

The Elderly as a Technological E-excluded

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Abstract

Communication and Information Technologies (ICT) are part of people's daily lives, and indeed of older adults, whose inclusion often causes trauma and, as Casamayou et al. (2017) point out, is a challenge in contemporary societies. The insertion of the elderly means a significant slowness in the process, which leads them to a tacit and explicit digital exclusion related to the complexity of the equipment itself and to the characteristics inherent to adulthood, such as visual limitations, reduced motor skills, the paradigm of being "too old to learn," insecurity, fear of being ridiculed by the "slowness to assimilate and respond," lack of knowledge of the usefulness of technology and economic capacity that affects access to the different options. This paper looks at the technological needs and difficulties that older adults have in using technological devices and understanding their language.

Keywords: Older Adults, Technology, Exclusion, Barriers

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Introduction

A technological gap is closely linked to the generational gap, which implies differences in aptitudes and attitudes towards technology that are associated with the age of each individual (Brandán, 2007). For older adults, these aptitudes and attitudes are related to the physical and psychological characteristics of their adulthood, which leads them to show a certain reluctance to enter a world that is complex for them, both in terms of technological devices and in the acquisition, use, and management of information.

Those who have autonomously entered the world of new technologies at a late age are aware of the benefits this world brings, such as the expansion of social relationships since the use of mobile phones and tools such as e-mail and instant messaging facilitate communication with others, quick access to information through resources that can support them in their daily lives, and keeping them mentally active and therefore healthy.

Nevertheless, older adults are excluded from the supply of technology products since their designs, programs, and packages are aimed at the young people's market. In this sense, products representing versatility, innovation, progress, and variety for young people are complex and challenging for the elderly. Additionally, there is the self-exclusion of the elderly, generated by insecurity and fear of electronic devices and their language, and the fear of making a fool of themselves due to their limitations of understanding, assimilation, and response.

This is the situation described by Cerda (2005): "It is not easy to imagine how complex this situation is for an individual who wants to participate in the development of society, but who does not know where he is, where he belongs, since the world in which he has lived peacefully today begins to break down and fall apart under his feet, since he cannot visualize the institutional order he once knew, the representation he had of the world is not the same, he does not know himself, he does not know who he is."

Literature Review

Population aging is a reality worldwide, with the necessary distinction being made between normal aging and pathological aging according to the relevant biological, psychological, and social factors. The United Nations estimates that by 2050, one-quarter of Latin America's total population will be older adults.

According to Villa and Rivadeneira (1999), advanced age or old age has distinctive characteristics that are present in all personal aspects, as well as in physical conditions, economic and functional independence, changes in roles within the family, participation in the labor market, use of free or leisure time, self-perception and the perception that others have of older adults, among others. Del Popolo (2001) says that the health, economic, social, and family situations and their impact on the well-being of older people vary significantly according to socioeconomic class, gender, ethnicity, and place of residence.

For their part, Berriel et.,al (2011) point out that the shift to a new paradigm of greater freedom, the importance of subjective disposition for ways of aging, allow a better relationship with activity and social ties, providing older adults a different place in society and the appropriation of digital technologies. However, Sunkel and Ullmann (2019) point out

that although the use of ICT has increased globally, the level of use in the elderly is still relatively low compared to people aged 15 to 59.

Older age is the perfect time to learn and enjoy because the older you get, the more free time you have. Most older adults tend to desire to learn new things to stay active over time. Despite this, older adults tend to increase their fear of the unknown, considering age-related limitations such as decreased visual and auditory acuity, manual dexterity, etc. (Cabanés, 2005; Ribera & Casado, 2002). One of their limitations is related to the fear of new technologies, which is aggravated by cultural and social factors that place older adults in a disadvantaged position concerning younger adults, widening the technological gap between them (Cabanés, 2005).

Factors influencing the acceptance or rejection of assistive technology include fear of the new, motivation to use, advice, training, encouragement, and ease of use. The latter reduces the difficulties that people often perceive (Mollenkopf, 2002).

For older people, this ever-changing technological world with its new devices is an obstacle to accessing information, contributing to the technological gap. The lack of knowledge and support and the physical or cognitive limitations that some people develop as they age make using technological tools almost impossible (León-Ayala, 2011).

Bergada and Hebabdi (2001) point out that cyberspace and virtual practices are good indicators of the lifestyles of older people. According to Alava and Moktar (2012), the presence of the elderly in social networks and learning communities is increasing (they are participating with specific content to offer to their audience and thus contributing to the emergence of new content targeted to their specific needs). However, the majority of them are still "e-excluded."

Querol (2012) points out that family or friendship relationships have a value that cannot be given to virtual relationships because of their different nature; consequently, new technologies to facilitate communication must become more human (Cruz et al., 2015). The use of information technologies by older people is increasing, but it differs from that of younger people, who use them with greater intensity and for different purposes.

It is expected that in a few years, we will move from the "media generation" of today's older people, characterized by having known the importance of television as the primary means of communication, to the "digital generation" of seniors of the future, accustomed since their youth to the use of new technologies (Cruz et al., 2015).

It is important to note that as society ages (Tikkanen & Nyhan, 2009), incorporating technological learning tools for the elderly becomes essential. The development of these tools becomes an international issue of business competitiveness. The ternary model "training-work-retirement" has a social change process in which older adults have gone from needing leisure activities to training activities in information and communication technologies. The centers and associations that offer activities for the elderly include formal (seminars, courses, university programs) and informal (clubs, communities, social networks) training offers to improve the technological skills of older adults (Boutrand, 2009).

Methodology

This research seeks to typify older adults based on their needs and limitations concerning technological tools in Cartagena. This is a descriptive study with a qualitative-quantitative approach and is part of a macro project about the needs and difficulties, tastes, and preferences of the elderly with the products and services the market offers them.

Ten focus groups were conducted for the research, and then a structured form with open-ended objectives was applied to a probability sample of 208 people aged 60 and over. A five-point Likert scale was used, validated with Cronbach's alpha coefficient (0.86), and a univariate and bivariate analysis was performed using Snedecor's F-test to find significant differences between the groups. Finally, a cluster analysis was performed with four partitions to obtain two extreme and two intermediate groups.

The sample comprises 48.2% men and 51.8% women aged 60 and over—46.0% of the sample work, followed by 28.8% who do housework. In terms of education (all levels were included), most people have technical (35.10%) and professional (37.17%) studies.

Results and Discussion

Some cultural and economic factors often lead the elderly of Cartagena to avoid contact with technological platforms, and there is also a gap between the speed of learning and the speed of changes in the design and updating of technological devices that are not adapted to the needs of the population under study. The following are some factors that affect the ability of older adults to use new technologies:

Understanding the Technical Language of Technological Devices

The changes in ICT language and the need to learn and use it are among the main barriers for older adults, as it means "starting from scratch." These new terms are increasingly used in people's daily lives without the need to practice a specific field or profession, especially by the younger population who grow up in tune with technology. In the case of older adults, this language is unfamiliar, which makes it challenging to use the new devices that are coming on the market:

"I do not understand the technical language of the cell phone. I repeat what my grandson says but still do not understand."

"I know it is StandBy because, at work, my husband had a radio phone."

"By repetition, I am learning the basics."

"My grandchildren laugh because even though I understand some terms, I do not know how to pronounce them."

The research findings (Table 1) show that, according to the values, the level of understanding of the technical language is low (1.71 to 3.6). When the values are analyzed by gender, they are also low. The understanding of the technical language of the mobile phone is highlighted, taking into account that the value given by men (3.8) places them at a medium-high level and

that of women at a medium-low level (3.41). This difference is significant at the 5% level, according to Snedecor's F-test.

The level of understanding of the language of the other devices could be better, especially for the tablet, where the differences are also significant at the 5% level. There are no significant differences in the understanding of the technical language of both personal and laptop computers, which confirms that the difficulties in understanding the language of these devices do not depend on gender.

N° variable	Designation	Total sample	Gender		Snedecor's F
			Male	Female	
27	Cellphone	3,5962 n = 208	3,7843 n = 102	3,4151 n = 106	F(1,206) = 6,3747 p = 0,0123
28	Laptop	2,6635 n = 208	2,5098 n = 102	2,8113 n = 106	F(1,206) = 1,6909 p = 0,1949
29	Personal Computer	3,0048 n = 208	2,9412 n = 102	3,0660 n = 106	F(1,206) = 0,2692 p = 0,6044
30	Tablet	1,7163 n = 208	1,5196 n = 102	1,9057 n = 106	F(1,206) = 4,2612 p = 0,0402

Source: update and expansion of Cuenca and Hoyos's (2016) database.

Table 1: Understanding of the technical language

Use of Technological Devices

The complexity of technological devices and their rapid and constant change tends to create a time lag for older adults forced to be in a "new beginning." This is where the limitations in learning capacity, the fear of making a fool of oneself, making a mistake, or losing all the information on the device become relevant.

Skills in the Use of Cellphones

The mobile phone is the device that older people are most comfortable with. It is important to note that most do not use mid- to high-end or state-of-the-art devices:

"I use the cell phone for what I know how to do: make calls, take pictures, and send messages. The rest my daughter can do and tell me."

"I want to keep my old phone; when they change it, I am as lost as when I had my first cell phone. They keep putting more and more things on it that I don't understand or know how to use."

"New phones have so many things on them that mess me up. I always have to ask my grandson for help."

"Calling by WhatsApp was hard for me, but since I get it for free..."

"You can do everything with new phones, but I get tangled."

"The keyboard is a mess. It was easier for me with the button keypad."

"I prefer my old phone. I do not see the gray letters."

The values given by older adults indicate that they have the most excellent skill and confidence in using mobile phones, especially in making and receiving calls. This is mainly explained by the simplicity of the procedure and the frequency of use (4.25). This item shows a similar behavior according to gender, with a higher rating by men (4.4) than by women (4.1). However, according to Snedecor's F-test, the differences are not significant as the p-value is above 5%.

Although the other actions are rated above three, they do not reach the maximum of four, which shows that mobile phone use still needs to be better managed. Except for the use of the keyboard, there are no significant differences between the groups (p-value above 5%), which confirms that the skill of using the mobile phone does not depend on gender (see Table 2).

N° variable	Designation	Total sample	Gender		Snedecor's F
			Male	Female	
31	Make and receive calls	4,2596 n = 208	4,4020 n = 102	4,1226 n = 106	F(1,206) = 3,4821 p = 0,0635
32	Send and receive text messages	3,6202 n = 208	3,6569 n = 102	3,5849 n = 106	F(1,206) = 0,1441 p = 0,7046
33	Download and app use	3,3942 n = 208	3,3824 n = 102	3,4057 n = 106	F(1,206) = 0,0157 p = 0,9006
34	Surf de internet	3,7356 n = 208	3,7353 n = 102	3,7358 n = 106	F(1,206) = 0,0000 p = 0,9978
35	Take pictures	3,4760 n = 208	3,5294 n = 102	3,4245 n = 106	F(1,206) = 0,3513 p = 0,5540
36	Find and use the keyboard	3,6779 n = 208	3,8824 n = 102	3,4811 n = 106	F(1,206) = 5,3691 p = 0,0215

Source: update and expansion of Cuenca and Hoyos's (2016) database.

Table 2: Cellphone handling skills

Computer and Tablet Skills

The use of desktop and laptop computers, as well as tablet, is more complex for older adults because of the different steps that must be taken to perform different actions. The frequency of use is low, in contrast to mobile phones. The population studied shows a low level of dexterity in using these devices due to age-related characteristics such as slower learning speed and visual impairment. In addition, there is discomfort or fatigue when sitting for long periods. Finally, the insecurity and intolerance of the people in contact (children, adolescents, young people, and adults) for the explanations and instructions necessary for using such devices are an obstacle to improving the use of these devices.

"I have almost forced myself to use the Internet to communicate with my children who are away."

"I like the tablet because I can see better, but everything is still messy, and I always have to ask for help."

"I think all devices are good, but the problem is understanding and remembering what they explain."

"I prefer the phone with buttons for the keypad because it is easy for me to dial, and they are in plain sight."

"I use the computer, but I always feel insecure."

"Every time they update the computer, they must explain, and I feel less capable or stupid."

If I ask for help, I risk being laughed at, ignored, or told:

"Again! I have explained it to you already."

"Now everything is gray, and it is hard for me to find what I need."

The values show that all other actions are below four except for turning the personal computer on and off. Downloading files, pictures, and music on the laptop is very complex for the elderly (2.82). On the other hand, all actions related to the tablet are considered complex for the target population, as the values reach a maximum of 1.94. Table 3.

When analyzing the variables according to gender, similar behavior is observed using electronic devices, as the results are close to the overall mean. However, using Snedecor's F test, significant differences were found between men and women at the 5% level in turning on and off, using the laptop mouse, and taking photos with the tablet.

Regarding the skill in performing the other actions with both computers (personal and laptop) and the tablet, the significance level is above 5%, so it is confirmed that gender does not explain the difficulty/skill that the older adult has in using these electronic devices.

N° variable	Designation	Total sample	Gender		Snedecor's F
			Male	Female	
Laptop					
37	Turn on/off	3,5529 n = 208	3,2059 n = 102	3,8868 n = 106	F(1,206) = 4,6342 p = 0,0325
38	Use of the touch mouse	3,4519 n = 208	3,0882 n = 102	3,8019 n = 106	F(1,206) = 5,6047 p = 0,0188
39	Surf the Internet	3,2933 n = 208	3,0196 n = 102	3,5566 n = 106	F(1,206) = 3,2499 p = 0,0729

N° variable	Designation	Total sample	Gender		Snedecor's F
			Male	Female	
Laptop					
40	Download files, images, and music	2,8173 n = 208	2,6765 n = 102	2,9528 n = 106	F(1,206) = 1,1248 p = 0,2901
Personal computer					
41	Turn on/off	4,0337 n = 208	4,0392 n = 102	4,0283 n = 106	F(1,206) = 0,0013 p = 0,9717
42	Surf the Internet	3,7452 n = 208	3,8039 n = 102	3,6887 n = 106	F(1,206) = 0,1496 p = 0,6993
43	Download files, images, and music	3,3462 n = 208	3,4902 n = 102	3,2075 n = 106	F(1,206) = 1,0549 p = 0,3056
Tablet					
44	Download and use the app	1,8413 n = 208	1,6765 n = 102	2,0000 n = 106	F(1,206) = 2,1377 p = 0,1452
45	Surf the Internet	1,9423 n = 208	1,7353 n = 102	2,1415 n = 106	F(1,206) = 2,8283 p = 0,0941
46	Take pictures	1,9183 n = 208	1,6176 n = 102	2,2075 n = 106	F(1,206) = 6,3422 p = 0,0126
47	Find and use a keyboard	1,9135 n = 208	1,7157 n = 102	2,1038 n = 106	F(1,206) = 2,6586 p = 0,1045

Source: update and expansion of Cuenca and Hoyos's (2016) database.

Table 3: Personal computer, laptop, and tablet skills

Typification of Older Adults

In order to identify the different groups of older adults in terms of skills in the use of new technologies, the statistical technique of cluster analysis was used. This technique is applied to determine internally homogeneous but distinct groups by grouping smaller units or more significant segments (Santesmases, 2009). The top-down model was used, based on the Howard-Harris algorithm, considering the large sample size. Four groups were formed to obtain a sufficiently large segment size and homogeneous comparisons, as well as having two extremes and two intermediate groups.

Twenty-one variables were selected, related to older adults' level of understanding of the technical language of the technological devices and their ability to use specific functions of each device—Table 4.

The third grouping alternative was selected (with an explained variance of 58.48%), from which four groups were obtained. Considering the mean scores, groups 1 and 4 were identified as extreme groups, whereas groups 2 and 3 were intermediate groups.

LT-CEL	How well do you understand technical language?	Cell phone
LT-PC	How well do you understand technical language?	Laptop Computer
LT-PCM	How well do you understand technical language?	Personal Computer
LT-TAB	How well do you understand technical language?	Tablet
MAN-CEL1	How well do you use the device to make/receive calls?	Cell phone
MAN-CEL2	How well do you use the device to send/receive text messages?	Cell Phone
MAN-CEL3	How well it uses the device to download/use applications?	Cell Phone
MAN-CEL4	How well does the device use the device for surfing the Internet?	Cell phone
MAN-CEL5	How well does the device use the device when taking pictures with the camera?	Cell phone
MAN-CEL6	How well the device uses the device, find/use the keyboard?	Cell phone
MAN-PC2	How well does the device use the mouse when using the touch mouse?	Laptop Computer
MAN-PC3	How well does the device use the device for surfing the Internet?	Laptop Computer
MAN-PC4	How well does the device use the device to download content from the Internet?	Laptop Computer
MAN-PCM2	How well does the device use the device to browse the Internet?	Personal Computer
MAN-PCM3	How well does the device use the device to download content from the Internet?	Personal Computer
MAN-TAB1	How well does the device use the device to download/use applications?	Tablet
MAN-TAB2	How well does the device use the device to browse the Internet?	Tablet
MAN-TAB3	How well do you use the device to take pictures with the camera?	Tablet
MAN-TAB4	How well does the device use the device to find/use the keyboard?	Tablet

Source: own elaboration

Table 4: Variables related to technical language and the use of the functions of technological devices

Group 1. "Technically Skilled" Composed of 33% of older adults, this is the group with the highest number of positive variables. Members of this group show a good understanding of the technical language of the laptop, personal computer, and tablet. They can take pictures with a mobile phone camera and surf the Internet with a laptop. They find it easy to browse and download content from the Internet with their personal computer. When using the tablet, they have no difficulty downloading/using applications, browsing the Internet, taking pictures with the camera, and finding/using the keyboard.

Group 2. "Laggards" Consists of 25% of people. They need help downloading files, pictures, and music on the laptop. On the other hand, they find it easy to turn on/off the personal computer.

Group 3. "Semi-skilled" Consists of 17% of the elderly. They have a high understanding of the technical language of the mobile phone but need help understanding the technical language of the personal computer. They are proficient in using mobile phones to make/receive calls, send/receive text messages, download/use applications, browse the Internet, and find/use the keyboard. They are also comfortable using the laptop to download files, pictures, and music. They have no problems turning it on/off or using the touch mouse. However, they have difficulty turning their personal computer on/off, surfing the Internet, and downloading files, pictures, and music.

Group 4: "Outdated" Consists of 25% of older adults. This is the group with the most negative variables. They need help understanding the technical language of mobile phones, laptops, and tablets. They need help with the mobile phone in making and receiving calls, sending/receiving text messages, downloading/using applications, browsing the Internet, taking photos with the device (mobile phone) camera, and finding/using the keyboard. With the laptop, they have difficulty turning it on/off, using the touch mouse, and browsing the web. With the tablet, they have difficulty downloading/using applications, browsing the web, taking photos with the device (tablet) camera, and finding/using the keyboard.

Conclusion

Although older adults in the city of Cartagena are aware of the importance of information and communication technologies and their contribution to improving their quality of life by facilitating contact with different groups of people, having fun, keeping up to date, making different types of transactions, etc., they are lagging in the use of smartphones, computers, and tablets.

Due to the characteristics of their age, the learning process could be faster, as evidenced by the number of people who say they have little or no understanding of the technical language of computers and tablets. Their primary medium is the mobile phone, which they use mainly for telephone communication (making and receiving calls).

The difficulties are exacerbated by the design of the screens of the new devices, which present the icons in grayscale. These new screens force older adults to make a more significant effort to see or try to guess what is going on.

This opens up lines of future research in the use of each device.

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