

The Virtuous Circle of Use, Attitude, Experience and Digital Inclusion

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eAdoption refers to how people learn to become ICT users. "Digital inclusion" however is a more complex status, related to people's participation in communities and in other dimensions of society, based on knowledge. It refers to areas such as social relationships, work, culture, politics, and so on.

This paper looks at how to evaluate digital inclusion, using an analysis that considers not only individual factors but community and social ones as well, going beyond an eadoption perspective that is limited to a focus on skill-level.

1. The Knowledge Society

The Knowledge Society (KS) is a term commonly used in the social sciences (Krüger 2006). This concept attempts to summarise the social transformations that are happening today. The concepts of Information Society (IS) and KS are frequently linked; in fact a UNESCO document (2005, p. 28) presents a sequence of causality. Covi (2004) deconstructs the concept of KS, proposing a perspective from which KS can be understood as a revolution in the sources of factors of production, but also in a cultural and social sense. She brings together the concepts of IS and KS in a new term: Information and Knowledge Society (IKS). In this way technology and cultural ideas are combined and compared (Covi 2004, p.22) to hardware and software in a simile involving computers. Covi affirms that the KS "is a society where the basic capital is the collective knowledge and information, distributed in everyplace, continuously valued and in real time synergy". Internet (the network of networks) frequently springs to mind when we refer to KS and IS, but again, we should remember that network and information can be shared at different levels; hardware and software, IS and KS, technology and society.

Castells (2006, p. 27-75) states that societies have always been organised in networks, and that information has always been a key factor. What sets the present apart is the exponential rise of information and communication technologies. Castells calls this development the "informational paradigm". In this context, technology (the microchip and the network) and its capacity to process and transmit information is what has allowed change in the social structure to take place. He presents this change as a revolution, similar to other historical revolutions such as the invention of the printing press or the steam engine. However, as will be explained below, Castells is somewhat critical of the term *knowledge society*.

UNESCO (2005, p.27) recognises that the technological base leads in this case to what they call "knowledge societies", affirming that "the new information and communication technologies have created new conditions for the emergence of knowledge societies". Castells also acknowledges the important role of technologies in this changing society, but later qualifies this by arguing that technologies enable a "net society" not a "knowledge society".

Based on this difference in the concepts, meaning and impact of the IS and the KS, two contrasting ideas can be extracted to further understanding of social changes and how they can be related to individuals:

- The evolution of ICT has played a key role in how actors in today's society (citizens, companies, government) access and transform information. This new capacity and new ways of using technology we refer to as the IS.
- The use of ICT has brought about a change in how people learn, organise, defend their rights, access information, buy, build links with each other, socialise, create new contents, produce new channels of power (bottom up and horizontal as well as top down), etc. This change is so dramatic and far-reaching compared with any previous event that it is reshaping the social structure. We refer to this as the KS.

The bases of the IS and the KS are ICT. People use ICT directly, but not without involving an individual effort to learn to use, adapt and interact with the device in the appropriate language. Everybody would like ICT to be easy to use, convenient, error-free, easily connected to other devices and to communicate without losing data, and to quickly find what we are looking for. To make this work easier for the user, ICT designers and manufacturers follow the principles of functionality and usability in creating their products. For a device to work, it does not have to be attractive, comfortable or intuitive, although these factors would help the person that is going to work with it.

Two points of view emerge here: one the human perspective, and the other hand, the technology. These two perspectives have different aims and requirements, and both have to give way: people have to learn to use the technology, and technology must be also designed with concepts of usability in mind. The discussion therefore focuses on the *interface* as this is where humans interact with technology, and also where technology communicates with humans.

The evolution of ICT and their growing intervention in our daily lives means that more and more routines are now technology mediated. The interface is no longer a clear bridge that separates humans and technology. It is a fuzzy component that interrupts our perceptions as humans and that technology designers try to include in their specifications.

In this way, we shift from usability to new concepts like *virtual screen*, *simulation* (Turkle et al. 1984, Turkle 1999), *experience* and *symbolic communication*, where people are considering technological tools as an extension of their life: identification,

social enjoyment, creativity, etc. Now technology is more human than ever: it allows us to experience.

2. Usability vs. Experience

Software and hardware are designed for people to use; therefore, they should be user friendly (Nielsen 1994). Interface usability and accessibility are two parameters that facilitate human-machine interaction. Interest in these principles first arose in the 90s with attempts to make machines more convenient and intuitive for people. The term usability refers to the ease and convenience of use. The principle of accessibility focuses on making technologies easy for the disabled to use. On the other hand, the concept of *user experience* (Hassenzahl & Tractinsky 2006) attempts to cover the sensations, emotions and affect that devices awaken in people. Technology must be attractive, fun and stimulating. McCarthy & Wright (2004 p. ix) affirm:

We don't just use technology; we live with it. Much more deeply than ever before, we are aware that interacting with technology involves us emotionally, intellectually, and sensually.

A positive experience has a greater impact on people than a usable system. Based on Nurkka et. al. (2009) and McCarthy & Wright (2004, p. 34, p.80) it is possible to know, recognise and evaluate the sensations and feelings experienced with technology.

As science and technology have evolved, ITC modify two human related factors: complexity and experience. These two factors are subjective and depend on the individual's skills and willingness to engage with technology, in other words, aptitude and attitude, or at least this is an intuitive assumption that we might believe is true and logical, but we will have the chance to verify whether this is the case later in this paper.

3. e-adoption vs e-inclusion

In a world where technologies, tools and services are widely available, people can use and take advantage of them. When a person does not know how to use them, he/she can learn these skills. This is known as e-adoption, and it is commonly applied to contexts other than individuals, such as the use of ICT by families or companies in eBanking, eGovernment, eCommerce, etc. E-adoption means using, increasing skills and taking advantage of the possibilities technology offers. On the other hand, e-inclusion is a more complex status, related to participation of peo-

ple in communities and in other dimensions of society based on knowledge and relationships, work, culture, politics, etc. (Castells 2005; p. 7). In fact, an e-inclusion evaluation analysis would need to consider not only individual factors, but community and social factors, while e-adoption would only require an analysis of the level of skills to use a certain tool or service.

In the report “e-Inclusion: New challenges and policy recommendations” (Kaplan 2005), Viviane Reding affirms:

e-Inclusion is about using Information and communication technologies (ICT) to empower all Europeans. This means more than just increasing access and making services widely available and easier to use, although these steps are important. It means also assisting people to use ICT to make their lives richer and more fun and by helping them to participate more fully in their lives as members of their families, neighbourhoods, regions, countries and as Europeans.

Information and communication technologies (ICT) are becoming key enablers of modern life. They are used at work, in day-to-day relationships, in relating with public services as well as in culture, entertainment and leisure, and in community and political participation. Most public policies can no longer be implemented without them. ICT are the engine powering modern health policies, security policies, environment policies, etc.

In this context, e-inclusion is essentially social inclusion in a knowledge society. It goes beyond accessing ICT tools and services or even being digitally literate. A definition of e-inclusion should focus on people’s empowerment and participation in the knowledge society and economy: skills and competences (both ICT-related and regarding new ways of working using ICT), awareness and willingness, social capital and the means to grow it are also key factors of e-inclusion.

An e-included person participates effectively in all dimensions of the economy and society based on knowledge through the ICT. The relevance of a person in a community is key to determining whether he/she is included or excluded. His/her participation is a measure of his/her membership.

It should be noted, following Kaplan (2005, p.7), that a person who is not using ICT is not excluded, so long as this lack of use is voluntarily. Indeed, a sufficiently informed person who does not use ICT voluntarily could be e-included, but at least a basic use of ICT must be established.

Some of the indicators proposed to measure a person’s e-inclusion are:

- *Identity on the net.* In real life we have a name and surname; we may have a passport, an ID, a phone number and a postal address. That allows other people to contact us, and creates our identity: our childhood, work life, friendships and family. On the net it is also possible to have an identity—not necessarily a true one—but one that references us that may even be more faithful than the real one (Turkle 1984). This net-identity lets others know what we are like and enables them to contact us. Electronic mail is the most basic identification on the net, but there are many other ways of having an identity: blogs, albums, an alias in a forum, a nick in a wiki or a wall in a social network.
- *Virtual Communities.* In real life, an included person belongs to several communities; work colleagues, family, neighbours, classmates, etc. The virtual world also has communities; perhaps the most common are Facebook or Twitter, but those are only one kind of community. A person may also belong to a virtual community where he/she establishes emotional feelings and long-term relationships with others, regardless of whether she/he only uses electronic mail or enjoys posting comments to his/her favourite author in a blog.
- *Participation.* The net can be a place for action and creativity. When a person is aware of the impact of the net, he or she inevitably acts to correct a mistake s/he has spotted (or contacts the author). The net also broadens out individuals’ capacities in their hobbies, interests and curiosity, and gives them a space in which to defend their rights.

4. Information Society vs. Knowledge Society

Technological evolution in ICT is allowing far greater quantities of information to be transmitted, stored and processed than in any other period in history. This capacity, together with falling prices of devices, has given a large percentage of society access to the net, to download and upload information, and thereby create the IS. Computer Mediated Communication (CMC) and the new social structures that have been created have enabled the “net society” (Castells 2001, Castells 2006) or what other authors prefer to call the KS.

When a person is learning about ICT, he/she should first acquire the knowledge and skills to use the computer and the browser, tools and services, but will this person be aware of the potentialities and impact of these new environments that he/she is learning about? Will he/she be able to adopt the technologies to his/her daily routines and life, to a new group of friends, or

will he/she feel accompanied when s/he is alone? The KS presents a new social structure where ICT play a crucial role, but it is not enough to learn to use new tools: we must also understand them and use them consciously.

5. The new digital divide

The concept of the *digital divide* emerged in 90s to differentiate those who use ICT from those who do not. The digital divide created a risk of exclusion in the same way as illiteracy did some decades ago. Ballesterro (2002) defined this term as the technical capacity to access and use the net, in which broadband capacity played a major role. With increased broadband speeds, this concept has become obsolete, but it has been replaced by a new risk: the new digital divide is now a question of access, knowledge, skills, opportunities for use, experience and motivation (van Dijk & Hacker 2003). Bridging this gap is now more complex than the previous digital divide.

6. Research

EuroStat (2011) reports an increase of broadband Internet access in households from 30 % in 2006 to 68% in 2011. There are, however, large differences depending on the ICT user's age : 91% of 16-24 year-olds access the net at least once a week. That percentage falls as the age increases; 25-54 year-olds: 76 %; 55-74 year-olds: 40 %. It is not difficult to evaluate individual use of a tool or service; we only need to ask to how many hours the person uses and takes advantage of a specific tool or service. Evaluation of experience and e-inclusion, however, presents much greater problems.

There appears to be a negative correlation between age and use, but what about other variables such as attitude, experience and e-inclusion? We have drawn from the model devised by McCarthy & Wright (2004, p. 80) to evaluate experience. This model proposes four threads: emotional, senses, compositional and spatial-temporal. Similarly, the work of Nurkka et al. (2009) relates the experience

to values, meaning, affective state and emotion. To evaluate e-inclusion we drew on the concepts and definitions from Kaplan (2005) and other regulations from the European Commission. The aspects and questions applied in the questionnaire were taken from Esteller-Curto (2012).

A quantitative study was carried out on 95 people of different ages, all of them ICT users at different levels and ages ($\bar{X} = 46.9$, $\sigma_{\bar{X}} = 13.6$). There is a clear difference in use depending on age (as noted above), but when only citizens currently using ICT are considered, is there any difference in other aspects such as attitude, experience and e-inclusion? How can citizen e-inclusion be achieved?

7. Results

Figure 1 shows the relationship between use and aptitude. As expected, we found a high correlation. A person who uses ICT frequently has better aptitudes/skills, while the inverse is also true. Aptitude among seniors ($\bar{X} = 2.06$) and use is in general lower than among the younger age group ($\bar{X} = 3.04$)

Figure 2 reveals a lack of correlation between attitude and use; they are independent. In general, all respondents had a neutral attitude (not very positive, not very negative), and also, use was not found to depend on attitude. This may suggest that some people (considered to be resigned) have a negative attitude to

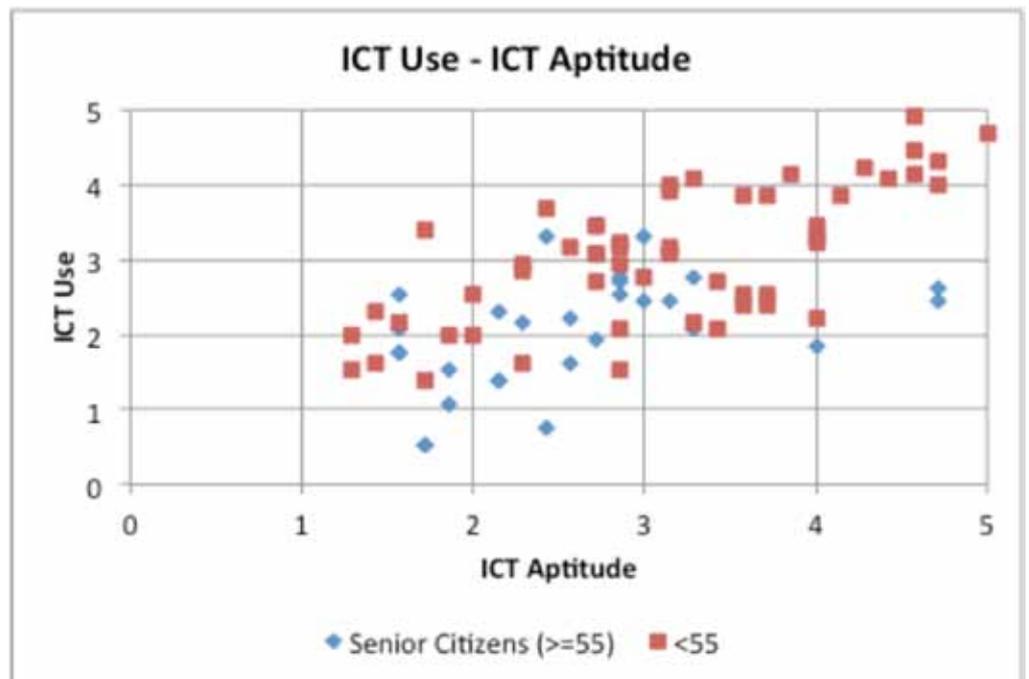


Figure 1: Relation between Use and Aptitude

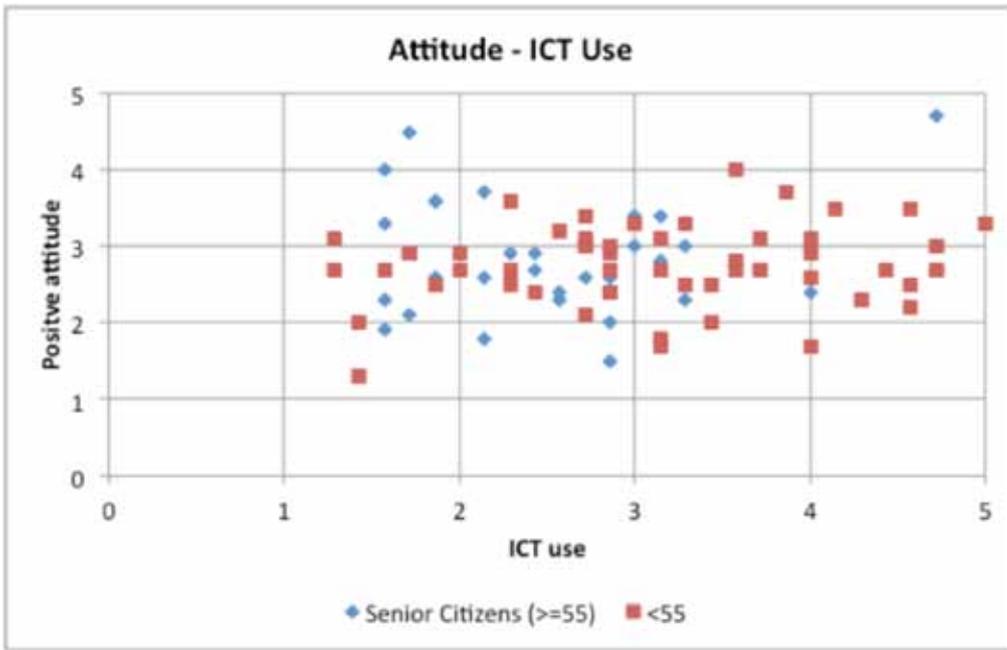


Figure 2: Relation between Attitude and ICT Use

ICT, even though they know how important technology is or they are forced to use it. On the other hand, some people are highly motivated, but have not yet reached high levels of ICT use, even though they are motivated.

The attitude in both groups is very similar (seniors: $\bar{X} = 2.85$, younger adults: $\bar{X} = 2.75$); in general terms they both appear to regard ICT as positive.

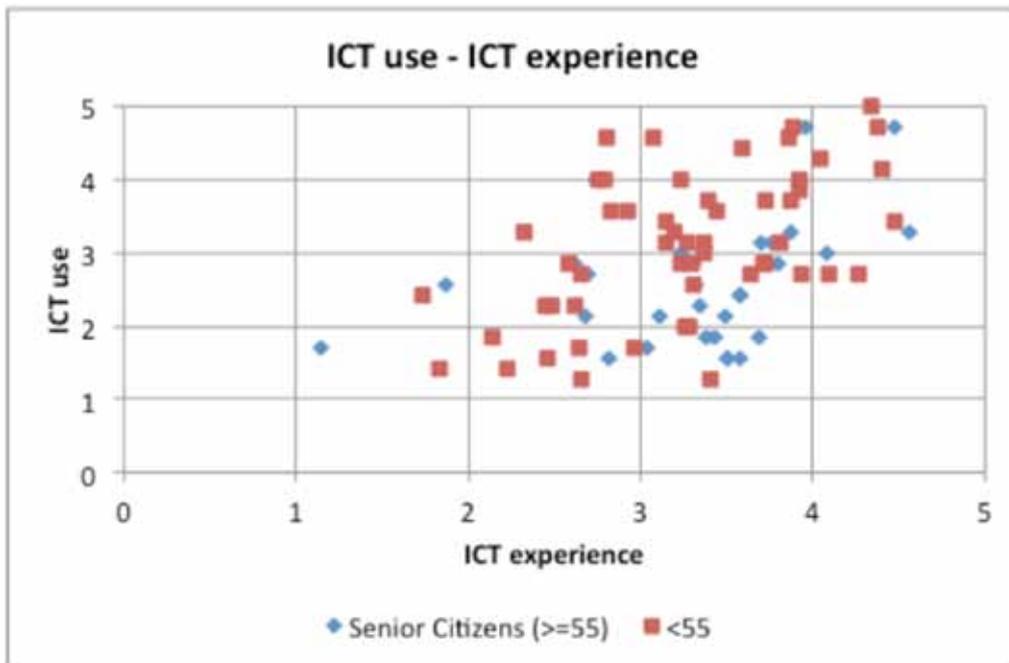


Figure 3: Relation between ICT Use and Experience

Use and experience (Figure 3) are highly correlated ($r=0.53$ in younger adults but $r=0.39$ in seniors). Considering both variables independently, seniors present a lower ICT use ($\bar{X} = 2.58$) although they have greater experience ($\bar{X} = 3.32$) than younger adults (use $\bar{X} = 3.10$, experience 3.25). It is difficult to understand how users can perceive some kind of experience without using technology directly, so this correlation is logical, but the difference between younger adults and seniors shows that experience in ICT is very subjective and can be based on other aspects, such as attitude, sense of usefulness, or seniors' needs and experiences.

Figure 4 shows no evidence of a relationship between ICT experience and attitude ($r=0.28$ in seniors and $r=0.22$ in younger adults, figures that are not significant). We therefore need to go back and explore the main difference in use of ICT between seniors and younger adults. An analysis of the survey data shows that 87 % of younger adults use ICT mainly at work (even though people were only asked about the use of internet

services and tools outside the workplace). They also use many banking, calendar and cloud services, while seniors are not significant users of these services. All respondents use services such as e-mail for private use, web browsers, search engines, social networks etc. These tools and services are more related to ICT experience than advanced tools.

Above, we explained that attitude and use are not correlated. There is little difference in attitude between seniors and younger adults ($\bar{X} = 2.85$ and 2.75), nor in e-inclusion ($\bar{X} = 3.18$ and 3.27). Figure 5 shows that the relationship between attitude and e-inclusion is not significant ($r=0.31$ in seniors, $r=0.44$ in younger

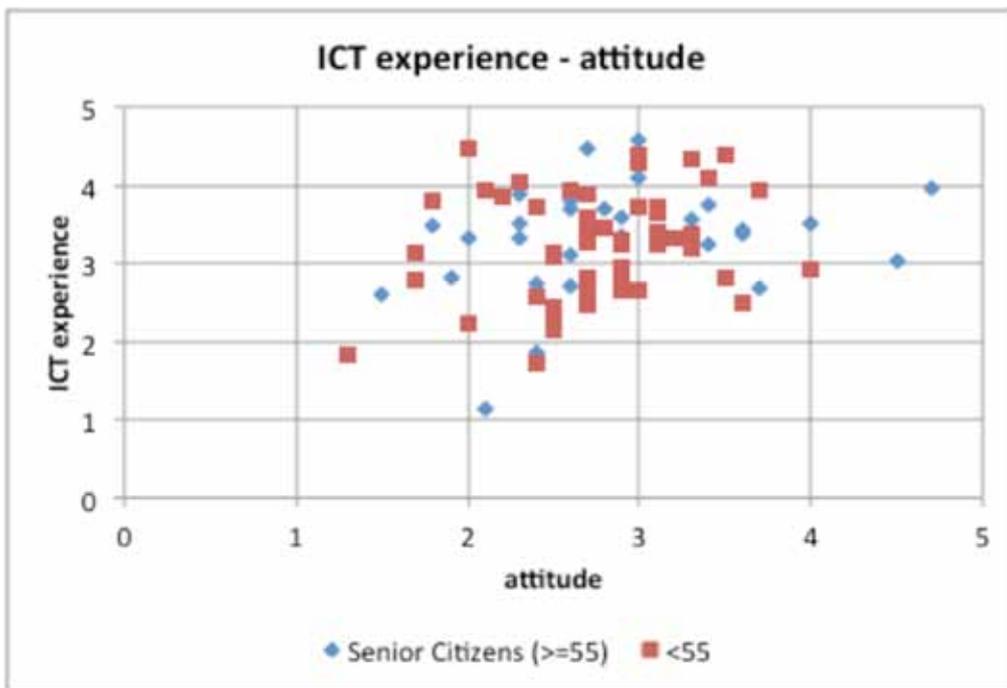


Figure 4: Relation between ICT Experience and Attitude

adults). From this data we can conclude that attitude does not seem to be important to a person’s e-inclusion. Use and e-inclusion have the strongest correlation (Figure 6), but it is still not high ($r=0.42$ in seniors and 0.46 in adults). This data leads us to form two hypotheses:

- a. Use and attitude are not related to e-inclusion, which would mean that a person can be e-included without using ICT or with a negative attitude.
- b. Use and attitude are related to e-inclusion, although this correlation is not very high, perhaps due to hidden variables.

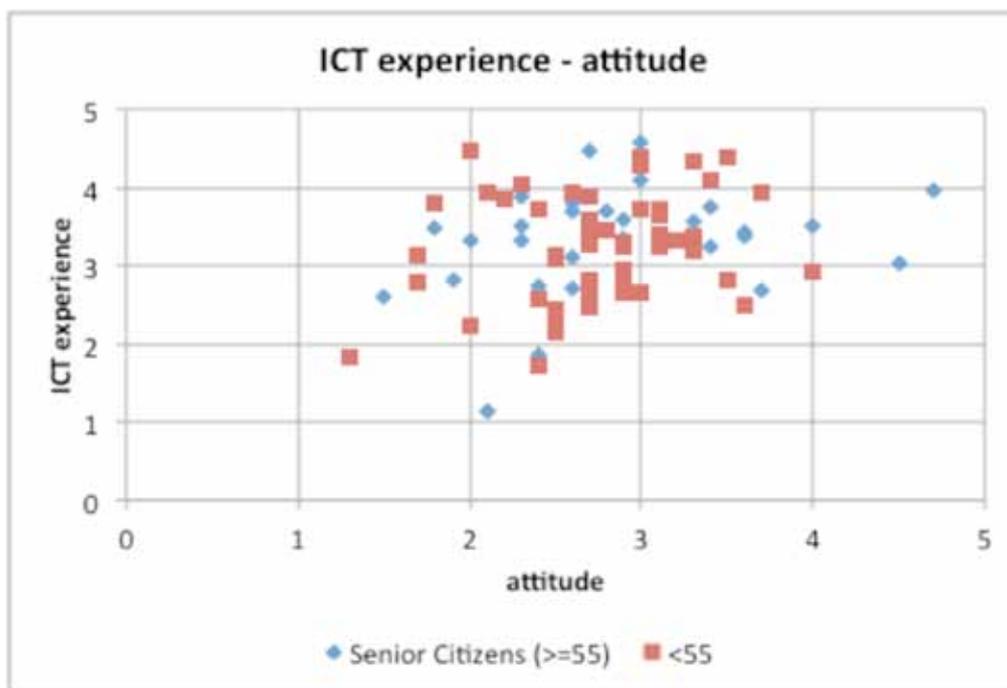


Figure 5: Relation between Attitude and e-inclusion

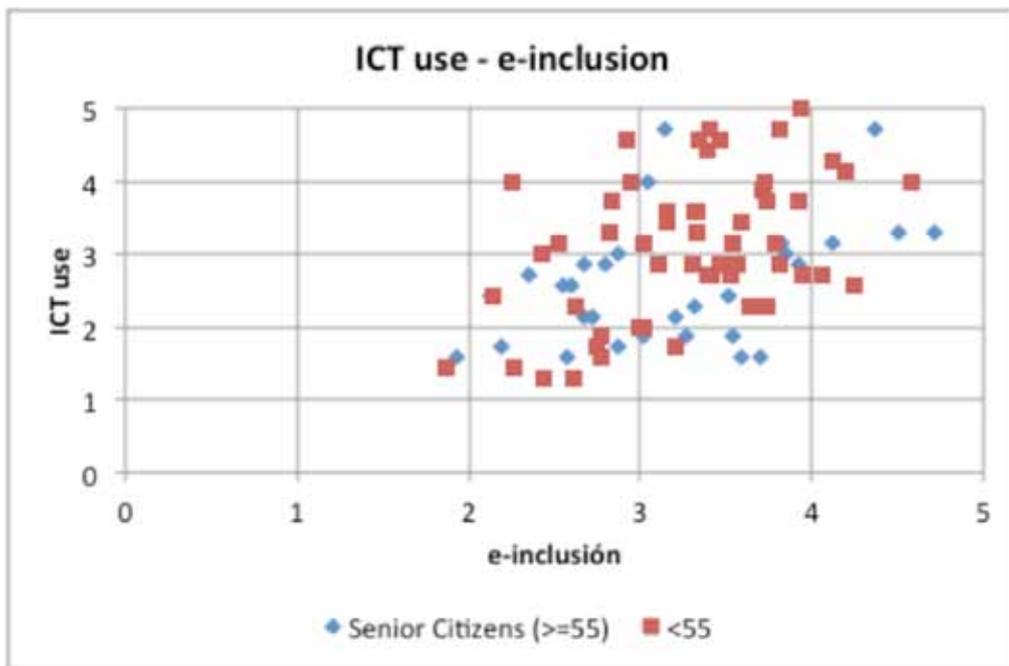


Figure 6: Relation between ICT Use and e-inclusion

Experience and e-inclusion have a slightly higher correlation ($r=0.65$ in seniors and 0.52 in younger adults), as displayed in Figure 7. These results support hypothesis b. An individual's e-inclusion is a very complex status that cannot be concluded from attitude and use only, although a combination of aptitude, use, attitude and motivation is important in ensuring that indi-

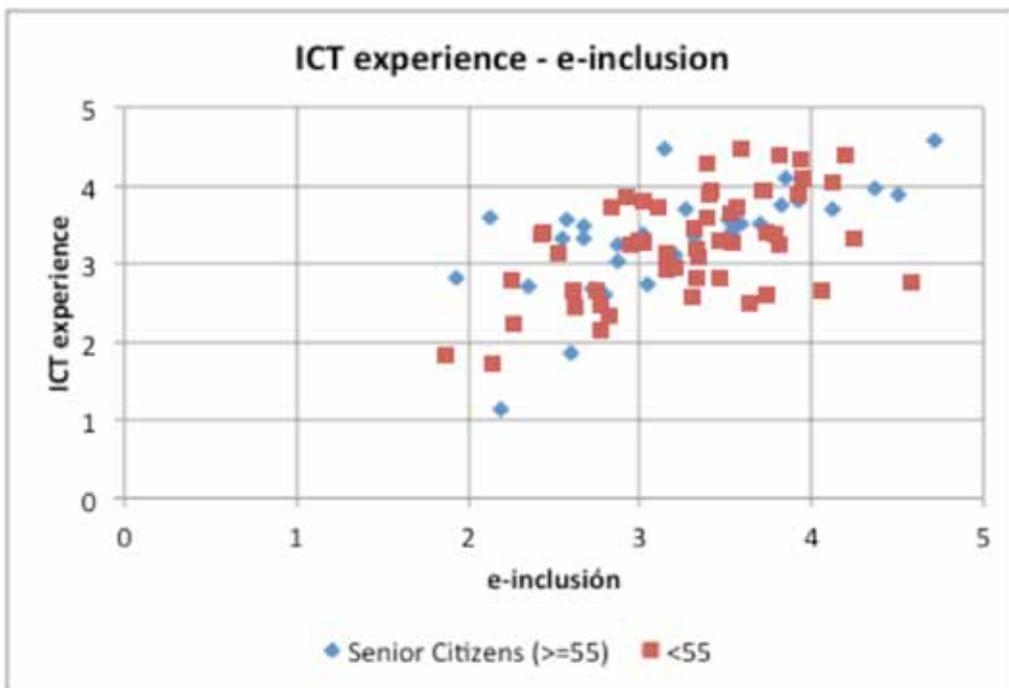


Figure 7: Relation between ICT Experience and e-inclusion

viduals enjoy, feel and experience in their use of ICT.

8. Conclusion

The concept of e-inclusion is related to being member of communities as part of the knowledge society and having an identity on the net. As explained above, this is a very abstract concept, and we need to have a clear focus in order to define it. The present study revealed a high correlation between frequency of use ($r=0.55$, $p<0.01$) and level of use of ICT tools ($r=0.57$, $p<0.01$). Attitude has no significant correlation with e-inclusion or experience.

From previous assumption, an individual's attitude is not important, but the use he/she makes of it. But what kind of use is important? Our analysis of the questionnaire results revealed that people who are capable of using advanced ICT tools (access to cloud services, use of a word processor) were more e-included, which at first glance may be contradictory, as these services are not commonly used to empower people in communities. However, in fact it does makes sense, because the most advanced users of this kind of tool are also high users of other basic, more social and creative tools. We can conclude that the more advanced a user of ICT a person is, the more e-included he or she will be. The way to become e-included, therefore, is to become a high skilled ICT user with broad aptitudes.

This suggests that when we want a person to be e-included we should teach advanced ICT tools. That is, of course, a fairly depressing thought. We can turn it around by proposing that only people with sufficient ICT skills can be considered e-included: reaching a high proficiency in the

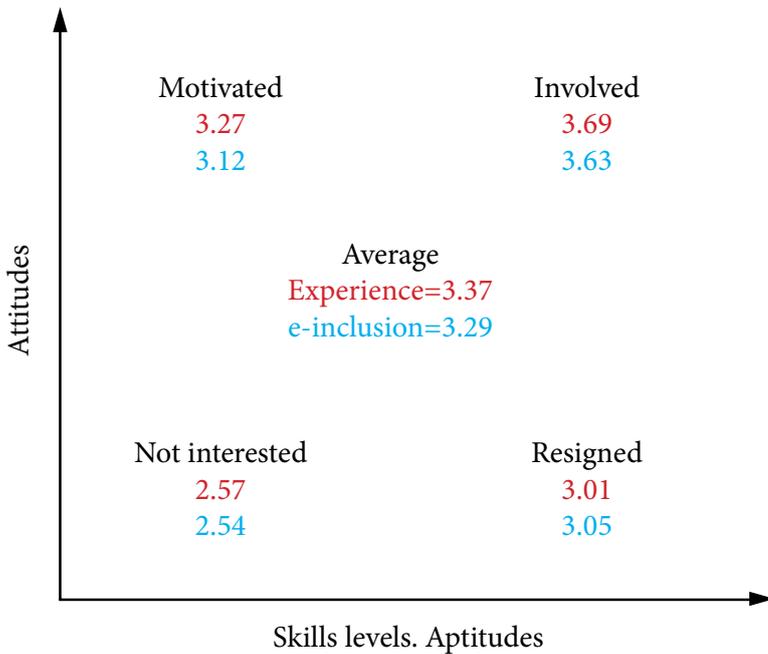


Figure 8: Classification of individual's experience and e-inclusion according to Aptitudes and Attitudes

use of ICT tools makes a person capable of being e-included. Is this a necessary and sufficient condition?

A person may become an advanced ICT user through the demands of their job, or in the case of a retired citizen (a senior) because of other motivations and pleasures found through using ICT. Motivation and attitude is not important for e-inclusion, but it is a very decisive factor. In fact, we find that attitude and experience play an important role in increasing use and aptitude, which in the end leads to e-inclusion.

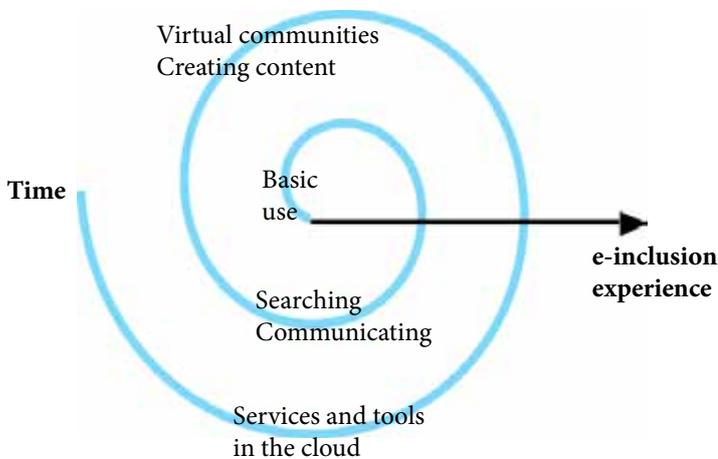


Figure 9: Virtuous cycle for e-inclusion

Based on the aptitudes and attitudes, users can be divided in four groups: not interested, resigned, motivated and involved. Figure 8 shows just how different people can be.

- Because of increasingly large numbers of tools and services now available on the net, fewer people fall into the “Not interested” group (as Eurostats reveals year on year). The reason given by seniors is that it is too complex (19 %) or too dangerous (28 %).
- ICT users may fall into the “resigned” group, which make their use of ICT very specific to cover their work related tasks in case of younger adults or, in case of seniors, because their friends and families oblige them (only 10% of seniors expressed this view).
- The “Motivated” group, even when they have less aptitude than the “Resigned” group, shows high experience and e-inclusion. We found that attitude is not related to experience and e-inclusion in the whole group, but we can see this relationship is on the rise among this segment of people.
- “Involved” users are those with a high frequency of ICT use, with greater skills and better attitude, which leads them to be more e-included.

Figure 9 shows the virtuous circle of e-inclusion. A person starts to learn and use ICT. If he/she is a senior citizen (retired), then this learning is not related to work issues but to other personal interests and social influence (friends, family). If the senior citizen is skilled in the use of ICT because he/she learnt previously, this does not mean that he/she does not have to learn new tools or services. If the senior finds the net useful and enjoyable, he/she becomes a frequent user. Then he/she starts to experience ICT and to be e-included. E-inclusion is not only a matter of frequency and aptitude, but also of attitude and experience, all of which increase together and have a synergy and feedback that again means the frequency, level of use, aptitude, attitude and experience increase together.

Only learning can make a senior be e-included, active, participative in the net and adapted to the knowledge society. However this statement should be clarified to avoid misunderstanding, because a senior will only keep learning if there is feedback from the above-mentioned factors that make this lifelong learning enjoyable, beneficial and fruitful, which drives the offer of an adequate learning methodology specifically aimed at seniors

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