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Uses of Digital Tools among the Elderly

Usos de las herramientas digitales entre las personas mayores

ABSTRACT

A «multiage» society needs the design and creation of new areas of learning and communication to manage the digital demands of the elderly. In this article, the relation of the elderly to information and communication technologies (ICT) is approached and two objectives are considered: to discover the technological resources they use and to objectively describe the types of usage that senior citizens make of ICT. To that end, a survey technique is used, with the results validated by means of discussion groups. The study participants consisted of 215 elderly people, all ICT users, and 7 discussion groups of 5 people each. The results indicate that the resources most widely used by the elderly are computers and the Internet, and the type of usage is grouped into 4 categories: education, information, communication and entertainment. There were no significant differences in gender or age although differences were found in the availability of these resources for private use based on the level of education.

RESUMEN

Una sociedad «multiedades» supone diseñar y crear nuevos espacios de aprendizaje y comunicación, capaces de gestionar la demanda existente por parte de las personas mayores. En este artículo, se aborda la relación de las personas mayores con las tecnologías de la información y la comunicación (TIC) y para ello se plantean dos objetivos: el primero va dirigido a conocer los recursos tecnológicos que utilizan y el segundo, a describir objetivamente los tipos de uso que estas personas hacen de las TIC. Para ello, se utiliza la técnica de encuesta, cuyos resultados son contrastados mediante grupos de discusión. En el estudio participaron 215 personas mayores usuarias de las TIC y siete grupos de discusión de cinco personas cada uno. Los resultados encontrados indican que los recursos que más utilizan los mayores son, los ordenadores e Internet y el uso que hacen de los mismos se ha agrupado en cuatro grandes categorías: formación, información, comunicación y entretenimiento, no encontrándose diferencias significativas en función del género o de la edad y sí se encontraron diferencias en cuanto a la disponibilidad de dichos recursos para uso particular en función del nivel de estudios.

KEYWORDS / PALABRAS CLAVE

Learning, active aging, cognitive stimulation, digital divide, digital literacy, elderly people, healthy living.

Aprendizaje, brecha digital, cultura digital, envejecimiento activo, estimulación cognitiva, mayores, vida saludable.

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1. Introduction and review of recent history

The aging of the population in the European Union is an undeniable fact, with more and more people reaching pensionable age by the year. According to the report «The elderly in Spain, 2006» (Institute of Migrations and Social Services), the number of people aged 65 or over was approximately 7.3 million, which represents 16.6% of the population. The forecasts of the United Nations for 2050 state that Spain will have the highest number of elderly people in the world, with more than 16 million, that is to say, more than 30% of the projected total population. In 2009, the life expectancy of Spanish women was 84.1 years and 77.8 years for men, making Spain one of the leading countries in longevity.

As Montero argues (2005: 36), if the 19th century was characterized by an «excess of life» (high birthrate and high mortality), the 20th century has seen the end of the demographic transition, the revolution of longevity and aging. The challenge for the 21st century will be to make longevity compatible with personal autonomy and social participation.

This phenomenon of the aging population has not gone unnoticed in Spanish society, and in recent years social pacts have been made at state and regional levels (National Gerontological Plan, 1992-97; State Council for the Elderly, 1995; Plan of Action for the Elderly, 2000-05; 2003-07), projects and programs (University Programs for the Elderly), with the aim of fomenting social protection, associationism and the participation of the elderly in society.

The exhaustive exploration and study of the aging process (through biology, medicine, psychology and education) allows us to understand and promulgate old age as a stage of life, with all its possibilities and limitations, like any other. In the aging process, attitudes are very important but so too are the actions to promote active aging. The World Health Organization (2002) defines active aging as the process of optimization of the opportunities of health, participation and security with the purpose of improving the quality of life in people as they get older. Active aging not only includes physical and mental health, but also participation in society and social integration, clearly establishing the rights of the elderly as citizens.

Getting old is not confined to a specific moment in life; aging is part of the sequence of human development, and so, considering old age as an on-going process paves the way for action and breaks down prejudice. The environment in which people grow up, live, socialize and relate appears as a key element throughout life. Surroundings rich in stimuli and possibilities

provide a healthy lifestyle which in old age is a source of satisfaction and quality of life. For that reason, it is necessary to create new models and action strategies to promote the understanding of old age as just another stage of people's lives, a period of growth and personal enrichment in which to learn with the help of ICT, which is an aspect for which the society must be prepared. As early as 1986 the European Commission's «FAST Report» warned of the dangers of technological innovation without parallel social innovation. Social division between different countries and within then is a clear example of the consequences.

Digital divide is the term used to express this idea. It quantifies the difference between countries, sectors and people that have or do not have access to the instruments and tools of information and the capacity to use them. As can be observed, it is a wide-ranging term with differences according to the context in which it is analyzed (economic, social, technological, etc.), but with the same intention: to explain why some countries, people or groups have access to the technologies of information and communication while others do not. This multidimensional character that defines the digital divide shows that it is a phenomenon that is neither quick nor easy to solve. However, there is absolutely no doubting the need to reduce these differences in favor of a society for all. ICT offer formidable opportunities for all members of society but it is necessary to know the needs and interests of all its citizens regardless of age to bring people and technology together.

Juncos, Pereiro and Facal (2006: 184-185) state that the use of communication technologies by the elderly leads to great possibilities of intervention (Charness, Parks & Sabel, 2001). Both in normal aging and in exceptional cases, ICT allow us to design cognitive training programs relating language, attention, memory and reasoning, and specific programs for speech therapy. ICT enable interactivity and feedback, offer security to the users due to their consistency, and many possibilities for expansion through their versatility, allowing users to enjoy a wide variety of visual and auditory stimuli. This favors the connection and the approach of the elderly to the new subjects and phenomena arising in society (social inclusion). Access to innovation and the new technologies is essential to avoid generational distancing and so that the elderly do not feel ousted from today's world.

To age does not mean losing the capacity to adapt to change nor a desire to live in the past. Juncos, Pereiro and Facal (2006: 185) affirm that in the normal aging process access to computers and the Internet

can contribute to the development of new social links, new windows on to the world and new tools of communication and activities of cognitive stimulation; it can also permit access to culture and permanent education and involvement in activities of social cooperation. To that end it is necessary to offer the possibility of education in the specific competences that ICT require and their appropriate usage. The way in which this educative process is carried out is crucial for the incorporation of senior citizens into the digital culture. In this sense, Huelves (2009: 56-77) mentions some elements that must be considered when developing digital competences in the elderly. These elements are: memory, especially at the time of recovery, for that reason a spiral methodology is a good strategy to use; psychomotricity, considering some guidelines on posture ergonomics in relation to the machine; development of learning, demonstrating patience and comprehension.

Studies carried out in Spain to learn what use the elderly make of ICT are few and far between, and for that reason our research objectives concentrate on discovering and describing the types of use that the elderly make of ICT, and the technological resources they mostly use. The hypothesis is confirmed: the access to and use of ICT among elderly people is positive since they are used in activities related to communication, information, education and leisure: everyday activities that provide new opportunities for relating to other people.

2. Material and method

The design of the research is a descriptive study whose objectives and methodology respond to paradigmatic complementariness given the nature of the phenomenon studied, which is largely unexplored, changeable and dynamic. The participants in the study consisted of 215 elderly ICT users from the Spanish region of Asturias who regularly frequent social centres for the elderly.

The research uses two instruments for data collection taking into account methodological complementa-

riness: a survey oriented to the gathering of information on the technological resources most widely used by the elderly and the usage they make of them; discussion groups that complement, contrast and enrich the data extracted with specific experiences and examples of ICT use.

The SPSS tool of statistical analysis and data processing (version 12.0) has been used for the analysis of the quantitative data. The analysis is fundamentally, a

Society has opened up spaces for the elderly to become digitally literate and they (although still not many) approach ICT with the main intention of learning about how they function (digital literacy) and to acquire the necessary basic competences for managing and using them for their particular needs, which will lead them to acquire computer knowledge and enjoy using that knowhow. This research shows that the elderly use ICT as a form of education; that these generations of the elderly need and want to learn, and see this moment in their lives as the right time to approach ICT.

study of two variables with the application of statistical decision tests: Pearson's Chi-squared test, Phi coefficient, Pearson's coefficient correlation, Goodman's Lambda coefficient and the factorial analysis of variance (ANOVA).

3. Results

The results demonstrate that the elderly are a heterogeneous social group, and the ways in which they use ICT are related to necessity and individual interests.

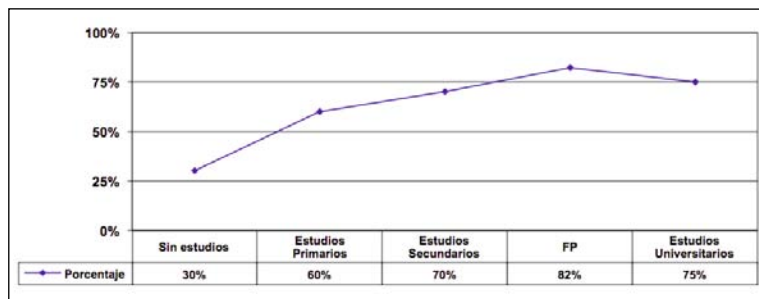
3.1. The technological resources most widely used by the elderly

The computer is the most widely used information technology (68.8%), followed by the Internet (50.7%), resources which are normally used in public spaces (52.15%). The results also show that elderly people with a higher level of education have greater private

Availability of resources and level of education	Value	gl	Sig. Asymptotic (bilateral)
Chi-square	17.498	6	.008

Table 1. Pearson's Chi-squared test for the availability of computer resources for private use and level of education variables.

use of information technology (in the home). The results of the χ^2 test reveal a significant association between the level of education and the availability of the information technology for private use.



Graph 1. Elderly people with private access to information technology according to level of education.

Graph 1 shows the difference between people who have private access to information technology according to their level of education.

The higher the level of education, the greater the access to computer resources. Significant relations regarding gender do not appear, however, as indicated by the Chi-square test [$\chi^2(1)=2.165$, $p>.05$], verified by the zero result of Goodman's Lambda = 0.000. The table of contingencies is as follows.

There are no significant associations with regard to age [$\chi^2(4)=5.663$, $p>.05$], marital status [$\chi^2(3)=6.646$, $p>.05$], type of cohabitation [$\chi^2(1)=1.599$, $p>.05$] and place of residence [$\chi^2(2)=1.165$, $p>.05$].

The most common information technology that elderly people possess for their private use is the computer (16.7%), and it is significant that 9.8% also have other ICT resources: printer, scanner, digital camera, digital video camera, multimedia materials and the Internet.

The level of education variable is also significant for access to other technological resources for private use, such as the mobile telephone. The higher the level of education, the greater the number of technological resources possessed by the participant.

The biggest differences are between the elderly who have no educational qualifications (68%) and those educated to, for example, primary school level (93%) or secondary school level (96%).

3.2. The use that the elderly make of ICT

The percentages are very clear with regard to the use that the elderly make of ICT: 66.1% cite educational activities: courses and workshops related to ICT (computer science, the Internet, digital photography, etc.), followed by 47% who search for information, as opposed to 18.7% who use ICT for entertainment, while 24.9% use it to communicate. These usage patterns do not differ greatly from those of other collectives or age groups. However, there are certain particularities which are described below.

3.2.1. Education

Nowadays the elderly tend to approach and use ICT for the purpose of learning about them (digital literacy) and in so doing

they acquire the basic competences needed to manage and use these resources that will enable them to learn and enjoy using them.

Significant associations between the personal and social-demographic variables do not occur, for example, the data show that gender does not generally influence enrolment on ICT-related courses and workshops. Men and women in equal number undertake this type of activity, mainly face-to-face in a computer science classroom with the guidance of an instructor. This is an aspect which we value positively in as much as this does not occur in other age ranges, as confirmed by Gil-Juárez, Vitores, Feliu and Vall-lloven (2011: 25-53), and although we can state that men and women have equal access to computer resources, inequalities become clear or even increase for the uses and knowledge of different types of ICT. Age being $p>.05$ is not a determining variable either, and the Phi

	Gender			Total
		Male	Female	
Availability of computer resources for private use	Yes	83	53	136
	No	39	38	77
Total:		122	91	213

Table 2. Table of contingencies for the gender variable and availability of computer resources for private use.

coefficient value is .089. Other variables that are not significant include marital status, the level of education, the type of cohabitation and the place of residence.

More and more elderly people are getting involved in information technology, which shows that it is possible to learn at any age and that their will to continue learning means that education is not limited to specific stages of life. To learn is to live, and learning fosters creativity, increases self-esteem, exercises the mind, etc. This is a guideline to consider when promoting the positive aspects of aging. In the words of Belando (2000: 37), quoted by Limón and Crespo (2001: 302-305), it is necessary «to look for new goals, new reasons for satisfaction and pride, a means to achieve happiness in this stage of life. Anchoring oneself in the past will only restrain development and accelerate decrepitude». Setting oneself the challenge to learn something new, in this case handling ICT, is a challenge, a new goal.

Simply learning to use the keyboard and the mouse means the acquisition of new skills. The functions require coordination, agility and natural automatism achieved through learning, as in handling the mouse, which requires correct and comfortable usage in a flowing but simultaneously paused movement, with the appropriate pressure applied to click on the left or right button, and control to drag and drop elements. Correct use of the keyboard requires the user to press specific keys, locate letters, manage cursors, find symbols, in short, it requires the development of different degrees of pressure and coordinated movements.

The data analysis confirms that the elderly generally attend ICT-related face-to-face courses and workshops specifically oriented towards their needs, as part of educational plans for senior citizens run by regional governments or city councils.

In response to the question «how did you learn to use ICT?» 60% indicated computer science courses and workshops; «where?» yielded a 96.7% response in favor of social centres for the elderly.

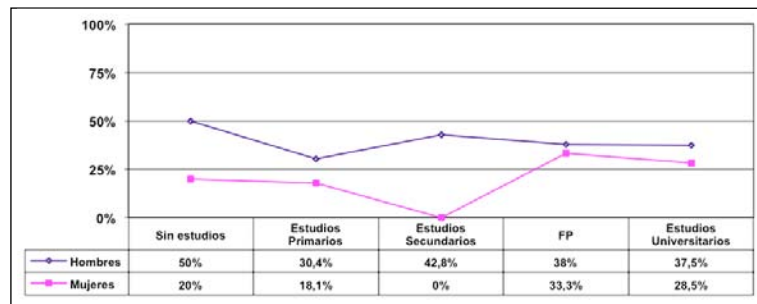
It is noteworthy that 29.6% of the elderly state that they use the Internet for educational purposes. The results from the χ^2 test indicate that there is no significant association for age [$\chi^2(12)=10.977$, $p>.05$], marital status [$\chi^2(9)=7.760$, $p>.05$], place of residence [$\chi^2(6)=9.717$, $p>.05$], type of cohabitation [$\chi^2(3)=6.113$, $p>.05$], gender or level of education, as seen in Graph 2.

The data show that women carry out this activity

on the Internet to a lesser extent than men, with the greatest contrast between both sexes at the level of secondary school education.

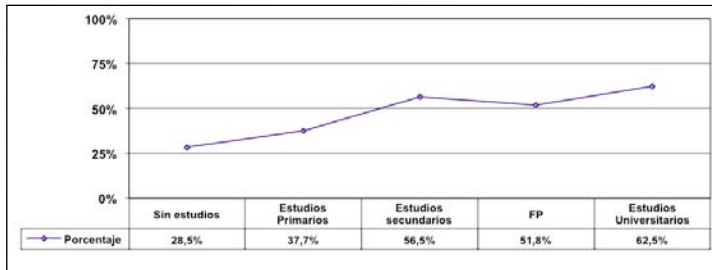
3.2.2. Information

Access to information is another of the common uses that the elderly make of ICT which is unsurprising when referring to the Information Society we live in (Castells, 1995). Information is now an essential resource for human activity, both socially and personally, and the elderly, as part of our society, also perceive computer science to be one of the great historical revolutions. «There is absolutely no doubt... computer science is, I believe, one of the most important revolutions of human life. Why? Because it has united the world. That is true globalization [...]. And I always like to be involved in non-violent revolutions... and then I got very interested in everything that it can offer me. Above all, information. I have access to immediate, trustworthy information when I know how to look for it and use it, and I am using it every day. Then the advantage is immense... it expands knowledge, the consciousness, and that is what we need [...]» (H).



Graph 2. Elderly people who use the Internet for educational purposes according to level of education and gender.

The Internet constitutes an immense source of information of all kinds: texts, photographs, graphics, music, videos, animations, computer science programs, etc., all stored on PCs connected to the Net and structured in diverse formats, such as Web pages, files, discussion forums, noticeboards, etc. Miranda de Larra (2004: 21) indicates that the elderly are generally interested in the same subjects as the rest of the population, but also in information with special relevance for their stage of life (pension payments, health, etc.), hence they demand that this type of information be made more and more accessible on the Internet. Electronic transactions are particularly useful for the elderly who are restricted by poor health or physical disability. The same applies to online shopping and banking for those with mobility restrictions or limited



Graph 3. Elderly people who often use the Internet according to level of education.

transport options. «Do the elderly habitually use the Internet?» Not all elderly ICT users go on the Internet on a regular basis, in fact 40.1% do not habitually use the Internet as opposed to 59.9% that do. Age, gender, type of cohabitation and place of residence are not decisive indicators in the frequency of Internet use by the elderly.

In relation to level of education the χ^2 test yielded $p < .05$ which implies a significant statistical association between frequency of Internet use and level of education. The percentages are shown in detail in Graph 3:

As can be observed, it is the elderly with secondary school-level education (56.5%) and university degrees (62.5%) who show make greatest use of the Internet, followed by those with vocational training (51.8%), primary school-level education (37.7%) and lastly those with no educational qualifications (28.5%).

Data relating to Internet use, the level of education and gender are interesting in that they emphasize the significant difference between men and women with no educational qualifications. Elderly women who left school with no qualifications (although not illiterate) make the least use of the Internet. This is important for the design of political strategies and social programs whose aim is to promote Internet use among this segment of society. In today's society it is essential to promote women's access and use of ICT as an empowerment measure, as stated at the Fourth World Conference on Women in Beijing (ONU, 1995). Empowerment means 'the full participation of women in conditions of equality in all spheres of society, including participation in the processes of decision-making and access to power' in Beijing (ONU, 1995). In relation to ICT, this requires the improvement of skills, knowledge, access and use of these resources. ICT use and application is much more apparent in the elderly women with a higher level of education.

«Why do the elderly use the Internet?» The main reason is to

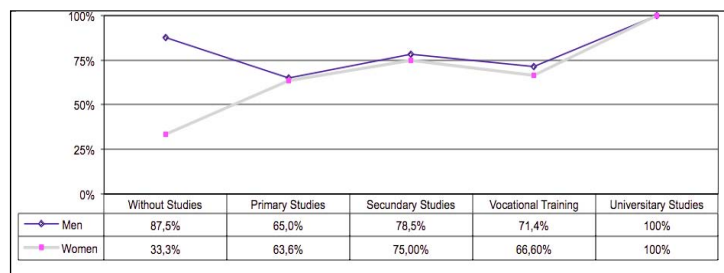
search for information, and they indicate that they do it often (35.5%) or a lot (27.9%). The least common activity is electronic banking (not at all: 80.2%) and administrative procedures (not at all: 82.6%). Those with a secondary school or university level of education use the Internet most often to carry out administrative procedures.

The elderly use the Internet especially to access information and are interested in the news and current affairs (reading newspapers online). «I, for example, lived in Germany for 9 years [...] here I download a newspaper that I used to buy there [...] and I flick through it almost every day [...] there are advantages everywhere, it's true» (H).

Accessing information can be beneficial for the elderly (preservation of cognitive capabilities, increase in the sense of integration in society, opportunity to learn, among others) and can be a source of immense personal satisfaction. According to a recent study (Small, Moody, Siddarth & Bookheimer, 2009) by the University of California, Internet searches stimulate and improve cerebral functioning by activating the main centres of the brain that control decision-making and the capacity to perform complex reasoning.

3.2.3. Communication

The value of communication is the same for anybody regardless of age, and is one of the fundamental pillars of life. We habitually communicate with other people and use different means to do so, and in this case 24.9% of elderly ICT users indicate that they use the Internet to communicate. There is evidence from the Chi-square test [$\chi^2(9)=18.066$, $p < .05$] to confirm that marital status influences communication by Internet, particularly its use among unmarried elderly men and women, and women in particular, as the following chart indicates.



Graph 4. Elderly people who often or sometimes use the Internet according to level of education and gender.

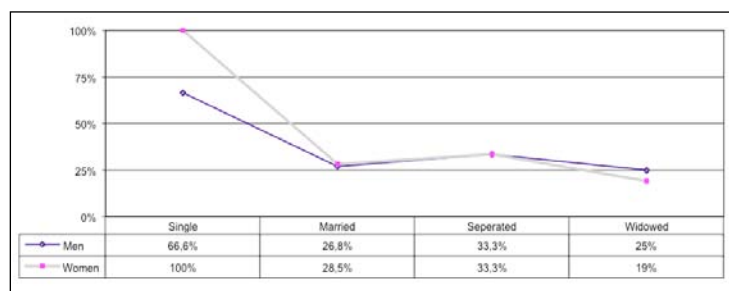
The elderly who participated in the discussion groups state that the Internet is a useful means of communication and that they often use it. The positive aspects of Internet use are that users can maintain a closer relationship with the family. One of the participants said: «It means everything to me, to communicate with the family... just the other day a niece that had recently had a baby showed us it on a Webcam» (H).

Contact with other people, especially relatives (children and grandchildren), is the type of use that stands out most. In this sense, Internet usage foment

opportunities for educational and constructive leisure for the elderly, as it is for other age groups. Opinions on ICT use for entertainment vary: «For me it's just a little entertainment like any other» (H). «There are things I don't need [...] what do I need this for? [...] Now for me the computer is just a hobby» (H).

Given the opportunities that ICT offer, it is difficult not to find a moment in which to enjoy them. Different ways for using them as a source of entertainment are: «Here for example, I believe that what we most use it for apart from the local rag [...] is to make

Powerpoint presentations, above all at Christmas, we send emails with presentations, then send them to each other and then there are others that sends us theirs [...] then we do things with photography, the ones that have got grandchildren are those who are most into it, for example it's a thing that I like most, and what I «spend most time on» (H). «I do a lot of photographs [...] then I make a video [...] it's something that I really like» (H). «Photo-



Graph 5. Elderly people who use the Internet to communicate according to marital status and gender.

intergenerational relations, so important for health and well-being. «I remember that the first mail that I sent I sent to my 'kid'... seeing that he answered me in just a few minutes made me think... and today I am 'ever so pleased' that I 'got into it', now I have a computer at home, I have connection to the Internet... and when he is away we keep in very close contact, see each other through a Webcam, chat ... if I hadn't 'been and done' it, I don't know, I'd be as bored as I don't know what, and yet now there are times when I don't have enough time» (H).

This two-way interaction in which both parts are involved in the communication relationship has positive effects for the elderly (increase in self-esteem and motivation, development of skills, especially social skills, escape from isolation, etc.) and is a reason for personal satisfaction.

3.2.4. Entertainment

The elderly people who took part in this research also use ICT to entertain themselves (18.7%), and this encourages an openness to alternative forms of leisure, personal enjoyment and self-fulfillment.

The Chi-square test indicates that age, gender, marital status, educational level, type of cohabitation and the place of residence are not determining variables in the use of the ICT as a source of entertainment. This area is still unexplored, with many oppor-

shop is also great, very entertaining and very pretty at the same time because it is possible to do many tricks with a photograph and that's wonderful» (H). «I have a group in Latin America and we are continuously in contact [...] you learn how they think in other places [...] for me, personally it is a very great inner satisfaction» (H).

These ideas reveal the wide range of ICT options for entertainment and the substantial changes in the leisure habits of the elderly. As we can see, it is not just about occupying free time to get through the day, but rather an attempt to extend the possibilities for learning, personal satisfaction and enrichment.

«I'm not a person for example who likes bars, there are some folk who love to spend hours and hours there and that is not my cup of tea» (H). «Anything with the computer is always more enriching than playing cards [...] it's much more healthy, more rewarding, more enriching [...]» (H).

Without a doubt, leisure is a factor in quality of life and well-being providing it satisfies needs; the elderly attribute benefits or properties to ICT that make them a self-sufficient leisure activity (Cuenca, 2004: 34-35). Self-sufficient leisure is an important, vital experience, an area of human development that stems from a positive attitude which induces action and is based on three essential pillars: a perception of free choice, an aim in itself and a rewarding sensation.

In one of the discussion groups, one person considered this stage of life (after retirement) as an opportunity to recover lost time, to carry out projects that could not be undertaken during other life stages and to try to do that vital project that was always put off for another time. «I always had all my life a thirst for knowledge. Because all my life I envied those that knew a lot [...] we were four brothers and sisters and I was the only one who had an itch to study [...] but I couldn't [...] now I love learning».

These quotes constitute an important reference for professionals who design programs for the elderly. The new generations of the elderly are independent people, full of vitality, with countless opportunities and with a profile of needs and interests that differ from what we are accustomed to. They look for something more in leisure than a mere human experience, and they want it to be valuable, rewarding and full of meaning. Csikszentmihalyi (2001, cit. Cuenca, 2004: 53) states that it is only possible for people to develop their unique human potential if they enhance their psychological complexity which, according to the author, is the result of two components: integration and harmonious participation with the social and cultural environment. ICT constitute an activity which endows leisure with multiple possibilities for creativity and initiative in the elderly.

As already indicated, the elderly use ICT to make photo albums for their children, digital Christmas cards for their friends, videos which capture special moments, etc. Without doubt these activities involve the elderly in their own life projects, fill them with confidence, satisfaction, life. The effects of learning to use ICT are, without a shadow of doubt, very positive for the elderly who perceive them as tools that enrich, that offer indispensable possibilities for feeling part of today's society. In this respect, comments include: «It is a very good activity and it helps the elderly a great deal... I am satisfied that at my age I can use computer science, I like it very much, I like it because we are with friends and we have a great time».

4. Conclusions

Society has opened up spaces for the elderly to become digitally literate and they (although still not many) approach ICT with the main intention of learning about how they function (digital literacy) and to acquire the necessary basic competences for managing and using them for their particular needs, which will lead them to acquire computer knowledge and enjoy using that knowhow. This research shows that the elderly use ICT as a form of education; that these

generations of the elderly need and want to learn, and see this moment in their lives as the right time to approach ICT. The purpose of using ICT for entertainment, as occurs in other stages of life, is displaced by the urge to access all types of information that can contribute to personal knowledge, except in certain contexts such as rural areas where probably due to the lack of other types of leisure initiatives, ICT are used much more frequently for entertainment.

The preference for face-to-face courses with suitable methodologies and teachers sensitive to their needs is the method preferred by elderly men and women users of ICT.

Another important element to consider is that elderly involvement with the Internet is still low-level since they have not yet discovered all its possibilities in terms of communication and information, or if they are have, they are not interested in taking advantage of them. The data verify that the elderly use the Internet to communicate, especially the unmarried who see this communication channel as a tool that facilitates relationships with others, with relatives or friends and acts as a brake on loneliness. It is also comprehensible that the elderly with a secondary school or university level of education use this resource more whereas elderly women with no formal education use it the least, a fact to be considered when designing social programs that target elderly women with no educational qualifications to get them onto the Internet.

Another significant aspect of the research is that more than half the ICT users access the Internet from public areas, normally social centres for the elderly, since they do not have computer technology at home, which suggests that if they did so, ICT usage would be greater than it is at the moment. In this sense, small grants for people over 65 to buy computer equipment and access to the Internet should be considered, as it has been for young people. All these aspects should be taken into account when designing training programs that satisfy the needs of different groups. Competences already acquired by users should direct the methodologies to be employed in such a way that the use of the digital tools of the 21st century is open to all ages.

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