” was re-labeled as “Official with manifesto” because it is the page of the Mexican State that allows printing the seal of the Ministry of the Interior. 60.4% of the informants selected the official site to identify for the CURP. This shows that users distinguish between a reliable web page from others that go through advertising, but the difference, 39.6%, do not filter the site for use information. These results are independent of age, gender and level education.

## b) Information Search Strategy

One of the most important aspects of using information is conducting proper online searches. In other words, it involves following an ideal set of steps to find the desired information. To explore this further the informants were asked about their information search strategies on the Internet, focusing on plausible sequences of actions defined for the research team.

The expected result that the search complexity corresponds to the highest level of schooling is not achieved. Some informants with a bachelor’s degree have a “basic search” –not related to primary source information–, while informants with secondary middle education appear with an “advanced search” –relied to primary source information–. This situation could be explained by the limitation indicated in the methodology, that it is not the same to ask a user

about their declarative capacity than to ask a hypothetical situation to explore their search performance.

c) Consultation of Pages on the Independence of Mexico

To go beyond the declarative question, a query was formulated that implied its reading: "Enter the links that are presented with information on the Independence of Mexico...". Unlike the previous questions, in this one it was asked to check pre-selected pages chosen at the discretion before the survey. To process the results, the links were subjected to a posteriori validation through expert judgment based on the criteria developed by Barrera, Núñez and Motola (2006). Based on this judgment, the variables were recoded to establish the quality levels of the information consulted (table 5). In the first place, the academic portal of the College of sciences and humanities (CCH by its acronym in Spanish) appears (35.5%); in second place is the link of "Cultura colectiva" (31.2%); in third place is Wikipedia (23.9%) and in fourth place is the "Rincón del vago" (9.4%).

**Table 5.** Evaluation for the Processing of Links on the Independence of Mexico

Link name	Internet browsing tools	Values	Hierarchy
	Web page		
<b>Rincón del vago</b>	<a href="https://www.rincondelvago.com/informacion/independencia-de-mexico/">https://www.rincondelvago.com/informacion/independencia-de-mexico/</a>	0	Nothing suitable
<b>Cultura colectiva</b>	<a href="https://culturacolectiva.com/historia/independencia-de-mexico/">https://culturacolectiva.com/historia/independencia-de-mexico/</a>	1	Little adequate
<b>Wikipedia</b>	<a href="https://es.wikipedia.org/wiki/Independencia_de_M%C3%A9xico">https://es.wikipedia.org/wiki/Independencia_de_M%C3%A9xico</a>	2	Acceptable
<b>Academic portal College of Sciences and Humanities (CCH)</b>	<a href="https://portalacademico.cch.unam.mx/alumno/historiademexico1/unidad4/independenciaMexico">https://portalacademico.cch.unam.mx/alumno/historiademexico1/unidad4/independenciaMexico</a>	3	Adequate

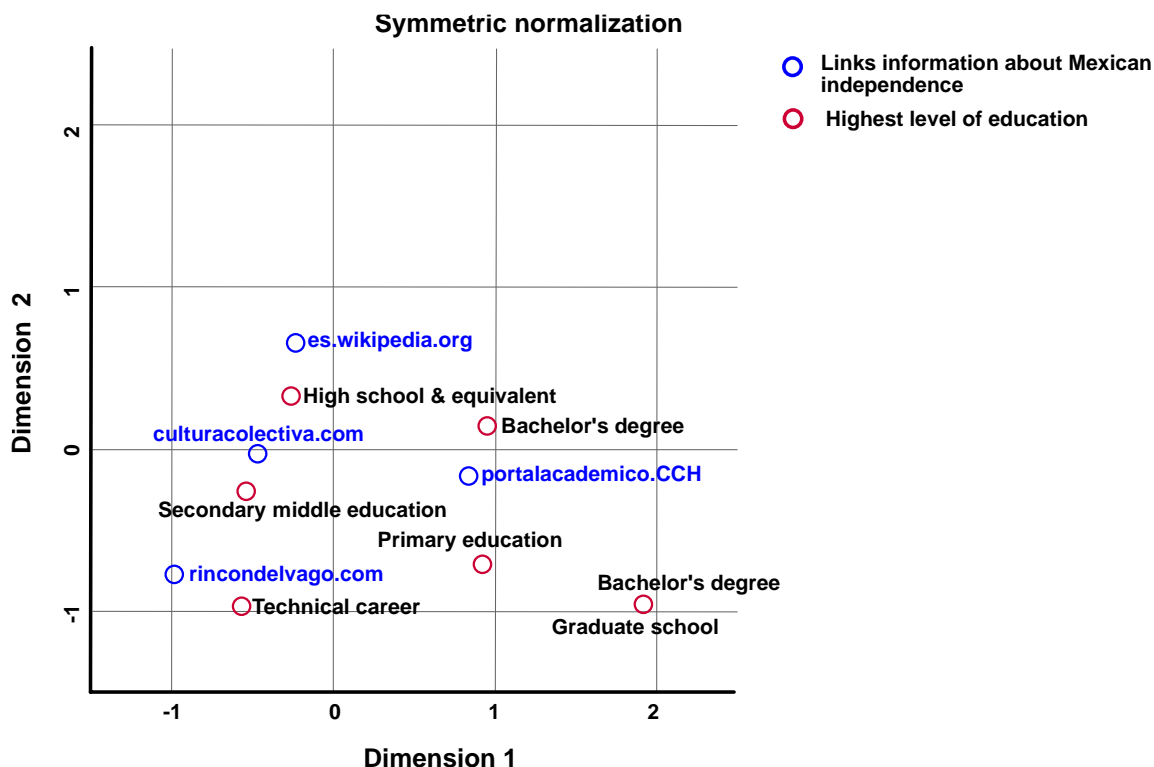
Source: compiled by authors.

Unlike the questions addressed to the informants where they are asked to choose images or instructions, in this part, they are asked to perform a task, access the links, read a topic and answer according to the reading. Figure 2 shows the positions of the websites in relation to the highest level of education to determine whether the use of cybercafes is general or a pattern of obtaining quality information.



It is striking that the primary education group is found at this level of discrimination in terms of information quality. This is because the informants are people over 15 years of age (extra-age): one of them is a 16-year-old woman who studies primary education, and another is a 33-year-old man who work (two participants).

**Figure 2.** Correspondences between the links of the Mexican Independence and the highest academic level



Source: compiled by authors.

This result confirms that cybercafes are a space that promotes information management in relevant contexts for life and work, in other words, here the cybercafe functions as a “learning environment” (UNESCO, 2012), that is:

[...] the complete physical, social and pedagogical context in which learning is intended to occur. The term most often refers to school classrooms but may include any designated place of learning such as science laboratories, distance learning contexts, libraries, tutoring centers, teachers’ lounges, gymnasiums and non-formal learning spaces. The components and attributes of a learning environment are conceptualized in relation to their impact on learning processes and outcomes in both cognitive and affective domains. This term may also refer to the natural environment surrounding school buildings when they are used as a learning space (UNESCO, 2012, p. 12).

The concurrence is determined by the highest level of studies reached for a bachelor's degree, with users who study primary education and who work, respectively. Two of the three primary education users in the study do not have Internet service at home, under these circumstances, to get information for their studies or work could not be achieved apart from cybercafes.

The second level of quality in the information is Wikipedia (score of 2), its position is close to high school or equivalent. It is striking, in contrast to the first correspondence, the distance it has from the academic portal. This group includes the population that attends school, and it is inexplicable that precisely at this level quality information is far from references in accordance with the school context.

"Cultura colectiva" (score of 1) is close to secondary middle school. The proximity of the categories is not the same as a question in an exam on the Independence of Mexico, due to the setting of more privacy and a less structured environment than that of the school, the fact that this league is selected for consultation in middle school leaves see an access with little information richness, probably fast reading, far from consulting better quality information, such as Wikipedia and the academic portal.

"Rincón del vago" (score of 0) is an "inappropriate" site and close to a technical career. The information is not even from History, but from dates, which is a very poor way to understand events or concatenated processes of the country's reality, in addition to the fact that the environment in which the information is presented is practically advertising and other people's homework copied and pasted as it is in this website.

With this information we can say that the atmosphere of the cybercafe is not a passive instance, it encourages the user to go beyond being a client who comes to check his mail or use social networks. What makes the cybercafe a particular environment is the *synergy* that is unleashed when exploring the potential of what can be done. The cybercafe user comes to search information, but something else can be brought and that is the recreation in the task of the potential learning trigger of the interactivity of the Internet in the public space.

## **Conclusions**

Do cybercafes contribute to closing the digital divide in technological infrastructure and allow users to obtain quality information? The answer to the research question is yes. Without the presence of cybercafes, the user population would have no other way of accessing the Internet service and, in addition, there would be fewer opportunities to expand quality information consultations.

Specifically, do cybercafes contribute to closing the technological infrastructure lack? 38.8% of respondents indicated that they do not have Internet service at home, this situation determines that all those who do not have this service the cybercafe is the principal alternative to access to Internet.

It is not possible to separate the users who only connect through the Internet service at home, because all the informants were surveyed in cybercafes, but what is illustrative is that 27.8% of the informants with service of Internet in house visit these places more than once a week. The informants who use cybercafes less than once a week are probably a group of occasional users. If we add the two cases: those who go to the cybercafe, but do not have Internet service at home and those who go frequently but have Internet at home; the cybercafe is relevant for 67% of the respondents.

In terms of digital devices, 50.9% do not have a laptop computer, 67.2% do not have a desktop computer, and 76.7% do not have a digital tablet, while 90.5% have a cell phone. Based on this data, if cybercafe users have a cell phone they may only visit the cybercafe as occasional users if their Internet access needs can be fulfilled with their own devices. However, this perspective can be misleading as it equates having Internet access for basic device functionality, neglecting activities such as web sites graphically complex. It is important to note that having individual devices does not necessarily translate to better access conditions.

Do the informants need additional devices such as desktops, laptops, or tablets, in combination with Internet service? While the cell phone is not excluded, its role becomes more secondary when compared to other devices. The ideal environment for participants would involve a combination of a PC with Internet access, a screen, and headphones, but there may still be limitations such as slow broadband at home that could be slightly improved at the cybercafe. The main difference between the environments lies in the interaction with other users and the availability of privacy for activities.

The above situation is favorable if, together with the frequency of use, respondents are in urban areas (Cuernavaca, Cuautla and Puente de Ixtla) than in rural areas (Tepoztlan, Jonacatepec and Tetela del Volcan). The condition of unequal access is accentuated by the digital divide in infrastructure and Internet access in general and in this study, which certainly puts informants from rural areas at a disadvantage, but this condition also works against nearly half of the informants from urban areas.

The condition of disadvantage is palpable in the first level of the digital divide, but does the technological infrastructure divide has an impact on

obtaining quality information? The data obtained by the survey do not show important differences if we consider the use of the browser, or search for information. In general, these aspects of information management can be classified as "adequate" in more than 70% of users. But the above was identified by prescribed questions, in which informants were not required to perform a task as close as possible to real situations.

When respondents were asked to perform a thematic search on the Independence of Mexico and were offered four alternatives to complete the activity, the object changed. The navigation could no longer be classified as "adequate", but rather nuanced and with a correspondence between the link chosen and the level of schooling. What the correspondence analysis shows is that the links with information to copy and paste, such as "Rincón del vago", is used for informants of the technical career, secondary middle education frequent "Cultura general". The link that involves editing content, "Wikipedia", is utilized for informants with high school and the academic link of "CCH of the UNAM", which is with structured content, corresponds to higher education, but also with elementary education.

If the results for obtaining quality information were correlated with the level of schooling, the result would be like that reported in the studies reviewed. The cybercafe is a routine type of instance, useful for search information. This line of interpretation cannot be sustained by the group of informants with primary schooling who study as adults or who work and only have this level of schooling. For this group, although small in comparison to the bulk of informants found to be schooled, the cybercafe offers tools that they would not be able to obtain without the contribution of learning environment found instead in cybercafes.

## **Recommendations**

Three recommendations emerge from this study. First, cybercafes need greater visibility as contributors to bridging the digital divide at the user population level, both in rural and urban areas considering, as about mentioned, the inequality condition.

Second, to promote the training of operators or owners of cybercafes this aspect is of utmost relevance, because the repertoire of them is expanded in the management of software or platforms, users will have a wider menu to make queries or obtain quality information.

Finally, encourage schools to establish closer ties with cybercafes, beyond being seen as stationery stores that rent computers. The cybercafe can function better if it is planned as a learning environment.

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\* César Barona Ríos. Profesor investigador de tiempo completo del Instituto de Ciencias de la Educación de la Universidad Autónoma del Estado de Morelos, México. Doctor en Educación, especialista en política educativa, evaluación institucional y procesos educativos. Miembro del Sistema Nacional de Investigadores del CONACyT. Perfil PRODEP. Correo electrónico: [cbarona@uaem.mx](mailto:cbarona@uaem.mx)

\*\* Maricarmen Abarca Ortiz. Profesora de tiempo completo de la Facultad de Psicología de la Universidad Autónoma del Estado de Morelos, México. Doctora en Educación, especialista en procesos educativos y análisis de información. Correo electrónico: [maricarmen.abarcaoub@uaem.edu.mx](mailto:maricarmen.abarcaoub@uaem.edu.mx)

\*\*\* Regina Arellano González. Asistente técnico de nivel superior de la Facultad de Psicología de la Universidad Autónoma del Estado de Morelos, México. Doctora en Educación, especialista en alfabetización y competencias digitales; ha participado en la gestión y diseño de planes de estudio. Cuenta con experiencia en la docencia y la administración escolar. Correo electrónico: [regina.arellanoq@uaem.edu.mx](mailto:regina.arellanoq@uaem.edu.mx)