

## Searching the productive uses of ICTs for human development of the young university students

### *En busca de los usos productivos de las TIC para el desarrollo humano de los jóvenes universitarios*

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Ana Isabel Zermeño Flores\*  
<http://orcid.org/0000-0001-7371-8767>  
Universidad de Colima, México

Mabel Andrea Navarrete Vega\*\*  
<https://orcid.org/0000-0002-5290-3127>  
Universidad de Colima, México

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Irma Liliana Contreras Reyes\*\*\*  
<https://orcid.org/0000-0003-1236-0401>  
Universidad Autónoma de Aguascalientes, México

#### ABSTRACT

From the perspective of the capacities of Amartya Sen and the autonomy of Doyal and Gough, it is sought to know the productive practices with ICTs in university students because it is assumed that they can expand their capacities to take opportunities and participate in social life. Through a documentary method, a corpus of 59 scientific documents from 20 countries, published between 2010 and 2018, was analyzed to characterize the social practices with ICTs in young university students. Practices for learning, citizenship, communication and prosumerism were found; cellphone and social networks were identified as preferred technologies versus the Internet and the personal computer. In addition, it was possible to define the productive techno-practices on the frame of human development for these young students.

#### Keywords

Basic needs; ICTs;  
university students;  
cultural practices;  
digital native

#### RESUMEN

*Desde la perspectiva de las capacidades de Amartya Sen y de la autonomía de Doyal y Gough, se busca conocer las prácticas productivas con las tecnologías de la información y la comunicación (TIC) en los jóvenes universitarios, porque se asume que estas pueden expandir sus capacidades para aprovechar las oportunidades y participar en la vida social. A través de un método documental se analizó un corpus de 59 documentos científicos de 20 países, publicados entre 2010 y 2018, para caracterizar las prácticas sociales con las TIC que realizan los jóvenes universitarios. Se encontraron prácticas para el aprendizaje, la ciudadanía, lo comunicativo y el prosumismo, y se identificó la emergencia del teléfono celular y las redes sociales como las tecnologías preferentes de uso frente a la difuminación del internet y la computadora. Además, se lograron definir las tecnoprácticas productivas de cara al desarrollo humano de estos jóvenes.*

#### Palabras clave

Necesidades básicas;  
TIC; estudiante  
universitario; prácticas  
culturales; nativo  
digital

\* Research professor at Social Research University Center and Academic Coordinator of Agorante, a society and technologies research group. PhD in Audiovisual Communication. Specialized in technologies for development (ICT4D).

\*\* Operation director of Agorante. Master's in information technologies. She has collaborated with digital education inclusion projects in Chile from 2001-2006 and she has been co-organizer of local and national digital education inclusion projects from 2011.

\*\*\* Academic Coordinator of Research and Documentation at the Colima State Institute of Women. Master's student in Social and Humanistic Research at the Autonomous University of Aguascalientes. She has collaborated at Agorante as a research assistant.

## Introduction

At the emergence of the current social configuration identified as a society(ies) of knowledge or informational society, there are new ways of referring to the citizen of these social formations. As a contextual exercise, Table 1 gathers terms mostly used by the academy to identify this new subject; as seen, these denominations lead us to the use of information and communication technologies (ICT) in respect to age: young people.

Facing the techno-utopian image, in relation with these highly digitally linked subjects, there are critical questions that highlight the need for empirical data to support these arguments (Brown & Czerniewicz, 2010; Hargittai, 2010; Helsper, 2012; Selwyn, 2004). These metaphors (mainly that of the digital native) are also questioned by young people who were born after 1980 (popularized as millennials) who have no access to ICT, to higher education or to an employment, who are known as NEET: young people who are not in education, employment or training (Social Exclusion Union, 1999).

**Table 1.** Terms to identify subjects of the IT society

Concept	Meaning
Knowledge worker (Drucker, 1993)	Subject who applies ideas, concepts and information of their productive work instead of merely using manual skill
Digital nomad (Makimoto, 2013)	Subject with the ability to work remotely and in a decentralized manner but connected in any place thanks to the advances of smart mobile devices and high-speed communication networks
Knowmad (Moravec, 2013)	Nomad knowledge worker, characterized by creativity, innovation and ubiquitous collaboration; citizen of the knowmad society or society 3.0
Digital native (Prensky, 2001) Millennials (Strauss y Howe, 1992) Generation Y (McCrindle, 2006) Net generation and e-Kids (Tapscott & Williams, 2011)	Young person, epitome of this new society, who having been born in this digital era, is assumed to have innate competences for the use of ICT and can make the most of the advantages these provide

In this respect, the International Telecommunications Unit (2013) informs that digital natives<sup>1</sup> correspond only to 5.2% of world population and that, in relation with the young population, 30% can be categorized as active online young people over the last five years. Natives represent, in average, 10% of the population of developed countries, whereas in developing countries it barely goes over 4.2%. To this paradox the

precarious percentage of young people who manage to do college studies is added. In accordance with data of OECD (2018), the average of students of member countries who accessed higher education for the first time was 55%, with variations down (40%) in countries like Luxemburg and Mexico. In addition, it is necessary to add to tertiary education access breach, the educational quality breach, which usually is more serious in developing countries (UNESCO, 2006).

Personal and contextual conditions of digital natives should not be sidestepped. Specially, there are young people who, in spite of attending college, have access to ICT and to different software, and with already developed digital skills, who are not taking the advantage of these tools to generate changes in their living situation. That is, their range of use is quantitatively high, but their spectrum of application is qualitatively reduced to socialization and entertainment environments (Thinyane, 2010). Therefore, the generalized existence of digital natives or *knowmads* cannot be affirmed, nor that college young people use and fully and consciously take advantage of ICT; it is neither sustained that the plain use of these technologies is a guarantee to improve the living conditions of people, regardless of the generation using them.

The type of use of ICT which is of interest in this article transcends the subjective satisfaction of young people when using these technologies, like socio-communicative, leisure or entertainment practices. In this study, social practices are sought which have an incidence on subjective conditions of the quality of life, identified as productive. It is clarified that productive is not “productivist”, but the ability to take advantage of the benefits of the surroundings for survival; this reasoning is supported by the proposal of Brayubrooke (1987, quoted by Doval & Gough, 1994), who associates the productive to one of four social preconditions that the whole social group has to address if it intends to survive and prosper: production, reproduction, cultural transfer and political authority.

Understanding practices using ICT of the productive type derives into the focus of Sen’s (2010) capabilities –where freedom is an essential condition for human development– understood as those who favor the extension of liberties so that young people reach the best expression of themselves and enjoy the socially valued opportunities of wellbeing. For the purpose of this proposal, they are defined as Productive Techno-Practices (PTP). The productive aspect is of interest because it has an incidence on the personal autonomy of young people as their capacities are extended to take advantage of the opportunities and to partake in social life. From the perspective of Doval & Gough (1994), autonomy is one of the two basic needs that are to be met for human development: on the one hand, there is health for survival and, on the other, autonomy for making decisions.

In the face of this scenario, from the Husserlian perspective (Bolio, 2012), the value of this work exceeds the plain knowledge which has been studied on the subjective wellbeing of young people in relation with access and use of ICT, for the intent is to

advance in understanding social change and development. In this sense, it is possible to expect the participation of young people (without compromising their aspirations) on the solution of social problems, where the intellectual capital is paramount and ICT could generate important synergies of creativity and innovation.

Therefore, it is important to know more about productive techno-practices of this group of the population, especially those that may conveniently insert them in the dynamics of the societies of knowledge, which in the near future will be the main mobilizers of social life. It is neither strange to expect that social scientists provide solutions and discern on the problems associated to this new reality. Therefore, the interest of this article is to know how this topic is understood to design better observation strategies of the relation between the use of information and communication technologies by college young people and social change.

## Methodology

An interpretative documentary research was performed from the aprioristic approach, which allows an approximation of “intentional experience” which is “not part of the object, but of the conscience of whoever [...] observes the object” (Bolio, 2012, p. 24). Here, the proposal of Londoño, Maldonado & Calderon (2014) is followed, which responds to two analysis levels: a) the descriptive/heuristic approach, from which questions are made such as: what has been studied about productive techno-practices on college young people? Who has done this? Where? How has the object been built and problematized? What theoretical, epistemological and methodological perspectives have been followed? What type of studies have been published?; and b) the interpretative.

It must be highlighted that no hermeneutic level has been developed as proposed by the authors, but a methodological one, as no profound analysis is done on ontological or historical aspects (Barbera & Inciarte, 2012) but in a series of questions that help to understand, at the descriptive level, advances on the topic; thus, concerning questions are: what problems are seen to? How far has been gone? What is yet to do? What are the trends and challenges being identified? How is the young college student understood? Why link him/her to the productive use of information and communication technologies? How is the productive use understood with information and communication technologies by young people? What ICT practices are done?

In order to answer the questions posed above and to identify new ICT practices, a documentary search was done from 2010 to 2018, with which a significant and sufficiently current corpus was formed. To define the beginning of the search the innovation speed of information and communication technologies was considered, therefore market novelties were taken into account in the market of information and

communication technologies which generate, at a great speed, new practices. From this, it was stated that five years is time enough to identify the most current practices of interest; notwithstanding, this work gathers data of eight years. The search was carried out based on high-impact scientific magazines (Scopus, Wiley, Gale, Elsevier, ACM Digital Library, Springer, JStor, Web of Science, Ebsco Host and Dialnet). In them, the type of knowledge was identified in circulation on the topic of mainstream science, which sets a mark on the global direction of research (Rogel-Salazar, Santiago-Bautista & Martínez-Domínguez, 2017).

An inquiry was done in the area of social sciences and descriptors were used in the crossing of two semantic units: “young college students” and “ICT uses”, to identify whether those uses are significant or, rather, socially valued as being productive, and whether they address social change. As these criteria are followed, a corpus was formed with 59 texts, mostly articles with results on researches made in 21 countries.<sup>2</sup> For the systematization of information an orderly matrix was formed using general fields as well as an interpretative analysis, organized by categories.

## Development

The results are structured in accordance with the questions suggested and include several questions in a category in the heuristic and phenomenal levels. It is clarified that the texts of the corpus did not study the uses of information and communication technologies as productive techno-practices, which is understandable as its own approaches are followed; however, in this article they are defined in said form to identify the productive uses from the development framework. In the following tables (2, 3 and 4) the type of information obtained to support the analysis is organized in a synthetic manner.

**Table 2.** Classification of techno-social practices of a productive type done by young college people

Techno-social practices	Texts	Tendencies
For learning and socialization	41	School as the space par excellence for the techno-social practice of university students
Citizenship related	10	The student is understood as a citizen as well
With internet	2	Loses prominence, is assumed as infrastructure for the access to other services
With cell phone	2	Possibilities of use are beginning to be identified because of their wide introduction
For “prosuming”	2	Growing practice given the rise of web 2.0 applications
Communicative	2	Practice that holds the interest of scholars of the field

**Table 3.** Study types on techno-social practices of young college people

Types of studies	Texts
Theoretical studies	4
Case studies (young students in a university, in a city, as digital natives)	32
Comparative studies (between students from several universities in a country, between countries, between study modalities, between ethnic groups)	18
No specific information	5

**Table 4.** Concepts on the young college person

Students...	Texts
are digital natives	29
are agents of social development	10
are critical and reflexive	8
are privileged young people (they have access to education)	6
are completely connected	9
are digital strangers	5
are socially engaged	5
are conditioned by their context and their <i>habitus</i>	9
are “prosumers”	2
are proactive learners	9
are not critical in their adoption of ICT	2
are techno-resistant	2
are apathetic, non-participant	1

### What studies have been done on the PTP of young college people?

Affiliation of young people to the college setting has marked a strong trend on results. It was found that these researches are largely focused on PTP for learning which is an evidence that researchers conceive the school as the paradigmatic space of practices relating young college people to ICT. This causes loopholes on PTP in other settings or with other purposes, also focused on young people. Likewise, although it is evident that at a disadvantage regarding those of the first type, citizenship-related PTP, prosumism and the communicative setting were identified, in addition to practices focused on certain type of technologies (Internet and the mobile phone).

### *PTP for learning*

Contradictions were found that made us carry out a profound review on how ICT are understood and adopted. Some authors (Gupta, 2014; Ololube *et al.*, 2016) underscore the contradiction where while ICT are greatly appraised in higher education, uses of the most employed technologies by young people are ignored and disregarded, such as the mobile telephone and social networks, which are understood by teachers and administrators as “disruptive technologies” (Czerniewicz & Brown, 2013).

It is emphasized that, in spite of the fact that universities worldwide are making an effort to improve their infrastructure and equipment, students use a limited range of technologies for learning (Ko, Thang & Ou, 2014; Margaryan, Littlejohn & Vojt, 2011; Thinyane, 2010), since they use them to a greater extent in other settings than at their own school. That is to say, there is not sufficient evidence to affirm that learning patterns are changing, on the contrary, there are studies that show that traditional pedagogies maintain their position (Margaryan, Littlejohn & Vojt, 2011), that the passive attitude of students is still highly prevalent (Ellis, Bliuc & Goodyear, 2012; Seale *et al.*, 2015), that they lack of special visual skills (Brumberger, 2011); and that the learning potential of technologies such as the web 2.0 is not identified (Czerniewicz & Brown, 2013; Gupta, 2014; Ko, Thang & Ou, 2014; Margaryan, Littlejohn & Vojt, 2011; Thinyane, 2010). The results show that techno-practices are more socio-communicative than productive –messages, calls, email, video calls– (Thinyane, 2010). The foregoing confronts the metaphors of the digital native and the *knowmad*.

Furthermore, when dealing with a young population with access to the formal world of knowledge, their learning PTP are differentiated. In spite of being the same generation, not everyone has access to technologies or the same competences on their use. In this sense, familiarity and the experience of users is more important –time and concept of use– than age (Brown & Czerniewicz, 2010), for the digital disposition is more related with the *habitus*, with access to the technological capital (Czerniewicz & Brown, 2013) and with their agency for learning (Ellis, Bliuc & Goodyear, 2012; Jones & Healing, 2010).

Notwithstanding, the most centered measures in technical skills and attitudes towards technology find differences of gender which identify mayor digital skills in men, whereas in women there are better social and emotional skills, as well as greater anxiety in the use of ICT (Cabezas *et al.*, 2017; Lin, Shin & Lu, 2011; Martinez-Cantos, 2017).

Likewise, although there are differences in techno-practices between professors and students, as the former are less experienced, the limited use of technological tools for education by students is explained, to a greater extend, by the lack of digital proficiency of professors (Ko, Thang & Ou, 2014; Margaryan, Littlejohn & Vojt, 2011; Ololube *et al.*, 2016).

Two types of settings are identified, linked to techno-practices; on the one hand, institutional settings, which include virtual classrooms, specialized platforms (Blackburn, 2017; Cohen, 2017; El-Masri & Tarhini, 2017; Lee & Lee, 2018), educational applications, (Hwang, Chang, Chen & Chen, 2018; Msonde & Van Aalst, 2017; Shadiey, Huang & Hwang, 2017) and a specific guidance on their use (Hubbard, 2013); on the other hand, there are personal environments, where students fully use the social networks and other 2.0 tools, through their mobile devices –mainly smartphones–; these comprise independent learning settings away from the university (Humanante, Conde & Garcia, 2014), however, highly valuable for taking advantage of ICT in instruction processes.

In summary, PTP linked to education are related with the challenge universities have to incorporate ICT to respond to the requirements of knowledge of societies, which foster redesign and the generation of new educational models. From this approach, the opportunity is identified to amend practices associated to the construction of knowledge, especially those connected to the management of specialized information, to active and personalized learning, and to collaborative and ubiquitous work (Ellis, Bliuc & Goodyear, 2012; Gupta, 2014; Margaryan, Littlejohn & Vojt, 2011; Ololube *et al.*, 2016; Valetsianos & Kimmons, 2012); as well as to aspects of privacy on the use of students' personal data (Ifenthaler & Schumacher, 2016) and to strategies to train young people as professionals in the global world (Brewer *et al.*, 2015).

### *Cyber-participation PTP*

From Selwyn's (2004) perspective, social participation is recognized as the area of largest achievement of ICT. In this sense, they are crucial to identify the interests of these young people, their concerns, positions and skills which comprise them as future professionals, but also as current citizens. In this category, at least two trends are included: the former finds a virtuous relationship between ICT and the participation of citizens (Gil, Molyneux & Zheng, 2014).

From this perspective, stereotypes such as “NEET” or “apathetic youth” confront online activism and the participation in offline public spaces, from which a new model for collective learning is built (Hernandez, Robles & Martinez, 2013). Furthermore, some scholars find that cyber-participation among young people is not a homogeneous one or free from paradoxes; for example, most of the politicization is in groups that have undergone discrimination or marginalization (Spaiser, 2011), and while this disadvantage drives them to participate, this usually affects their digital capacities, especially those that are required for managing information, which reduces their options to have a more efficient incidence on public affairs (Spaiser, 2011). In contrast to activism of young people in vulnerability condition, but with access to digital media, it is confirmed that these situations are not enough to foster the participation of citizens.

Although the own nature of ICT advances entails a potential context of mediation, which may extend the social activities of young people, the lack of articulation of a perspective inside public institutions, non-governmental organizations and civil groups is evident, which enables a meaning of greater usability of mobile technologies and fosters the active exercise of the rights of citizens. The result is that social relations exercised by the vulnerable young people under study are centered more in spheres like entertainment, friends and the household (Said, 2014).

These results add to what Helsper (2012) denounces in this model of correspondence fields between digital and social exclusion, where he argues that these two spheres are related because in both fields, similar resources are moving (economic, cultural, social and personal); which reveals that the commitment with the different digital resources does not depend only on money and motivation.

In synthesis, taking advantage of ICT in citizen participation of young people is a valuable topic of study because of the growing expansion of use, competencies for handling it, and the need of these young people to be present in the social arena. Although these variables are not enough for the cyber-participation of this group to be more emphatic, it is clear that this is about an emerging phenomenon which, in view of its relevance, makes it necessary to understand to what extent do technological resources awaken social participation and to what extent do young people work for the ICT to respond to their needs.

### *PTP with Internet*

Internet uses have been emblematic techno-practices to understand the adoption of ICT; notwithstanding, in this recount it is seen that they miss their protagonist role as such. Interest shifts in another technology, such as smartphones and in web 2.0 tools (although it is implied that this technological repertoire works due to Internet). Studies on the use of Internet make it evident that the differences, when access is controlled, are marked by aspects of socio-economic privileges (Davies, Halford & Gibbins, 2012; Hargittai, 2010).

It has been found that life expectations, social position and environments, mark the manner and criteria of Internet use; that is to say, the aspiration lays out and catalyzes productive actions that move towards the attainment of the goal. In the words of Davies, Halford & Biggins (2012), the *habitus* provides individuals with the opportunity of developing critical skills that allow them to effectively be operational in their environment; or as presented by Hargittai (2010), the most favored people have greater autonomy on the use of Internet (more resources, more online experiences, and higher know-how levels) than the less privileged; people with better opportunities get the benefit, to a greater extent, if they are more committed.

In brief, Internet seems to migrate, in the understanding of researchers, towards the image of a services container where applications with more participatory interfaces offer interesting scenarios for their users (such as Facebook, WhatsApp, Spotify, Instagram, Tinder, among others). The relevance of the observation and understanding of these uses lies in the fact that consistency of the web 1.0 service (circulation of content) has been overwhelmed by the possibilities of the participation of users of the web 2.0, where the polyphony of techno-practices (and, therefore, user satisfaction) increases at the possibilities of the collaborative software associated to the devices with greater portability, which has an impact on the ways of thinking and establishing this reality as a subject of study.

### *PTP with the mobile phone*

The fast insertion of mobile technology (Donay, 2014 quoted in UNDP, 2015) has caused that scholars direct their gaze to these practices. Mobile phones have not only been studied in the set of uses of other technologies, but they have comprised particular subjects of study. As sustained by Ames (2013), the smartphone is associated with a high diversity of social practices; however, it is possible to identify a consistent pattern which balances two expectations of users:

- a) “Constant connection”, which implies being available and answer quickly to the network of friends and household members, which to young people represents a “multitask” practice (multitasking) so that they may fulfill this expectation, in addition to college duties.
- b) “Techno-resistance”, to focus on the immediate environment and reduce the drawbacks of multitasking some of them see as generators of stress, because they are simply connected, and anxiety, for they feel they do not have control. Although techno-resistance is not generalized among these young people, it offers proof that there are reflection mechanisms to control dissonance in a world which is seen to be demanding and chaotic.

The possibilities of smartphones have resulted in a new hierarchy of preferences, where computers and laptops have lost their priority (Ames, 2013; Puspitasari & Ishii, 2016); this is due to the fact that they are more portable and provide more possibilities to connect to Internet (Brown & Czerniewicz, 2010; Czerniewicz & Brown, 2013; Margaryan, Littlejohn & Vojt, 2011; Thinyane, 2010).

In synthesis, the mobile phone (specially, the smartphone) is a relevant subject of study because it accounts for the life of users online, but also as it is a window to know new forms where subjects, especially young people, access to options and opportunities offline, some of which may be significant to their life conditions. The latter cannot be

answered enough in the studies under analysis, which is an indication of a knowledge gap that deserves to be seen to in the field of studies on the use of digital media.

### *Prosumism PTP*

Presence of PTP advances in researches on young people and ICT, understood as those where individuals or collectives assume two roles on the use of Internet: “consume in” and “produce for”, whether it is information, contents, services or experiences. Alvin Toffler, the creator of the term “*prosumer*” in 1981, defines it as “when [...] we produce and consume our own output, we are *prosuming*” (2006, p. 221).

In the studies included in this category is the value of media literacy of young people, since this enables experience with mobile media and social networks, as well as with programming of platforms to use and manage contents (Soep, 2012). *Prosumism*, or the creation of contents by users (CCU), as is identified by Larisa Hjorth (2011), is a measure of the techno-culture of countries that account for online emerging creativity. In both documents, it is established that uses of Internet are not enough to become aware of the maturity and diversity of users of this technology, above all if confronted with what it means to participate in knowledge societies.

### *Communicative PTP*

There were also related works on record with the autonomy of young people for action and change, where behavioral differences and socio-communicative competencies, in accordance with age, were identified. Displacement of older young people was identified (unlike that of minors), who feel more vulnerable in the face of the amendment of referents which allow us to separate the intimate sphere from the public sphere, which is associated with social networks and media (Nuñez, Carcia & Hermida, 2012).

On the other hand, few communicative competencies are identified in young college people on the use of the media and social networks when dealing with public debate; for example, some authors (Kelling, KIelling & Lennon, 2013) identified, in the conflict of closing a university, that students made use of classic methods to search for information and to state their protests instead of using more modern communication modes (such as Twitter or Facebook), as was done by university authorities, the press and the government.

Although studies that found this category are minimum, it is revealed that traditional media are still present in the communicative practices of young people, therefore, they would have to be taken into account in the investigations on techno-

practices and to not ignore their participation as they adopt the perspective of the digital native where information and communication technologies have the protagonist role.

### **How has the study of PTP been performed?**

The *corpus* analyzed is mostly comprised of empirical and case studies (college students of an institution, of a city and of digital natives in a specific town). Comparative studies were also found which researched towns in accordance with gender differences (among institutions of a country, between different countries, among diverse educational modes and different ethnic groups, mainly). If we weigh that case studies in a single university had the largest presence, the need to perform greater scope projects to confront diverse realities to obtain more robust conclusions may be inferred.

Regarding the methodology employed, most of the works were of the quantitative type, supported by techniques such as the survey, the interview and focus groups. Behind them are studies of a qualitative type, which used techniques such as the interview, ethnography, observation, discourse analysis, focus and discussion groups; and, to a lesser extent, there were experimental studies that used control groups. Mixed approaches supply advantages to understand the phenomena of study both at an extensive and an intensive level, therefore, it would be desirable that, like comparative studies, this type of researches increased.

Among theoretical frameworks is the inclination to Bourdieu's *habitus* perspective and capitals in studies from England or by researchers of said country (Czerniewicz & Brown, 2013; Davies, Halford & Gibbins, 2012; Seale *et al.*, 2015); this is also the case of studies from South Africa which, until recently, was a British colony.

The high tendency to confront young college people with the metaphor of the digital native is revealing, which is discussed on only with their counterpart (digital migrants) but with a new subgroup identified as “digital foreigners”, which corresponds to young people who do not have the experience and opportunities, who have barely used a computer and who do not have easy access to information and communication technologies out of the college campus (Czerniewicz & Brown, 2013). The techno-utopian paradigm is questioned of the digital native, at the same time it is affirmed that the competences of young people are clearly sensitive to different contextual influences, which include the household, peers and the institution (Davies, Halford & Gibbins, 2012); that is to say, they are linked to other variables and that age is not a determining factor.

### *Who produces knowledge about PTP?*

The production of articles follows the center-peripheral logic described by Alatas (2003), where the United States, England and France comprise the center of scientific production in social sciences worldwide. In the case of this study, the United States and England produced almost half of the studies analyzed, followed by France, while underdeveloped peripheral countries have a reduced number of publications.

If we compare the countries where studies were conducted (different from the countries of the authors), by their Human Development Index (HDI) (UNDP, 2015), with interests explicitly and implicitly identified in the articles analyzed, imaginary ones are different. Less-developed countries are concerned to unmask social gaps objectified in the digital gap of young people, while countries with a better HDI focus on optimizing their educational models, exploring cutting-edge technological environments, or improving citizen participation of college students, preferably.

### *How is the young student understood?*

The subject of study definition is identified to be greatly absent. Most of the research analyzed choose young college students because of their affiliation to an educational institution and presupposes their ways of life as a function of this specific scenario, which results in a dangerous reductionism when the intention is to study their participation with information and communication technologies.

On the one hand, the complex reality of these actors is omitted, who not only attend time and test requirements, studies, classes, professors, principals and school mates, among other issues and academic interactions, but who negotiate their times, expectations and knowledge with other scenarios and aspects, such as the household, friends, job, community and their own personal space.

On the other hand, the ubiquitous nature of these technologies relocates users, which enables them to simultaneously share different scenarios with their corresponding practices. For this reason, the study of PTP of the young college student ought to take this complexity into account and to not subsume it or fragment it to closed categories, as a student or as a digital native.

Although nowhere in the *corpus* is the young college student defined or discussed as a specific category or variable category of study, in the analysis, there were features identified with which they are associated to and that help to understand the ways in which researchers understand this social actor. On the whole, he/she is associated to the “digital native” category, but it is also understood that they are “social development actors”, “critical and reflexive”, “privileged” (with access to education) and “digital

foreigners”; and it is assumed that they are “constantly connected”, “socially committed”, “conditioned by their context and *habitus*” and, to a lesser extent, they are characterized as “prosumers”, “proactive with their learning”; in addition, contrary to the foregoing perspectives, they are considered as “acritical to adopt ICT”, “techno-resistant” and “apathetic or non-participative”.

#### *What ICT are young college students associated with?*

There are two trends identified in the articles that comprise the *corpus*: in the first one, there are researches that analyze digital environments and that extensively and in parallel observe different technologies; in the second, there are studies that focus on specific technologies without discarding interference of the digital environment in techno-practices; under this item, studies on the mobile phone, social networks and platforms that are consistent with the preferences of use of young college students stand out.

As mentioned, Internet has lost its stance as a specific technology and, in a way, researchers are reporting this. In the articles, Internet is studied as part of the digital environment of students and as a tool that enables access to divers’ services and information, but that, as a specific referent, fades out.

Something similar happens with the computer (whether a desk computer or a laptop), which is integrated as a technology to which students have access and which is associated to the productive work of the university. Precariousness of access is also identified, because not every college student, mainly those of developing countries, have this type of device personally, which refers to digital and social gaps in this generation and social group.

Platforms comprise another technology in the digital environment of young people which is not preferred by them. They are different and correspond to strategies of educational technologies proposed by different institutions for their students to take their courses of study, to develop specific competences (Blackburn, 2017), to manage their learning processes attending to accessibility and inclusion (Seale *et al.*, 2015), to make products (Soep, 2012), to partake and deliberate (Hernandez, Robles & Martinez, 2013; Spaiser, 2011). An emphasis must be made in the fact that some studies contrast these institutional environments with personal learning environments, accounting for the technology the students prefer, such as social networks, mobile telephones, and applications (Humanante, Conde & Garcia, 2014).

Email is identified as part of digital environments, although it is diluted by the techno-practices of college students. This technology is associated by young people, mainly, with formal communication, mainly for academic or labor life, different from

informal communication sent by messenger and chat with their close friends (Ames, 2013; Nuñez, Garcia & Hermida, 2012; Seale *et al.*, 2015).

Finally, the high levels of adoption of the mobile phone, mainly when it has access to Internet, enables techno-practices of constant connection and ubiquity that are identified as an opportunity to reduce the digital gap of young people; notwithstanding, their modes and efficiency on PTP are not yet explored sufficiently.

## Conclusions

When the *corpus* is analyzed as a function of the questions presented, comprehension horizons are identified, which represent eventually configured intuitions of an investigation line on the use and advantage of ICT by young college students, as techno-practices with the potential to generate opportunities for the improvement of their life condition.

First off, from the field of ICT for development, no studies on the use of these technologies and their potentiality to have an impact on the quality of life of young college students were identified. Most of the investigations were focused on down-to-earth ICT adoption areas, on the whole, on the educational area, whereby the role of the student is represented and his/her participation is made invisible in other equally important spaces.

This approach way leads us to the study of more controlled and short-term realities with a scientific value; notwithstanding, it stays outside the complexity of the life of these young people, where ICT play a strategic role to manage activities in different settings where they interact with the diverse groups they belong to. It is implied that this possibility is relative to the number of young people who have access to these technologies, therefore, it is evident, as specified by the studies, that there still is an access gap for this generation.

In the second place, precariousness of studies from Latin-American countries (specifically, from Mexico) in mainstream sciences, states a historical, systemic and cultural problem, where intentionality is centered in the meaning horizons of developed countries. For this reason, it is important to strengthen the realization and dissemination of studies that account for other realities that are absent in the bases of high-impact international reviews.

This does not mean that researchers from other countries should not perform an analysis in Latin America, or that they lack quality; the problem is that if international scientific policies are maintained to overestimate publications in the English language,

the high cost to publish and have access to these publications, and simulation of scientific policies of countries that provide precarious financing that limit the development of long-term research, as well as its design, execution and dissemination, will make it more difficult to have access to this knowledge and to the development of science, which would cause these countries to continue paying the price.

In the *corpus* there are cases of researchers who study the reality of developing countries, and, although the perspective of a foreign person on the social reality is appreciated, the contribution of a scientist who, as an insider, gives a specific value in the interpretation of the data is lost. With this, knowledge of local and daily culture which the foreigner is not aware of and which is not supplanted by a period of permanence in the culture under study is wasted. To the foreigner, his/her referent is his/her culture and convened international parameters, that gives in to the reality and leaves out other specific ways of existence.

In the third place, no definition was detected of productive techno-practices with ICT; therefore, from this work and from a socio-cultural position, they are defined as actions that relate social actors and the ICT repertoire in based conditions; consequently, they articulate knowledge, skills, subjective and inter-subjective meanings about the world generally, and the activity they especially perform, which have an incidence on the opportunities for the quality of life of the person who performs them.

The foregoing means that the productive element is not a derivative or an essential condition of access and use of the technology, but a practice transcending the subjective scope and that is linked to multiple variables (cognitive, personal, social, cultural, technological and contextual) that are related with basic aspects of human development (health/survival and autonomy/freedom of action).

Finally, studies that seek to understand and to have an incidence on the PTP of the young college students' people, ought to take into account longitudinal, comparative, and multidisciplinary designs, with mixed methodologies. The young person ought to be observed from the complex gaze articulated by him/her:

- a) Multiple knowledge of young people (not only digital) that come into play on the use and the advantage of ICT.
- b) Techno-practices in tune with a hybrid technological repertoire and in constant innovation that allow users to move among different environments, which questions the traditional forms of understanding the used of ICT (since it is not convenient to observe the use of one technology as if it were privative of a field, for example, of education).

- c) Resignification of techno-social practices, concerning the constant technological innovation.
- d) Various scenarios where the young people are moving (not only the educational scenario), both people connected to off/online everydayness, and those coupled with the global context.
- e) Specific conditions of the young people, whether they are socio-economical, cultural (generation, gender, ethnic group), aspirational and personal, which stop the advantageous use of ICT.
- f) The horizon of human rights as a parameter of social inclusion in the global environment of the 21<sup>st</sup> Century.

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<sup>1</sup>“The population of young people connected of 15 to 24 years of age, with five or more years of online experience” is assumed to be a digital native (UIT, 2013, p. 19). It must be highlighted that, to those who are writing this article, the time factor is not enough to categorize a “digital included person”, since qualitative variables need to be considered such as experience of use.

<sup>2</sup> Germany, Australia, Austria, China, Colombia, South Korea, Ecuador, Spain, United States of America, Estonia, Indonesia, England, Israel, Ireland, Nigeria, Portugal, Qatar, South Africa, Thailand, Taiwan and Tanzania.

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## REFERENCES

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- Alatas, S. (2003). Academic dependency and the global division of labour in the social sciences. *Current Sociology*, 5(6), 599-613.
- Ames, M. (2013). *Managing mobile multitasking: The culture of iPhones on Stanford campus*. Ponencia presentada en Computer Supported Cooperative Work 2013, San Antonio, Texas.
- Barbera, N. & Inciarte, A. (2012). Fenomenología y hermenéutica: dos perspectivas para estudiar las ciencias sociales y humanas. *Multiciencias*, 12(2), 199-205.
- Bedoya Abella, C. L. (2010). Amartya Sen y el desarrollo humano. *Memorias*, 8(13), 277-288.
- Bell, D. (2001). *El advenimiento de la sociedad post-industrial: un intento de prognosis social*. Madrid: Alianza.
- Blackburn, G. (2017). A university's strategic adoption process of an PBL-aligned eLearning environment: an exploratory case study. *Educational Technology Research and Development*, 65(1), 147-176.
- Bolio, A. P. (2012). Husserl y la fenomenología trascendental: Perspectivas del sujeto

- en las ciencias del siglo XX. *Reencuentro. Análisis de Problemas Universitarios*, (65), 20-29.
- Brewer, P. E., Mitchell, A., Sanders, R., Wallace, P. y Wood, D. D. (2015). Teaching and learning in cross-disciplinary virtual teams. *IEEE Transactions on Professional Communication*, 58(2), 208-229.
- Brown, C. y Czerniewicz, L. (2010). Debunking the digital native: beyond digital apartheid, towards digital democracy. *Journal of Computer Assisted Learning*, 26, 357-369.
- Brumberger, E. (2011). Visual literacy and the digital native: An examination of the Millennial Learner. *Journal of Visual Literacy*, (1).
- Cabezas, M., Casillas, S., Sanches-Ferreira, M. y Teixeira, F. L. (2017). ¿Condicionan el género y la edad el nivel de competencia digital? Un estudio con estudiantes universitarios. *Fonseca, Journal of Communication*, 15, 115-132.
- Cohen, A. (2017). Analysis of student activity in web-supported courses as a tool for predicting dropout. *Educational Technology Research and Development*, 65(5), 1285-1304.
- Czerniewicz, L. y Brown, C. (2013). The habitus of digital strangers in higher education. *British Journal of Educational Technology*, 44(1), 44-53.
- Davies, H., Halford, S. y Gibbins, N. (2012). *Digital natives? Investigating young people's critical skills in evaluating web based information*. Ponencia presentada en WebSci 2012, Evanston.
- Doyal, L., y Gough, I. (1994). *La teoría de las necesidades*. Barcelona: Col. Economía Crítica, FUHEM, Icaria.
- Drucker, P. (1993). *La sociedad postcapitalista*. Buenos Aires: Sudamericana.
- El-Masri, M. y Tarhini, A. (2017). Factors affecting the adoption of e-learning systems in Qatar and USA: Extending the Unified Theory of Acceptance and Use of Technology 2 (utaut2). *Educational Technology Research and Development*, 65(3), 743-763.
- Ellis, R., Bliuc, A. y Goodyear, P. (2012). Student experiences of engaged enquiry in pharmacy education: digital natives or something else? *Higher Education*, 64(5), 609-626.
- Gil, H., Molyneux, L. y Zheng, P. (2014). Social media, political expression and political participation: Panel analysis of lagged and concurrent relationships. *International Communication Association*, 64, 612-634.
- Gupta, S. (2014). Choosing Web 2.0 tools for instruction: An extension of task-technology fit. *International Journal of Information and Communication Technology Education*, 10(2), 25-35.
- Hargittai, E. (2010). Digital na(t)ives? Variation in internet skills and uses among members of the Net Generation. *Sociological Inquiry*, 80(1), 92-113.
- Helsper, E. (2012). A corresponding fields model for the links between social and digital

- exclusion. *Communication theory*, 22(4), 403-426.
- Hernández, E., Robles, M. y Martínez, J. (2013). Interactive youth and civic cultures: The educational, mediatic and political meaning of the 15M. *Comunicar*, 20(40), 59-67.
- Hjorth, L. (2011). Locating the online: Creativity and user-created content in Seoul. *Media International Australia*, 141, 187-199.
- Hubbard, P. (2013). Making a case for learner training in technology enhanced language learning environments. *CALICO Journal*, 30(2), 163-178.
- Humanante Ramos, P., Conde, M. y García Peñalvo, F. (2014). *Differences and similarities in use and acceptance of PLEs between universities in Ecuador and Spain*. Ponencia presentada en IDEE '14 Proceedings of the 2014 Workshop on Interaction Design in Educational Environments, Albacete.
- Hwang, G. J., Chang, S. C., Chen, P. Y. y Chen, X. Y. (2018). Effects of integrating an active learning-promoting mechanism into location-based real-world learning environments on students' learning performances and behaviors. *Educational Technology Research and Development*, 66(2), 451-474.
- Ifenthaler, D. y Schumacher, C. (2016). Student perceptions of privacy principles for learning analytics. *Educational Technology Research and Development*, 64(5), 923-938.
- Jones, C. y Healing, G. (2010). Net generation students: agency and choice and the new technologies. *Journal of Computer Assisted Learning*, 26(5), 44-56.
- Ko, C. J., Thang, S. M. y Ou, S. C. (2014). Investigating the ICT use and needs of digital natives in learning english at a Taiwanese University. *International Journal of Web- Based Learning and Teaching Technologies*, 9(2), 32-45.
- Kelling, N., Kelling, A. y Lennon, J. (2013). The tweets that killed a university: A case study investigating the use of traditional and social media in the closure of a state university. *Computers in Human Behavior*, 29(6), 2656-2664.
- Lee, H. Y. y Lee, H. W. (2018). The effects of cross-modality and level of self-regulated learning on knowledge acquisition with smartpads. *Educational Technology Research and Development*, 66(2), 247-265.
- Lin, S., Shin, T. y Lu, R. (2011). ICT Proficiency and gender: a validation on training and development. *International Journal of Technology and Design Education*, 23(2), 179-190.
- Londoño, O., Maldonado, L. y Calderón, L. (2014). *Guía para construir estados del arte*. Bogotá: International Corporation of Networks of Knowledge.
- Makimoto, T. (2013). The age of the digital nomad: impact of CMOS innovation. *IEEE Solid State Circuits Magazine*, 5(1), 40-47.
- Margaryan, A., Littlejohn, A. y Vojt, G. (2011). Are digital natives a myth or reality? University students' use of digital technologies. *Computers & Education*, 56, 429-440.

- Martínez-Cantos, J. L. (2017). Digital skills gaps: A pending subject for gender digital inclusion in the European Union. *European Journal of Communication*, 32(5), 419-438.
- McCrindle. (2006). *New Generations at Work: Attracting, Recruiting, Retraining & Training Generation Y*. Australia: McCrindle Research.
- Moravec, J. (Ed.). (2013). *Knowmad Society*. Minneapolis: Education Futures.
- Msonde, S. E. y Van Aalst, J. (2017). Designing for interaction, thinking and academic achievement in a Tanzanian undergraduate chemistry course. *Educational Technology Research and Development*, 65(5), 1389-1413.
- Núñez, P., García, M. y Hermida, L. (2012). Tendencias de las relaciones sociales e interpersonales de los nativos digitales y jóvenes en la web 2.0. *Revista Latina de Comunicación Social*, (067), 179-206.
- OECD. (2018). Population with tertiary education (indicator). <https://doi.org/10.1787/0b8f90e9-en>
- Ololube, N., Agbor, C., Major, N., Agabi, C. y Wali, W. (2016). 2015 Global Information Technology Report: Consequences on knowledge management in higher education institutions in Nigeria. *International Journal of Education and Development using Information and Communication Technology*, 12(2), 4-25.
- PNUD. (2015). Índice de Desarrollo Humano (IDH). Publicado por el Programa de las Naciones Unidas para el Desarrollo. Nueva York. Consultado en línea en: [http://hdr.undp.org/sites/default/files/2015\\_human\\_development\\_report\\_overview\\_-\\_es.pdf](http://hdr.undp.org/sites/default/files/2015_human_development_report_overview_-_es.pdf)
- Premsky, M. (2001). Digital natives, Digital immigrants. *On the Horizon*, 9(5).
- Programa de las Naciones Unidas para el Desarrollo. (2015). *Panorama general. Informe sobre desarrollo humano 2015*. Washington: PNUD.
- Puspitasari, L. & Ishii, K. (2016). Digital divides and mobile internet in Indonesia: Impact of smartphones. *Telematics and Informatics*, 33(2), 472-483.
- Rogel-Salazar, R., Santiago-Bautista, I. y Martínez-Domínguez, N. (2017). Latin American scientific journals of Communication indexed in WoS, Scopus and Open Access databases. *Comunicación y Sociedad*, (30), 165-193.
- Said, E. (2014). Jóvenes vulnerables y participación móvil en Colombia: estudio sobre el grado de participación y apropiación ciudadana entre beneficiarios de programas sociales. *Innovar*, 24(52), 31-44.
- Seale, J., Georgeson, J., Mamas, C. y Swain, J. (2015). Not the right kind of 'digital capital'? An examination of the complex relationship between disabled students, their technologies and higher education institutions. *Computers & Education*, 82, 118-128.
- Selwyn, N. (2004). Reconsidering political and popular understandings of the digital divide. *New Media & Society*, 6(3), 341-362.
- Sen, A. K. (2010). *Desarrollo y libertad*. Buenos Aires: Editorial Planeta.

- Shadiev, R., Huang, Y. M. y Hwang, J. P. (2017). Investigating the effectiveness of speech-to-text recognition applications on learning performance, attention, and meditation. *Educational Technology Research and Development*, 65(5), 1239-1261.
- Social Exclusion Unit (SEU). (1999). *Bridging the Gap: New opportunities for 16–18 year olds not in education, employment or training*. London: Her Majesty's Stationery Office.
- Soep, E. (2012). Generación y recreación de contenidos digitales por los jóvenes: implicaciones para la alfabetización mediática. *Comunicar*, 19(38), 93-100.
- Spaiser, V. (2011). *Young people's political participation on the internet in Germany: empowered ethnic minority groups?* Ponencia presentada en 12th Annual International Conference on Digital Government Research, College Park, Maryland.
- Strauss, W. y Howe, N. (1992). *Generations: the history of America's future, 1584-2069*. New York: Morrow.
- Tapscott, D. y Williams, A. D. (2011). *Macrowikinomics: nuevas formas para impulsar la economía mundial*. Barcelona: Paidós.
- Thinnyane, H. (2010). Are digital natives a world-wide phenomenon? An investigation into South African first year students' use and experience with technology. *Computers & Education*, 55(1).
- Toffler, A. y Toffler, H. (2006). *La revolución de la riqueza*. México: Debate.
- UNESCO. (2006). *Compendio mundial de la educación 2006: Comparación de las estadísticas de educación en el mundo*. Montreal: Instituto de Estadística de la UNESCO.
- Unión Internacional de Telecomunicaciones (UIT). (2013). *Medición de la Sociedad de la Información 2013. Resumen ejecutivo*. Ginebra: Unión internacional de Telecomunicaciones.
- Valetsianos, G. y Kimmons, R. (2012). Networked participatory scholarship: Emergent techno-cultural pressures toward open and digital scholarship in online networks. *Computers & Education*, 58(2), 766-774.