Muestreo virtual online basado en redes sociales para localización de teletrabajadores como participantes de un estudio realizado en Victoria de Durango, México

Online virtual sampling based on social networks to locating Teleworkers as participants in a study conducted in Victoria de Durango, Mexico

Luis Miguel González García*
Cátedras CONACyT (Instituto Tecnológico de Durango)

José de Jesús Sosa Hernández**
Instituto Tecnológico de Durango

Santiago David Fierro Martínez***
Instituto Tecnológico de Durango

RESUMEN

Como parte de un proyecto investigativo en el cual se pretende estudiar las características sociodemográficas de las personas que realizan teletrabajo en Victoria de Durango (o Ciudad de Durango) resultó indispensable localizar personas que se desempeñen actualmente como teletrabajadores[i] y que además sean residentes de esta ciudad, lo cual es el objetivo de este trabajo. Los primeros intentos de localización de este tipo de trabajadores se llevaron a cabo con métodos convencionales, y el resultado no fue satisfactorio, por lo cual a partir de la revisión literaria se identificó que este grupo de personas tiene características de muestra oculta y que, por tanto, la herramienta adecuada como método de localización de estos participantes fue el denominado muestreo virtual en línea. Para este fin se utilizó la red social Facebook y se empleó como la herramienta metodológica denominada bola de nieve virtual, se aplicaron algunas pruebas piloto y dos campañas abiertas restringidas a la ubicación geográfica de Victoria de Durango, resultó un grupo de más de 13 mil personas que contestaron y 23 teletrabajadores localizados, con lo cual se pudo establecer un factor numérico que ayudó a calcular un universo aproximado de teletrabajadores en la Ciudad de Durango, esta información fue de utilidad para las posteriores fases del estudio integral.

ABSTRACT

As part of a research project that aims to study the sociodemographic characteristics of people who perform Teleworking in Victoria de Durango, it was essential to locate people who are currently working as Teleworkers, and who are also residents of the city before mentioned, which is the objective of this work. A first attempt to locate this type of workers were carried out with conventional methods, but the result was not satisfactory, so, from the literary review, it was possible to identify that, this group of people have hidden sample characteristics, and therefore the appropriate tool was the so-called on-line virtual sampling as a method of locating called participants. For this purpose the social network Facebook was used as a methodological tool called Virtual Snowball, applying some pilot tests and two open campaigns restricted just for the geographic location of the before mentioned city, resulting in a group of more than 13.000 people who answered and 23 localized teleworkers, with which it was possible to establish a numerical factor that helped to calculate an approximate universe of teleworkers in the City of Durango, this information being useful for the subsequent phases of the integral study.

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INTRODUCTION

This paper represents the first phase of an exploratory research project aiming at finding some characteristics of those people that carry out their daily work under the telecommuting[ii] scheme; therefore, it is essential to locate some of them in order for us to subsequently carry out a series of interviews with this kind of workers.

This group of workers must reside in the city of Durango, Mexico, place where this study is being conducted. Given the characteristics of this group, it can be considered a hidden sample since the information is scarce or even null and there are no entries in official databases such as those of the National Statistics and Geography Institute (INEGI, [Spanish acronym]).

By exploring the literature we acknowledged that this collection problem is one of the main difficulties the researcher faces at the moment of posing the methodological design and at the same time, we discover through the use of social networks it is possible to access observation units that would not have been detected through institutional channels (administrative registries, census, etc.). There is evidence that this type of tools contributes to increasing the geographical scope and the size of the sample besides promoting the design of the qualitative sample and the results triangulation which increases the validity of the studies of hidden populations (Salganik and Heckathorn, 2004).

Online Sampling

The progress of information technology has facilitated the study of hidden populations. The use of online techniques is observed in the data collection phase mainly (*online* questionnaires, *Internet*-mediated interviews, recordings and participating observation filming techniques). Some authors point out that the response rate of the *online* studies depend on the personalized contact strategies, the interest of the individuals in the topics addressed, the incentives and survey length as well as the technical factors. However, in many research fields, it can be a powerful instrument to improve the scope of the studies, maximize the relation time-cost and increase the size of the sample. New sampling methods have tried to mitigate the effects that the sample no-representation may mean and get as close as possible to more representative samplings of the minorities on which we are working (Couper, 2000).

Online Sampling Methods

The time-space sampling should be highlighted among those new methods (Magnani, Sabin, Saidel and Heckathorn, 2005; Semaan, Lauby and Liebma, 2002; Stueve, O'Donnell, Duran, Sandoval and Blome, 2001). We carried out a sampling based on the place of encounter (Muhib *et al.,* 2001), and the Respondent Driven Sampling (RDS) (Heckathorn, 1997, 2002, 2007). RDS more specifically is a sampling strategy especially designed for cases in which the sampling framework or the size of the universe is

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unknown; hence, its usefulness in working with hidden populations (Heckathorn, 1997, 2002).

Similarly to other chain sampling methods, the RDS begins with the recruitment of a limited number of seeds and it expands progressively into "waves" of pair recruitment. The seeds recruit only in the first wave; those recruited in said wave take the responsibility in bringing in new participants in a second wave and so on. All those recruited are people with whom the recruiter had a previous relation, that is, they are part of their social networks (Magnani *et al*., 205). This method has had such a development that to carry out this procedure we actually need a RDSAT program (Respondent-Driven Sampling Analysis Tool, which is free of charge).

Social Networks

Different authors have defined social networks as those telecommuting tools based on the Web. They are organized from personal, general or professional profiles of the users and they aim at connecting sequentially the owners of these profiles through categories, groups, personal labels, etc, linked to themselves or their professional profile (Danah and Nicole, 2008; Castañeda and Gutiérrez, 2010).

More specifically, two previous research projects were identified which accounted for the use of Facebook as sampling framework. One of them, Brickman-Butta (2009) was used for the catholic sampling grouped in virtual communities and, on the other hand, Silenzio, Duberstein, Tand, Lu, Tu and Homan (2009) utsed it to study hidden populations in the study of stigmatized populations.

Hidden Population

Marpsat and Razafindratsima (2010) identified the hidden population as those members of a population of interest difficult to identify, and who are easily detected and rarely registered. The people of interest do not wish to reveal they are members of said population of interest; their behavior is unknown which leads to a bad choice of places where to address them. These have the following characteristics:

- Since the size of the population of interest is relatively low, conducting a research in all this population is very costly.

- The members of the population of interest are difficult to identify.

- There is no sampling framework, or it is very incomplete.

- The geographic distribution of the population of interest is unknown which makes it difficult to choose the places where to locate them.

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Snowball Sampling

Atkinson and Flint (2001) comment that the snowball sampling is a technique used to find the object of the research where a subject gives the researcher the somebody else's name who provides the name of a third party and so on, hence, usually associated to exploratory, qualitative and descriptive researches, above all in studies where there are few interviewees or a high level of trust is needed to develop them. Likewise, Sampieri *et al*., (2010) explain that this type of sampling identifies key participants which are added to the sample. They are asked if they know other people that can provide more extensive data and, once contacted, they are also included in the sample.

Applications and Examples of Online Sampling

Some papers present an experience of application of online sampling and mixed methods in studying hidden population; for example, Baltar and Gorjup (2012) locate a group of immigrant Argentinean entrepreneurs and use them as a source of information to online groups. On the other hand, Estrada, Santamaría, Pérez and Romero (2017) applied sampling techniques for online surveys sustained by traditional methods with some applications of only surveys /Survey Monkey, Qualtrics, Key Survey, among many more).

They also applied an online sampling (Facebook) and the traditional snowball sampling through which they achieved identifying 52 online Argentinean groups living in Spain. Subsequently, every member received a personal message explaining the purpose of the study and inviting them to participate.

In a study addressing the habits, tastes and ways of relating to social groups, Lorenzo, Gómez and Alarcón del Amo (2011) were centered in relationships of individuals and not on their characteristics for which the tools used allowed locating individuals based on the characteristics published in their profiles, and also offer the opportunity to build new relationships through existing friends.

Another innovative sampling would be carried out by Bateman, Gray and Butler (2011) who generated an online discussion community called *BroadForum*, where, through an invitation message which includes a description of the project and the endorsement of the manager, they were invited to complete an online survey in change of the opportunity to win a gift certificate. Another example could be Miller and Sonderlund's 2010), who conducted a research on hidden populations of illegal drug users and used methods based on the Web to discuss the main advantages and disadvantages.

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Telecommuting

Telecommuting Definition

Different authors agree that telecommuting is a model where employees can carry out work remotely, whether from their home or any other location for which they must employ some technological means of information and communication (Martínez *et al*., 2003; Thibault, Briz, Fandos and Álvarez, 1998; Franco and Restrepo, 2011; Miano, 2004; Di Martino and Wirth, 1990).

Gray, Hodson and Gordon (1995) conceptualized it as a flexible manner of organizing work which consists in carrying out a professional activity without the physical presence of the worker in the company during an important part of his work schedule, since it embraces an extensive range of activities and can be carried out full or part time and their professional activity in telecommuting implies the frequent use methods of electronic information procedure and the permanent use of some telecommunication means to make contact between the telecommuting and the company.

This term is defined at government and institutional levels; for example, the Costa Rica Republic, where pursuant to decree No 37695, telecommuting means:

> The rendering of services outside the facilities of the public sector provided the needs of service allows it partially or totally from his own domicile, center aimed to such intent, customer attention, or field work, through the use of web-based means.

Another example is the European Union where telecommuting is defined as follows:

> Any form of work carried out on behalf of an employer or a client, by a dependent worker, as self-employed worker or a telecommuting which is performed regularly and during an important part of the working time from one or more different places of the traditional working place, by using information technology and/or telecommunication (Gallegos, Campos, Ernst and Young, 2013).

Telecommuting Background

Nilles (1995) is considered to have proposed the term *telecommuting* for the first time. He had envisaged that this employment modality could solve social and business issues such as reducing cost of real estate surface in companies, plan labor and family life, work opportunities for people that have some kind of disability, vehicle traffic relief in cities as well as the reduction of air pollution, among others (De Luis Martínez, Pérez and Vela, 2004).

It is known that this employment modality emerged during the 70's, from the oil crisis suffered in 1973 and 1979 when began the awareness process about the importance of the consumption of fuel, of lengthy transits as well as bottlenecks in the main metropolitan cities.

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Telecommuting Types and Classifications

Sánchez, Pérez, Carnicer and Jiménez (2003) consider the importance to point out that said modality has three types of telecommuting:

a) **At home**. This type of telecommuting may be performed from home with a flexible schedules imposed by the worker himself (it has been observed that women are more susceptible to adopt this type of employment).

b) **Telecenters or satellite offices**. People commute from their home to a geographic location close to their domicile. This working location is equipped with the furniture and the infrastructure appropriate to the development of the work and said center is part of the company.

c) **Mobile telecommuting**. In this classification, the worker commutes continually from several places according to the requirement of his presence, and he frequently gets in touch with the office where he provides his services. These links may be carried out from an airplane, car, hotel, banking, educational institutions, etc. (plant managers, investors, bankers, among others) (Flores, Rojas and Silva, 2013; Colombian Law 1221, 2008; Gallegos *et al.*, 2013).

In addition to this classification, Martínez *et al.*, (2003) identified two other telecommuting types:

a) Formal. When the worker adapts to a structured and organized program.

b) Informal. When the worker may begin his work at the office and conclude it at home or any other location of those referred.

Telecommuting Characteristics

Martínez et al., (2003) also listed some characteristics observed in telecommuting:

1) It is work at distance.

2) The presence of the teleworker is not needed in the company.

3) The work that has been assigned can be performed in the place believed to be the most appropriate, such as eat home, a restaurant, car, traveling or wherever the worker is.

4) Work at hours and number of hours believed to be appropriate.

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5) The work schedule does not need to correspond to the company's work schedule.

6) ITCs are used intensively.

The same authors acknowledge that telecommuting offers some advantages to companies as well as employees such as savings on real estate, concentration on the productivity of their collaborators, the flexibility (for the employee), time dedicated to work, less need to commute (Martínez *et al*., 2003).

They recognize the disadvantages for both agents; for the company, the training cost is higher for a teleworker than for a normal worker, and there is also the possibility that the teleworker misuses the company's information. On the other hand, the teleworker loses his employment status, he is separated from the power center which impedes him any promotion, he works in isolation and has a sedentary lifestyle and may have conflicts within his family nucleus (due to his schedule).

Similarly, the society benefits form these employment arrangements; the environmental impact is reduced (less traveling), there are savings on electricity, office supplies, etc. The size of the impact depends on the number of teleworkers in a country, city, community and, above all, on the frequency at which teleworkers carry out their work activities (Martínez *et al*., 2003).

Researches and Studies on Telecommuting

De Luis *et al*. (2004) comment that there are several studies on telecommuting that focus on aspects such as public transportation, private transportation (Aguayo, 2010), commuting time to work, distance traveled from home to the work area and the stress generated when commuting to the workplace (Alonso y Cifre, 2002).

Sánchez, Pérez, Carnicer y Jiménez (2003) present some studies on telecommuting in which they expound the direct and indirect effects of the environmental impact generated by the application of this alternative model of employment; for example, the pendular commuting to the workplace, reduction of pollution emissions and energy consumption, among others.

Flores, Rojas y Silva (2013) also mention some professional activities that are entering this modality; for example, application developers (*Apps*), electronic media and social network analysts, sales executives, *social media* administrators, systems and computing engineers, telecommunication and administrative informatics professionals, professionals related to marketing, graphic designs, among others.

Hochschild (1997) refers to different studies on gender and the way in which the teleworker tries to enhance the balance between meeting the work requirements and those of the family. However, there are few studies addressing the effects this employment modality may have on the family nucleus and mainly on the female gender

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since it seems that telecommuting would be more appropriate for women because it would facilitate the synchronization between her work activities and those of her family.

Martínez *et al*. (2003) assure that there are abundant studies on telecommuting that have similar results in regard to the decrease in commuting and its impact on the environment given the reduction of polluting emissions.

Categories of Telecommuting

Miano's work (2004), developed in Argentina, suggests that telecommuting consists of a series of categories, deduced by the author, in which the subject matter referred to may be carried out. Besides grouping the impact areas of the subject matter, these categories are mentioned and described in Table 1.

Method

This paper has been developed over a six-month period in Victoria de Durango, where there is a greater geographic concentration of people besides being the main municipality and capital of the State of Durango, hence considered the largest economic center.

The study that led to this work is related to the exploration of some of the teleworkers' characteristics. According to the methodology followed and since the fundamental object of this research consists in identifying the people that have a work activity with specific characteristics given the fact that we are dealing with a hidden sample, it is essential to implement online sampling tools which are described here below.

The facilities used as operative center for this research are the Postgraduate, Research and Technological Development Unit (UPIDET, [Spanish acronym]) belonging to the Durango Technological Institute as part of a research project of the Master's Degree in Business Planning and Development, reason why this program was conducted in said facilities (work rooms, furniture, equipment, Internet connection), moreover, the Institute offered to advise and direct the thesis.

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Tabla 1. Categories of Telecommuting

Category	Description
Trust and Promotion	This category groups the debates referring to the need of trust between the employer and the teleworker as a requirement to implement this employment modality. The control over the production affects the main agreements regarding labor relations: establishing the compensation (hourly rates or payment per objectives achieved), type of contract (teleworkers in comparison to dependent or independent workers), establishing tasks deadlines and the prices at which teleworkers sell their services)
Attenuation of unemployment and self-employment	This category debates the possibilities of telecommuting to reduce unemployment and the contradictions implied by promoting autonomous telecommuting; the role of the State in generating employment is also taken into consideration. References to the possibilities for the disabled to telecommute also falls into this category.
Subjectivity	The aspects related to the subjectivity of the teleworker such as the feeling of isolation given the lack of daily personal contact, the delimitation of the domestic and work spaces, the management of the daily tasks are grouped under this category.
Regulation	The debates regarding the lack of legal framework regulating this employment modality are grouped under this dimension. We believe that this topic is what concern most teleworkers since from a first reference to the topic made at a congress, twenty presentations were submitted.
Training	This dimension refers to the debates that teleworkers have in regard to the training required for this type of work. They talk about collaborative learning or learning doing – doing learning

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Deregulation and precarious work	The following questions are posed when thinking about the need of having a legal framework for this work modality: Who deals with the infrastructure expenses? What happens when these materials have to be renewed? What happens if a worker has an accident while working from home? What happens with his contributions? and, How are compensations established?
From monitoring to self-monitoring	This form of monitoring supposes that the worker himself monitors his schedule in order to attain his objective or make time work to accomplish more tasks at the same time. This self-monitoring has strong repercussions on the teleworkers' subjectivity. The compensation based on results also affects establishing the remuneration. In most cases, teleworkers experience problems pricing their work objectively. Since there are no objective criteria established for the remuneration of this type of work, a great amount of work is left without being compensated; this occurs mainly with designers who often submit their final work to their employer and the latter asks them to make some changes. These changes imply major amounts of work which are not remunerated.
A new way of employment	In regard to the possibilities of telecommuting to reduce unemployment, we ask ourselves: How many informants were unemployed before telecommuting? If one was already working, who took the initiative in implementing this work modality? Was it the company or the worker? And lastly, How was this decision taken?
Subjective Dimension	The most recurrent problem is delimiting the work schedule which has to do with the necessary self-monitoring to comply with the objectives set forth by the employer. The main problem resides in putting an end to the day's work and to subject even physiological demands to the pace of work. The topic of isolation is inherent to this employment modality since by being delocalized from the central office, the worker no longer has personal contact with the other workers. During the interviews, teleworkers agree that this modality has positive aspects since they do not have to commute to the place of work, they have more liberty in self-managing their schedule and they do not have to subject themselves to hierarchies of the work spaced which become more apparent when the worker goes to the office on a daily basis.

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Permanent Self-learning	From the analysis of the interviews, we note that the teleworker gathers new knowledge while working. Knowledge often works as a condition to solve a specific task, and the time invested in this type of training is never compensated.

Source: proposed summary in Miano (2004).

Sample

Sampieri *et al*. (2010) recommend that in the case of studies in which the information is taken primarily form people, the term *sample* be substituted by "participants"; in this study, the participants are designated as "group of participants". We first attempted to contact this type of group through labor and professional associations and organizations of the State; for example, the chambers of producers, merchants and service providers, workers and union associations, etc.

This search universe comes to life through the contact strategy involving 39 agencies of which eight correspond to professional associations and the remaining 31 to the chamber of producers and service providers. After identifying this universe, we visited eight organizations in order to know the number of affiliates that currently carry on this type of telecommuting; however, none of these organizations had the information required; hence, we took the decision not to continue the search with the remaining institutions.

The eight associations visited for this field work represent 20.511% of the 39 agencies aforementioned. No worker that met the telecommuting characteristics could be located; even the chairmen and the directors had no idea that this employment modality even existed and they declared that in this city, no workers of this type would be located.

In addition to the search, we also looked for some census or count at the National Statistics and Geography Institute (INEGI, [Spanish acronym]), unfortunately, as for the associations, chambers and organizations in the city, we would not find any reference of the number of people who performs their labor activities through telecommuting. It was then that we made the decision to apply an alternative method to try to identify, insofar as possible, the number of teleworkers in the City of Durango.

This is where, from the revision of the literature, that the online sampling comes into action. It was considered an alternative to locate people that carry out telecommuting in the City of Durango through social networks in order to take advantages of the benefits it offers such as speed and greater penetration. In this case, we chose Facebook.

In addition to the online tool, we use the sampling method known as online snowball sampling. We started contacting people familiar or close to the researcher's social circle, who started the process of locating people carrying out telecommuting activities or who, at least, could refer us to other people that could have the characteristics of a teleworker.

Instrument

This type of research played a decisive role in determining the type of sample, a collection instrument that could not be considered ordinary or common; it had to be an innovative instrument that could locate the individuals needed for this project. In this case in particular, Facebook social network was chosen as the instrument of application.

After deciding that the use of this instrument was the first step of our project, we design a page where we entered the basic information on the conceptualization of telecommuting according to the revision of the literature developed for this research. Once the site was built, we sent messages to some known persons (ten for each phase) and we gave them the following instructions:
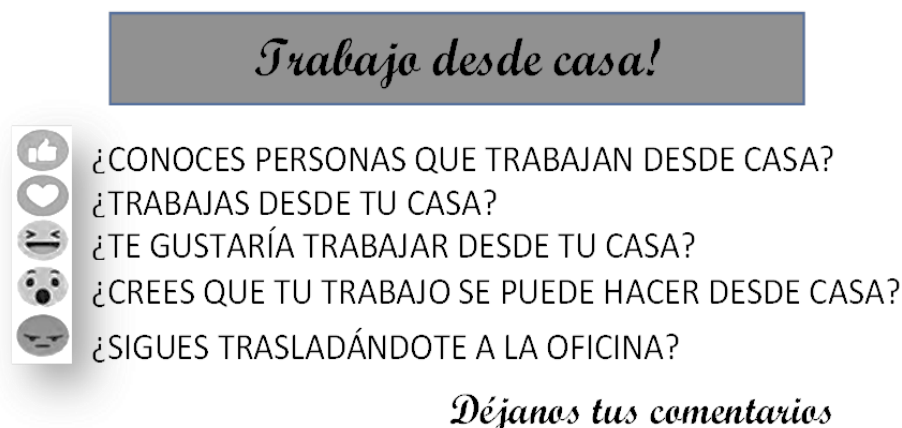
- Forward the page reference to known people with the purpose of diffusing the information.

- In case the person reading the page is a teleworker, he/she should identify himself/herself as such, or, if not, refer a person who is a teleworker through this page.

The diffusion process through Facebook started with several pilot tests aiming at determining id the information published was sufficiently clear to the reader. The pilot test procedure can be described as follows:

- First, ten people previously located on the list of friends of the researcher's personal site were invited through a text message (*inbox*). They were instructed to visit the site (created instrument), to read the description, see the content published on said site and provide feedback through a comment to know if the information was clear enough. Moreover, they were asked to refer someone they knew who worked under the telecommuting scheme.

- This process was repeated eight times to the same number of people (10), with the same instructions but with some slight adjustments according to the feedback provided in the first round.

The elements diffused on the page (instrument) are summarized as follows:

- A brief description of telecommuting and its three main types.

- An image inviting to indicate what was the employment condition of the participants by selecting an icon or *emoji*:

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Figure 1. Employment Condition.
Source: Developed by the author.

Likewise, this page contained a video explaining the elements aforementioned.

Once the pilot tests met the gathering of information, the page was published openly and was sponsored to achieve greater penetration and capture as many views as possible. It should be mentioned that this application was filtered with some restrictions or parameters provided by the social network itself to ensure the access to the target sample defined in this study, namely:
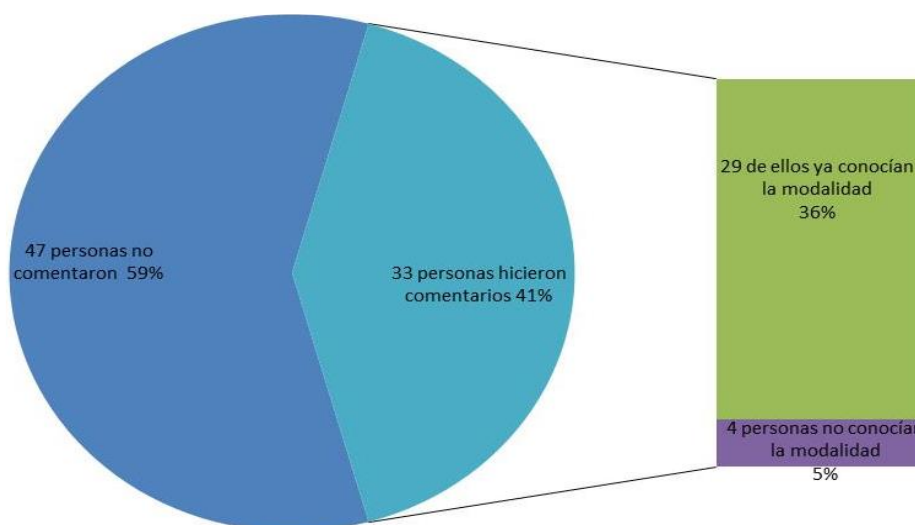
• Men and women between 18 and 65 years of age.

• Residing in the city of Durango, Mexico.

• Postgraduate studies in progress or completed.

• University studies in progress or completed at the following universities:

  o Instituto Tecnológico de Durango [Durango Technological Institute]

  o Universidad Autónoma de Durango [Durango Autonomous University]

  o Universidad Durango Santander [Durango Santander University]

  o Universidad España UNES [Spain University [UNES]]

  o Universidad Interamericana para el Desarrollo [Inter-American University for Development]

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o Universidad Juárez del Estado de Durango [Juarez University of the State of Durango]

o Universidad Pedagógica de Durango [Pedagogical University of Durango]

o Universidad Politécnica de Durango [Durango Polytechnic University]

o Universidad Tecnológica de Durango [Durango Technological University]

o Universidad Tec Milenio [Tec Milenio University]

The Facebook filter was used as the tool to promote our publication with people that met the characteristics aforementioned and to offer greater assurance that it would reach the right people for this study.
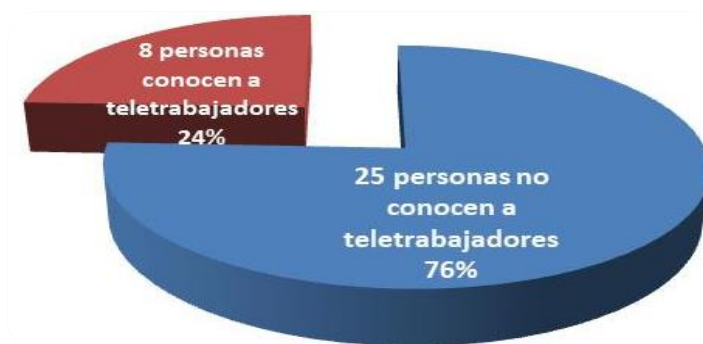
Results

In the first phase of the application (pilot test), we contacted 80 people, of which 33 (41.25%) wrote a comment while on the other hand, the 47 remaining persons (58.75%) did not respond as shown in the following graph:

Figure 2. Distribution of the responses of the pilot tests.
Source: Developed by the author.

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As we deepen the comments of the 33 people on our publication, 29 of them (36%) had had some reference regarding telecommuting as an employment modality, while the remaining four persons (5%) did not know of the topic.

From the 33 persons who responded to the publication, 25 (76%) of them mentioned no knowing other people that carried out telecommuting as employment modality. However, on the other hand, the remaining participants (eight) (24%) said to know someone who carried out this type of employment in the city of Durango, which led to a 10% factor result of people that knew some teleworker.

Figure 3. People that responded to the publication of the pilot test.
Source: Developed by the author.

From the open application of the instrument, we obtained the following results, In the first round, we contacted 1,330 persons according to the statistics provided by the Facebook platform. The online vide was shared 133 times with Facebook people and groups. From the total of people contacted, 636 only reproduced the video but did not write any comments.

Table 2. Distribution of the participants of the publications

	People who saw the post	People who commented on the publication	Real teleworkers located	Factor (%)
Pilot tests	80	8	6	7.5
Publication 1	1 330	0	0	0.00
Publication 2	4 714	21	11	0.23
Publication 3	7 816	57	6	0.08
Totals	**13 940**	**86**	**23**	**0.16**

Note: The "factor" column shows the total of teleworkers located among the total of the people that saw the publication.
Source: Developed by the author.

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In the second round, the publication reached 4714 people of which 21 made a comment. However, some of the comments were not related to the participants' working conditions. With the comments related to our task, we contacted eleven persons who said carrying out their work activities outside the office.

In the third round, the publication reached 7,816 people among the network users. In this case, 57 persons interacted with the publication and left a comment. At the point, we contacted six people that said they needn't go to a specific place of work on a daily basis.

We could locate 23 individuals in the City of Durango who met the teleworker's characteristics. These individuals were willing to participate in a subsequent study. In addition to determining the number of teleworkers, it is important to locate said workers and invite them to participate in a future study to further develop this subject.

We then proceeded to request the e-mail and the mobile number of every teleworker located in the City of Durango. When considering the factor calculated (0.1649), we applied what was considered as the universe for this study, that is, the statistical datum generated by the National Statistics and Geography Institute (INEGI [Spanish acronym]) from the National Survey on the Availability and Use of the Information Technologies in Households (ENDUTIH [Spanish acronym]) which provided the information on the availability and use of the information and communication technologies in households.

The foregoing information helped us establish that the factor aforementioned was applied to a universe of 118,823 people who are considered viable as teleworkers since they use technology to carry out their work activities. Hence, we could infer that at least 196 people located in the City of Durango carry out telecommuting activities according to the calculation shown below:

Table 3. Computer users per selected city according to the 2016 type of use

Economically active population (PEA [Spanish acronym])	Population that uses a computer for work activities	% of PEA	Teleworkers Determinated factor	Estimated population of teleworkers
258 769	118 283	45.70%	0.16%	196 personas

Source: INEGI. National Survey on Availability and Use of Information Technologies in Homes (ENDUTIH [Spanish acronym]) 2016. Computer users for work activities.

The objective of this study has been met with the approximation aforementioned since it is necessary to infer an approximate number of teleworkers to pursue other studies related to this topic.

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Conclusion

Locating teleworkers in a specific city is a complicated task, especially if we consider that said activity is not typified as an employment modality recognized by the authorities which translate in the lack of surveys, registries or statistics at national, state or municipal level that provide quantitative information of this employment modality.

In an effort to locate teleworkers, we needed to conduct a follow-up different from the traditional ones to achieve the objective of our research project. We had to explore the official databases of the INEGI, the Labor Ministry, and even the registries of professionals registered before different associations and business chambers. However, the search in those sources of information did not led to positive results given different circumstances, such as the lack of updated data of some organizations consulted.

The general ignorance of the topic addressed was another problem we encountered in locating this type of workers. For example, when chairmen and directors of business chambers and organizations were asked about this employment modality, they manifested their total ignorance; they even said that teleworkers could not be found in the city.

As an alternative, the online sampling method, more specifically the instrument of social networks as tool to locate teleworkers was a success – at least if we consider the business chambers and organizations appraisals – notwithstanding the fact that at the beginning, some participants did not understand at all the information provided on Facebook. We consider that the subsequent publications met the objective of identifying and inferring a number of people within the city of Durango or its surroundings that do carry out their work activities through commuting.

Even though having located and contacted 23 people is a low number given the conditions under which this study was conducted, we consider said result a success given the adverse circumstances arising from the demographically reduced city where the study was conducted which implies a reduced number of companies or corporations that work under this modality on a regular basis, besides the lack of knowledge of the term among business chambers and organizations as well as the lack of registries and counts of official institutions such as the INEGI.

Given the foregoing circumstances, the size of the sample obtained is considered sufficient for subsequent original researches referring to the study of the teleworkers' characteristics, as well as the impact of this modality in other variables such as measuring the changes in commuting, changes in working habits, impact on health, etc.

It is also important to analyze the possibility of replicating this study in city with a larger number of inhabitants, companies and corporations with the purpose of pursuing the present research with a greater sample and being able to extract more reliable information.

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[i] People who work in a computerized way, away from the business of their employer or those who hire them and who transmit the results of their activity via a telecommunication link [ECaTT (1999), cited by Havriluk, 2010].

[ii] Employment model in which people can perform work remotely, either from home or another location for which they must use some technological means of information and communication (Martínez *et al.*, 2003).

* Luis Miguel González García. Cátedras CONACyT (Instituto Tecnológico de Durango). Research Professor of the CONACyT Chair, attached to the Technological Institute of Durango in the Master Program in Business Planning and Development. Boulevard Felipe Pescador 1830, Nueva Vizcaya, 34080 Durango, Dgo. Mexico, Tel +52 6181873829, Fax: (618) 818-6936 ext. 120. drlmgonzalez@gmail.com ORCID ID http://orcid.org/0000-0001-5938-3497

** José de Jesús Sosa Hernández. Instituto Tecnológico de Durango. Student of the Technological Institute of Durango. Master's Program in Business Planning and Development. sosajose1990@gmail.com ORCID ID https://orcid.org/0000-0002-0927-8119

*** Santiago David Fierro Martínez. Instituto Tecnológico de Durango. Research Professor of the Technological Institute of Durango in the Master Program in Business Planning and Development. sdfm23@hotmail.com ORCID ID http://orcid.org/0000-0001-5848-4683

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