Analysis of Technological Appropriation by Elderly People. Beyond Age*

[English Version]

Análisis de la apropiación tecnológica en el adulto mayor. Más allá de la edad

Análise da apropriação tecnológica em idosos. Além da idade

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Abstract

Objective: to demonstrate the current access conditions to the digital age by the elderly people and their true options of technological appropriation, in the city of Santiago de Cali (Colombia). **Methodology**: a qualitative analysis technique is applied to a focus group of elderly people to deal with different issues related to their behaviors and needs associated with the digital age. Interviews were conducted on topics such as technological interest, State responsibility, digital literacy and technological appropriation, seeking to determine their views on the issue and their possibility of real insertion. **Results**: findings show that the focus group assumes technology as the driver of today's world. The 10 participants are aware of the use of Internet as the key to perform many of the daily activities such as obtaining information, communication, sharing, learning and marketing. However, the 100% of the participants expressed that the technology is more focused on meeting the needs of young people than of the elderly, and they would like to keep up with it. They also recognize that their management of tools and applications is very limited, which makes them feel excluded. **Conclusions**: it is concluded that the elderly is a population at risk of technological exclusion due to a variety of factors such as personal, motivational, educational, social and governmental factors which hinder their effective incorporation into the information society.

Keywords: Appropriate technology; Adult and technology; Technological insertion of elderly; Digital literacy; Digital appropriation.

Resumen

Objetivo: evidenciar las condiciones actuales de acceso del adulto mayor a la era digital y sus reales opciones de apropiación tecnológica, en la ciudad de Santiago de Cali (Colombia). **Metodología**: se recurre a una técnica de análisis cualitativo aplicada a un grupo focal de adultos de la tercera edad, a través del cual se trabajan diferentes aspectos relacionados con sus comportamientos y necesidades asociadas a la era digital. Se realizaron entrevistas acerca de temas como interés tecnológico, responsabilidad estatal, alfabetización digital y apropiación tecnológica, buscando determinar su postura frente al tema y su posibilidad de inserción real. **Resultados**: se halló que el grupo focal asume que la tecnología es lo que mueve el mundo de hoy; los 10 participantes son conscientes de que es imprescindible el uso de internet para realizar muchas de las acciones cotidianas como informarse, comunicar, compartir, aprender y comercializar.

Sin embargo, el 100% de los participantes expresó que la tecnología está más enfocada a satisfacer las necesidades de los jóvenes que de los adultos mayores y quisieran estar a la par. También reconocen que su manejo de artefactos y aplicaciones es muy limitado, motivo que les hace sentirse excluidos. **Conclusiones**: se concluye que los adultos mayores constituyen una población en latente riesgo de exclusión tecnológica, debido a diversos factores de tipo personal, motivacional, formativo, social y gubernamental que dificultan su incorporación efectiva en la sociedad de la información.

Palabras-clave: Tecnología adecuada; Adulto y tecnología; Inserción tecnológica del adulto; Alfabetización digital; Apropiación digital.

Resumo

Objetivo: demonstrar as condições atuais de acesso dos idosos à era digital e suas reais opções de apropriação tecnológica, na cidade de Santiago de Cali (Colômbia). **Metodologia**: utiliza uma técnica de análise qualitativa aplicada a um grupo focal de adultos idosos, através do qual são trabalhados diferentes aspectos relacionados a seus comportamentos e necessidades associadas à era digital. Foram realizadas entrevistas sobre temas como interesse tecnológico, responsabilidade estatal, alfabetização digital e apropriação tecnológica, buscando determinar sua posição sobre o assunto e sua possibilidade de inserção real. **Resultados**: verificou-se que o grupo focal assume que a tecnologia é o que move o mundo hoje; Os 10 participantes estão cientes de que o uso da Internet é essencial para executar muitas das ações diárias, como informação, comunicação, compartilhamento, aprendizado e marketing. No entanto, 100% dos participantes expressaram que a tecnologia está mais focada em atender às necessidades dos jovens do que dos adultos mais velhos e eles gostariam de estar a par. Eles também reconhecem que seu gerenciamento de artefatos e aplicativos é muito limitado, o que os faz sentir excluídos. **Conclusões**: conclui-se que os idosos constituem uma população em risco latente de exclusão tecnológica, devido a vários fatores pessoais, motivacionais, de treinamento, sociais e governamentais que dificultam sua efetiva incorporação na sociedade da informação.

Palavras-chave: Tecnologia apropriada; Adulto e tecnologia; Inserção tecnológica do adulto; Alfabetização digital; Apropriação digital.

Introduction

This article addresses a problem in which the elderly people are the main characters. Elderly people are, according to the Congress of the Republic of Colombia (2008), people who are 60 years or older who do not have the same conditions of inclusion. This is due to the excessive and rapid technological progress of the current information society, and their various characteristics and precarious options for digital literacy and appropriation.

And when talking about information society, a term coined by contemporary authors (Carrillo-Gamboa and Batra, 2012; Mostafa and Sabbag, 2016; Cezar and Suaiden, 2017; Ziemba, 2019), one should think about a great social niche where individuals have the same possibilities of development and participation, regardless of their age, gender or condition. A truly democratic society in which all citizens have the same rights with no exclusion, allowing individuals to enjoy the wonders of a modern world (Usgame-Zubieta and Charum, 2005).

To this respect, one of those wonders is precisely the access and use of the internet, which is a communicating bridge between individuals and the modern world (Vásquez-Rizo and Gabalán-Coello, 2017); a world in which the key area of development is the information society, which offers an endless accumulation of inclusion alternatives associated with the digital era. However, this context has hidden claims and challenges, especially for those populations such as the elderly, whose development, literacy and inclusion involve different factors associated with their distinct characteristics, such as ignorance of digital security and privacy or anxiety because of the discovery of something new or excessive connection hours, among others.

This is how in a changing world and in constant evolution, access and technological knowledge can be an element for or against people (Schoemaker and Tetlock, 2017); and in this daily life of information and knowledge, the elderly are the most forgotten individuals and some of the most vulnerable to the conditions of speed and rapid obsolescence of artifacts that are requirement to live in this modern world.

Therefore, this paper intends to demonstrate the current access conditions of the elderly people to the digital age, the city of Santiago de Cali, Colombia as the setting, highlighting its real options for technological appropriation and its possibilities of achieving literacy.

The Elderly as the Unit of Analysis

In order to support this theoretically, it is necessary to understand and evaluate the real possibility that the elderly have in the acquisition and use of Information and Communication Technologies - ICT, particularly from the point of view of lifelong learning a concern supported by the positions of Dogruel, Joeckel and Bowman (2015) and Zilidis and Zilidou (2018).

According to Merchán-Maroto and Cifuentes-Cáceres (2014), citing the contribution to the Disengagement Theory by Cumming and Henry (1961), the elderly are individuals who act, in a general way, in accordance with their will or what causes them motivation or interest. Their obligations are reduced, they assume the majority of their activities in isolation, disassociating themselves or being disassociated, in part, by the social context, not by choice but because others think they prefer it that way. Such assumption is shared by Motte and Moñoz (2002), stating that the elderly people develop a positive image of themselves only if they feel linked to something useful and continuous, however, unfortunately this is not how other members of society perceive it.

That is why, according to Mogollón-González (2014), the more involved the elderly feel in the use of ICTs, through access to the Internet and other equipment, the better their cognitive progress with respect to the digital world. Nevertheless, this must be clear not only for the individual adult but also for their community.

This is precisely where education becomes a paramount issue to transcend and to allow the elderly to feel involved and acquire "sensitivity" in this regard, because education is the process through which older adults reduce the risks of losing their cognitive capacity, increase their options for social integration and thus contributing to their personal well-being. (Latin American and Caribbean Demographic Center [CELADE] and Economic Commission for Latin America and the Caribbean [ECLAC], 2011).

Technology as an Instrument of Inclusion (or Exclusion)

Before specifically addressing education for the elderly, it is important to clarify the concept of technology which for this purpose, it is understood according to San Martín and Guisen (2016) as a mechanism that should respond to a socio-technical approach and enable social inclusion for those who use it in a specific context of collaborative work, and as part of a joint activity (systemic thinking). Thus the participation of the individuals in said conglomerate is not meaningful or evident.

That is, a technology serving as a tool to generate less exclusive dynamics, enhancing the capacities of individuals and their contexts and enabling effective communications, which allow the exercise and enjoyment of individual and collective rights, based on true Mediated Educational Practices -PEM (Marín-Ossa, 2015).

It is no secret to anyone that ICTs have progressively and significantly introduced paramount changes in educational, productive and business processes in people's daily lives and work. (Carnoy, 2002). This assumption is shared by Kaschig, Maier and Sandow (2016) who recognize that technological implementation has given rise to new possibilities and collaborative work structures, allowing full interrelation between people, groups of people and the environments they share.

And, this is just what a responsible society should allow with the digital and technological incorporation of the elderly in true articulated systems of development, which give them settings to perform responsibly and on equal terms in supportive, caring, transformative and inclusive educational settings.

A Paradigm Shift from Education

The arrival of ICTs and the emergence and development of a networked information society has forced us to have a knowledge that enables its effective use and insertion. This is why today's society requires new skills, capabilities and abilities, which are all associated with the digital world. Unfortunately, such an acquisition is not possible with traditional training; therefore, there is a need for a continuing education. In this regard, Silvera (2005) refers to it as more than a necessity, as an inherent right to the development of people living in a digitalized and modern society. This is because education cannot still be conceived as a process dependent on tangible materials, instead it must be seen from a deeper perspective and, it is through a lifelong education in ICT that a true "literacy in skills" can be achieved. (Irrazabal-Paz and Loutayf, 2014).

This literacy that is aimed at appropriation in the individuals (in this case the elderly), does not seek anything other than achieving the accreditation of those ICT skills and practices necessary for their development in the digital age, that is, in life itself, without discarding their knowledge history. On the contrary, what is sought with this kind of education is to incorporate technological use into said knowledge (Chiu and Liu, 2017).

Otherwise, there will still be a polarization between those who are updated on technology and those who are not. This opens even more what some authors such as Rodríguez-Gallardo (2012) and Molina-Durán (2017) call the "digital gap". This gap is nothing more than a social one and everything that this ma-

cro-concept entails, where the elderly people, are undeniably recognized today as the main victim of the human digital evolution. (ECLAC, 2008; Sunkel and Ullman, 2019).

Technological Education for the Elderly

In order to finish this theoretical section, it must be said that according to the report of "World Population Perspectives", by the United Nations (UN, 2017), there are currently more elderly people per inhabitant in the world than ever before, and this amount is ever increasing.

This situation had already been demonstrated by the United Nations Educational, Scientific and Cultural Organization, UNESCO (1997), through the "Hamburg Declaration on Adult Education", which emphasized the importance of the non-exclusion of these people in society, despite the technological advancements, allowing them the possibility to learn with fair conditions and in appropriate ways, recognizing, valuing and using their abilities, skills and potential.

Unfortunately, this is not happening, as it seems that most of the programs for digital literacy are aimed at improving the skills of young people during their different levels of training (primary, secondary and higher education), ignoring the elderly in curricula and training programs. This fact can be seen in these current programs' prerequisites and requirements.

This is precisely the point where this article aims to influence, through calling attention to society to understand that, although the elderly need additional or different help for their effective inclusion in the information society, it should be understood that their training process must be patient, long lasting, and it must begin with the most basic aspects which involve the simplest acts and perhaps even "obvious" (for the rest) in this field.

Therefore, this education, which beyond being specialized, must be focused on fundamental needs. It should be characterized by providing the elderly with an environment that is rich in stimuli, as stated by Agudo, Pascual and Fombona (2012), with new models and strategies of action. In this way, the elderly can learn with ICT, involving the design and permanent creation of new learning and communication settings that are capable of managing the existing demand by this important group of people.

As mentioned above, this study takes place in the city of Santiago de Cali, a city that is gradually trying to enter digital development, where, as in the rest of the world, many of the current activities revolve around the internet and technology.

This city's reality makes all its individuals, including the elderly, want to be part of this environment. However, there are still certain issues that do not allow such an environment to transcend, such as, the lack of campaigns for digital literacy, the lack of interest by the government and the educational institutions and the lack of enthusiasm of some people to help them get involved in this dynamic (including, sometimes, by these same elderly subjects) among others.

Methodology

In this research, we chose to apply the qualitative analysis technique, through a focus group, carried out between February 9th and May 24th, 2018, consisting of 10 people (five men, five women), over 60 years, from strata 2 to 3 and with a basic level of education (between primary and high school). This was done in order to understand the behavior, shortcomings, attributes and needs that elderly people have in terms of their possibility of effective inclusion in the technological and digital world.

To this regard, we tried to identify the interaction and adaptation that elderly people have with technology and their ease of use, as well as to determine the level of awareness that the focus group had about the importance of its use and implementation.

For this, questions related to the following aspects were raised: interest in technology, state responsibility in the subject, digital literacy, technological appropriation, human factors that affect the use of technology, possibilities for training and training, access and use, technological knowledge, among others.

These aspects led to outline a general panorama associated with this theme, with the intention of suggesting possible alternatives for the greater citizenship of the city of Santiago de Cali, as well as identifying positive and negative elements linked to said modern social inclusion process.

Results

It was established that for the selected focus group it is an unappealing reality that technology "is what moves the world", so they affirm that "they are aware that the use of the network (internet) is essential to perform any type of action , even the most common ones, such as: to inform, communicate, share, learn and commercialize ". In the same sense, an elderly person states:

"The old mechanisms to communicate or inform us are becoming obsolete, it is time to adapt to this new system, which if used well, could give us surprising and unimaginable results… we all here must understand that we are in a new century and that the future is calling us. "

However, 100% of the participants recognize that such technology is more focused on meeting the needs of young people than elderly people, but they would like to access it and keep up with these young people. They also recognize that their knowledge in management and in everything that has to do with technology is very limited, which is why they tend to feel excluded from this information society.

On the other hand, for them education (without dwelling on specificities or advanced knowledge in the subject) should be the way in which they can appropriately get a grasp on ICT. Although they understand that they cannot start from scratch due to their age, they should undergo some type of program that would allow them to enter the subject or approach this new knowledge. For most of those surveyed, the current generations have the advantage that from a very young age they are linked, through education, in this new dynamic, even if this digital education is not perfect. However, they express their fear about the dangers that today's children and young people face by their exposure to ICTs, especially social networks, because they think they are too permissive.

Now, when older adults are asked about the government's role in this digital literacy for their generation, they argue that they do not feel included in the State's plans. They affirm that from the same conception of state educational policies (Ministry of Information Technology and Communications, 2018), it is evident that there is no real intention to incorporate them into this context, supporting their opinion mainly in the social imaginary that discredits them as competent subjects to manipulate such artifacts. Here they raise the following question: "How do you want us to be competent and to articulate ourselves to the information society if we are not trained to do so?"

In relation to the above, an elderly person says: "the other day I knew of a workshop that the Mayor's Office in technology management opened ... it was something basic, I guess ... but it does not always happen …".

Upon hearing this contribution, an elderly person adds: "… that is true, I also knew of that workshop and I signed up, because I do not want to continue to lag behind in something that my grandchildren are already ahead of me. However when the course started, surprisingly only four people were registered, so the workshop was never held and then I didn't hear anything else"

With this testimony, an additional problem is evident to those that have already been addressed and it is the disinterest of many older adults on these issues. Although the government fails in some aspects, the elderly citizen

also disregards the few state or institutional options that are offered to them (Paz-Saavedra, 2008); This is why, from the economic point of view, it is often not feasible or profitable to create programs or courses on technology, focused exclusively on this type of audience.

With regards to the above, there is the fear that the elderly may feel for the new or for what is alien to them, including the fear of error, mockery or commitment assumed with a new responsibility, for which they do not feel completely prepared or don't have control, because the vast majority prefer to maintain the comfort of what is already known and do not want to experiment with new activities, especially if they go beyond the traditional dimension of the senses (Pérez-Díaz, 2009).

On the other hand, they also comment that family, friends, neighbors and the surrounding society also have no greater intention (or patience) to involve them in these issues. Some expressed that many of their relatives consider it a waste of time to take elderly people to the management of technological resources and, in this way, they judge even their motor and intellectual abilities, arguing that they do not allow them enough skills to even try to acquire this type of knowledge.

One of the interviewees states:

"Today's society cannot boast of living in a globalized world if it does not take into account all people, either by age, as is our case, or by other factors (purchasing power, social status, gender ...), as it is obvious that only some sectors, especially the rich and powerful, enjoy all the privileges and rights to information…".

And another adds saying:

"Society must be prepared to expand technologies and internet to all people, taking into account each particular condition or specific situation ... ... I know it is difficult, but we already suffer, I just hope this does not happen with young people from now on when they get old and the technology they know becomes obsolete".

All these opinions, although they may sound like excuses to justify the lack of interest of the elderly in the subject or to support their exclusion from the current scenarios by society, it is still worrying when there is a widespread interest, at least within academia, to reduce the existing digital and technological gap, which affects the most this population group.

Thus, in digital matters, being an elderly person should not be a death sentence, but should be understood as another stage of life in which you can continue to grow intellectually (Fernández, Penecino and Ascolani, 2016); a phase of existence in which teaching in the management of ICTs must be a permanent stimulus, an incentive, even, to reduce the risks of some cognitive diseases or some depressive clinical states (Americas 5G, 2018).

That is why, among the testimonies that this study compiled, there is also the voice of those who demand inclusion in formal processes and, at the same time, state that in part the decision to learn is personal: "Elderly people should feel part of this society, we cannot isolate ourselves or let ourselves be isolated thinking of invalid arguments. We are beings designed to learn and to reason, which allows us to acquire knowledge regardless of the stage of life in which we are".

To sum up, thanks to the participation of a focus group consisting of 10 people, residents of the city of Santiago de Cali, it was established that from a personal point of view, elderly population often has a lack of motivation which makes them lose interest in being part of that society or even learn the basics of technology management. This situation is more likely when the elderly people feel violated or impeded in the exercise of their rights as citizens or when they understand that nobody is interested in their participation in contexts associated with the digital era.

Conclusions

Elderly people constitute a population at latent risk of technological exclusion. This is due to the fact that there are factors of a personal, formative, social and governmental nature that hinder their effective insertion into the information society.

From the point of view of the formative, although technological education for the elderly exists, it has failed in its real concern that they have greater participation and interaction, both with different social actors and with the same technology. For this reason, more and better literacy and digital appropriation campaigns are needed for this population or more extensive attention from education institutions to generate programs and courses aimed at promoting and strengthening this type of training.

Such training should also be given to others, especially those close to the population under study, since, from the social point of view, it is useless that elderly people are trained in these skills and competencies if those around them are not attentive or willing to incorporate them into their digital activities; situation that applies to all social sectors.

For all the above, it is necessary for government entities to join this initiative, because they are the ones that establish the laws and regulations that can make this "ideal" situation of inclusion, use and access for the elderly more viable. In addition, The government is responsible for providing sufficient con-

ditions for these people to feel inserted in the information society, accepted and supported by their fellow citizens, protected by the education system and motivated individually and collectively, in pursuit of a real involvement in the technological era, tending to homogenize the already deep digital gap.

Finally, it must be said that everything described here gives rise for the academy, at least from the Higher Education Institution -IES-, so this issue becomes a matter of interest not only for a research exercise but to be a constitutive element of its social responsibility policies. This implies that Universities must develop nontraditional training alternatives (currently absent in the framework of their programs), the subjects of digital literacy being this vulnerable population, as well as others distant from the ideal of the information society.

In this way, communion will be achieved between the conventional educational system (backed by policies that guide its work from the government) and the social conglomerates that require its services, the elderly person being one of them.

Therefore, it is recommended to address the above, in order to try to reduce the digital divide, at least on a small scale, to permeate wider settings, with the intention of promoting the empowerment of elderly people on the management of ICT and all the features of the digital world.

References

Agudo, S.; Pascual, M.; Fombona, J. (2012). Uso de las herramientas digitales entre las personas mayores. *Comunicar. Revista Científica de Comunicación y Educación, 39*(20), 193-201. Grupo Comunicar. https://doi.org/10.3916/C39-2012-03-10 [Accessed February 13, 2019].

Americas 5G (2018). *TIC para adultos mayores en América Latina.* Bellevue, WA: 5G Americas. https://www.crcom.gov.co/recursos_user/2018/ac_reg/cond_etm/coment/5G-AMERICAS.pdf [Accessed February 13, 2019].

Carnoy, M. (2002). *Sustaining the New Economy. Work, Family, and Community in the Information Age.* Boston, MA: Harvard University Press.

Carrillo-Gamboa, F. J.; Batra, S. (2012). Understanding and Measurement: Perspectives on the Evolution of Knowledge-based Development. *International Journal of Knowledge-Based Development, 3*(1), 1-16. Inderscience

Publishers. https://doi.org/10.1504/IJKBD.2012.045568 [Accessed February 13, 2019].

Cezar, K. G.; Suaiden, E. J. (2017). O impacto da sociedade da informação no processo de desenvolvimento. *Informacao & Sociedade: Estudos, 27*(3), 19-29. Universidade Federal Da Paraíba. https://periodicos.ufpb.br/index.php/ies/article/view/34305/18967 [Accessed October 10, 2018].

Chiu, C. J.; Liu, C. W. (2017). Understanding Older Adult's Technology Adoption and Withdrawal for Elderly Care and Education: Mixed Method Analysis from National Survey. *Journal of Medical Internet Research, 19*(11), 49-49. National Institutes of Health. https://www.ncbi.nlm.nih.gov/pubmed/29101093 [Accessed October 12, 2019].

Congreso de la República de Colombia. (2008). *Law 1251 of 2008.* https://www.icbf.gov.co/cargues/avance/docs/ley_1251_2008.htm [Accessed February 8, 2019].

Cumming, E.; Henry, W. E. (1961). *Growing Old: The Process of Disengagement.* New York, NY: Basic Books.

Dogruel, L.; Joeckel, S.; Bowman, N. D. (2015). The Use and Acceptance of New Media Entertainment Technology by Elderly Users: Development of an Expanded Technology Acceptance Model. *Behavior & Information Technology, 34*(11), 1052-1063. https://www.tandfonline.com/doi/pdf/10.1080/0144929X.2015.1077890?needAccess=true [Accessed October 11, 2018].

Economic Commission for Latin America and the Caribbean [ECLAC]. (2008). *La sociedad de la información en América Latina y el Caribe: desarrollo de las tecnologías y tecnologías para el desarrollo.* https://repositorio.cepal.org/handle/11362/2537 [Accessed October 10, 2018].

Fernández, F. M.; Penecino, E.; Ascolani, D. (2016). Educación tecnológica en adultos mayores. In *VIII International Congress of Research and Professional Practice in Psychology - XXIII Research Conference - XII Meeting of Researchers in Psychology of MERCOSUR*, Buenos Aires, Argentina. https://www.aacademica.org/000-044/402.pdf [Accessed February 8, 2019].

Irrazabal-Paz, M. F.; Loutayf, M. S. (2014). La "alfabetización" en el siglo XXI:
el desarrollo de habilidades digitales en la enseñanza de lectura y escritu-
ra. En *Actas Congreso Nacional Subsede Cátedra Unesco UNR*, octubre, Rosa-
rio, Argentina. https://rephip.unr.edu.ar/bitstream/handle/2133/4835/
Irrazabal%20Paz%20-%20Loutayf.pdf?sequence=3&isAllowed=y
[Accesed February 17, 2019].

Kaschig, A.; Maier, R.; Sandow, A. (2016). The Effects of Collecting and Con-
necting Activities on Knowledge Creation in Organizations. *Journal of
Strategic Information Systems, 25*(4), 243-258.
https://doi.org/10.1016/j.jsis.2016.08.002 [Accessed February 13, 2019].

Latin American and Caribbean Demographic Centre (CELADE) and Economic
Commission for Latin America and the Caribbean [ECLAC]. (2011). *Los
derechos de las personas mayores. Materiales de estudio y divulgación. Hacia un
cambio de paradigma sobre el envejecimiento y la vejez.* https://repositorio.
cepal.org/handle/11362/21497 [Accesed February 13, 2019].

Marín-Ossa, D. L. (2015). La educación mediatizada. Distancias y aproximaciones
conceptuales en las metodologías de mediatización del conocimiento. *Revista
da FAEEBA – Educação e Contemporaneidade, 24*(44), 41-53.
https://www.revistas.uneb.br/index.php/faeeba/article/view/1819/1233
[Accesed February 12, 2019].

Merchán-Maroto, E.; Cifuentes-Cáceres, R. (2014). *Topic 6. Teorías psico-
sociales del envejecimiento.* http://asociacionciceron.org/wp-content/
uploads/2014/03/00000117-teorias-psicosociales-del-envejecimiento.pdf
[Accesed February 8, 2019].

Ministerio de Tecnologías de la Información y Comunicaciones, MinTIC.
(2018). *Alfabetización digital.*
http://www.mintic.gov.co/portal/604/w3-article-5447.html
[Accesed March 2, 2019].

Mogollón-González, E. J. (2014). Una propuesta para el mejoramiento cogni-
tivo en el adulto mayor: una alternativa al entrenamiento cerebral. *Re-
vista Electrónica Educare, 18*(2), 1-17. Universidad Nacional de Costa
Rica. https://www.revistas.una.ac.cr/index.php/EDUCARE/article/
view/5830/16192 [Accesed February 14, 2019].

Molina-Durán, J. V. (2017). Las implicaciones de la brecha digital para los países en desarrollo: caso Venezuela. *Sapienza Organizacional*, *5*(9), 105-128. http://erevistas.saber.ula.ve/index.php/sapienza/article/view/9976/9905 [Accesed March 1, 2019].

Mostafa, SP; Sabbag, D. (2016). A relação saber-poder na organização e re-pre-sentaçao do conhecimento. *Scire*, *22*(1), 15-24. Ibersid. https://www.ibersid.eu/ojs/index.php/scire/article/view/4296/3828 [Accessed February 28, 2019].

Motte, A.; Moñoz, J. (2002). Envelhecimento social. In J. Muñoz (coord.). *Psicología del envejecimiento* (pp. 95-110). Madrid, España: Pirámide.

United Nations, UN. (2017). *World Population Prospects. The 2017 Revision. Key Findings and Advance Tables*. https://esa.un.org/unpd/wpp/Publications/Files/WPP2017_KeyFindings.pdf [Accessed February 26, 2019].

United Nations, educational, scientific, and cultural organization Unesco (1997). The Hamburg Declaration on Adult Learning "El saber adulto, una clave para el siglo XXI". http://www.fundacion.uocra.org/documentos/recursos/declaraciones/LA-DECLARACION-DE-HAMBURGO.pdf [Accesed February 8, 2019].

Paz-Saavedra, L. E. (2008). Alfabetización digital en el adulto maduro una estrategia para la inclusión social. *Educational E-mail*, *1*, 1-16. Universidad Nacional de Colombia. https://revistas.unal.edu.co/index.php/email/article/view/12486/13224 [Accesed February 28, 2019].

Pérez-Díaz, R. (2009). Trastornos de ansiedad fóbica en el adulto mayor. Valoración crítica y manejo terapéutico. *Geroinfo. Publicación de Gerontología y Geriatría*, *4*(1), 1-22. Research Center on: Longevidad, Envejecimiento y Juventud-CITED. https://docplayer.es/15869384-Geroinfo-publicacion-de-gerontologia-y-geriatria-tratamiento-de-la-ansiedad-en-el-adulto-mayor-resumen.html [Accesed February 28, 2019].

Rodríguez-Gallardo, A. (2012). *Tecnologías de la información y brecha digital en México 2001-2005*. Mexico City.: Universidad Nacional Autónoma de México-UNAM.

San Martín, P. S.; Guisen, M. A. (2016). Hacia las tecnologías para la inclusión social en contextos educativos regionales: análisis del caso "ECCA". *Revista Electrónica "Actualidades Investigativas en Educación", 16*(2), 1-26. Universidad Nacional de Costa Rica. https://www.revistas.una.ac.cr/index.php/EDUCARE/article/view/5830/16192 [Accesed February 14, 2019].

Schoemaker, J. H.; Tetlock, P. E. (2017). Building a More Intelligent Enterprise. *MIT Sloan Management Review, 58*(3), 28-38. Massachusetts Institute of Technology-MIT. https://sloanreview.mit.edu/article/building-a-more-intelligent-enterprise/ [Accessed February 26, 2019].

Silvera, C. (2005). La alfabetización digital: una herramienta para alcanzar el desarrollo y la equidad en los países de América latina y el Caribe. *Acimed, 1*(13), 1-8. Centro Nacional de Información sobre Ciencias Médicas en Cuba. http://scielo.sld.cu/pdf/aci/v13n1/aci04105.pdf [Accesed February 28, 2019].

Sunkel, G.; Ullman, H. (2019). Las personas mayores de América Latina en la era digital: superación de la brecha digital. *Revista de la CEPAL, 127,* 243-268. Comisión Económica para América Latina y el Caribe -CEPAL. https://repositorio.cepal.org/bitstream/handle/11362/44580/1/RVE127_Sunkel.pdf [Accesed October 13, 2019].

Tecnología-RICYT (org.). *Indicadores de ciencia y tecnología en Iberoamérica. Agenda 2005* (pp. 156-192). Bogota: Colombian Science and Technology Observatory-OcyT.

Usgame-Zubieta, D.; Charum, J. (2005). Redes tecnoeconómicas entre productores y usuarios de conocimiento. In Red Iberoamericana e Interamericana de Indicadores de Ciencia y Vásquez-Rizo, F. E.; Gabalán-Coello, J. (2017). Agregando valor a las IES a través de la búsqueda y selección de información. *Social Prism. Revista de Ciencias Sociales, 18*(1), 592-602. https://revistaprismasocial.es/article/view/1427/1679 [Accesed February 28, 2019].

Ziemba, E. (2019). The Contribution of ICT Adoption to the Sustainable Information Society. *Journal of Computer Information Systems, 59*(2), 116-126. https://doi.org/10.1080/08874417.2017.1312635 [Accessed October 10, 2019].

Zilidis, G.; Zilidou, V. (2018). The Use of New Technologies Addressing Social Exclusion and Improving the Quality of Life of the Elderly. *Interscientific Health Care, 10*(4), 10-16. University of Thessaly. http://www.inhealthcare.gr/manuscript/i-chrisi-ton-neon-technologion-pliroforias-kai-epikoinonias-stin-antimetopisi-toy-koinonikoy-apokleismoy-kai-tis-beltiosis-tis-poiotitas- zois-ton-ilikiomenon [Accessed October 11, 2018].