



SenApp - Seniors Learning with Apps

539394-LLP-1-2013-1-DE-GRUNDTVIG-GMP

Document type:	Deliverable D2.1
Title:	Pedagogical and tutoring concept
Work Package:	2
Editor:	Pilar Escuder Mollón
Dissemination Level:	Internal
Status:	final
Preparation Date:	August 2014
Version:	1

Contributors

	Name	Organisation
1	Pilar Escuder Mollón	SCU
2	Roger Esteller Curto	SCU
3	Sonia Hetzner	ILI
4	Michael Zwanziger	ILI



539394-LLP-1-2013-1-DE-GRUNDTVIG-GMPI - This project has been funded with support from the European Commission. This communication reflects the views only of the author, and the commission cannot be held responsible for any use which may be made of the information contained therein.

Change log

Name	Date	Description
Pilar Escuder	10/02/2014	Deliver of the first draft of the document.
Michael Zwanziger	05/07/2014	final
Sonia Hetzner	15/07/2014	Review

SenApp Partners:



University of Erlangen Nuremberg
 Institute for Innovation in Learning
 Sónia Hetzner
 E-mail: sonia.hetzner@fim.uni-erlangen.de
 URL: <http://www.fim.uni-erlangen.de>



E-SENIORS association
 Monique Epstein
 E-mail: epstein@free.fr
 URL: <http://www.e-seniors.asso.fr/>



UNIVERSITAT
 JAUME·I

Jaume-I University
 Senior Citizens' University
 Pilar Escuder-Mollon
 E-mail: mollon@uji.es
 URL: <http://mayores.uji.es>



Grupul pentru Integrare Europeana
 Georgeta Chirlesan
 E-mail: g.chirlesan@gie.ro
 URL: www.gie.ro

Table of Contents

1. Introduction	4
2. E-adoption and Learning for Senior citizens	4
3. Benefits of Technology.....	5
4. The Use of ICT for Learning and Learning ICT	6
5. Pedagogical differences in senior citizens	7
6. The SenApp Concept	7
7. Desk Research, User Needs Analysis	10
8. Training Approach	15
9. Pedagogical Concept	16
10. Tutoring Guidelines	16
11. Summary and Follow-up	17
References	17



1. Introduction

This report is framed in the Work Package 2 (WP2) of the SenApp project. The main aim of this WP is to define the pedagogical concept of the SenApp project and to ensure that we produce a solution to make senior citizens go on-line, and not just a project about education on ICT and tablets. Based on senior citizens' requirements and needs, and on technology potentialities, we will propose a suitable training environment, the correspondent pedagogy and a first draft of tutoring guidelines.

The experience of the partners, current state-of-the art and a qualitative research is the main input of this deliverable. All this expertise and the information collected will be the foundations for the next work packages.

2. E-adoption and Learning for Senior citizens

Senior Citizens have traditionally been an excluded group of users of information and communication technologies (ICT); at least that is what statistics show comparing the different groups of population. According to Eurostat, in 2013 in EU28, there was significant divergence ('digital divides') according to age and level of formal education. 94 % of those aged 16-24 were regular internet users, more than double the proportion in the 55-74 age group (46 %). For the Population above 74 the usage is much lower.

Senior citizens usually become ICT-competent thanks to ICT courses, by asking family or friends for help and in some cases they become self-learners if they already had some computer and Internet basic experience. It is fair to acknowledge that two major advances have made the difference between 2004 and 2013, and it is expected to do so in future years. The first evolution has been on the increase of seniors' motivation and interest so they moved forward towards technology, the second change has been on the other side, where the technology now seems to be nearer to the seniors, thanks to the usability and services available. Also the learning process, due to a better pedagogy adaptation for this age group, has changed during the last years. both aspects are closely linked by a virtuous circle, this makes this change very powerful (Esteller-Curto et al., 2012). Also a suitable pedagogy makes seniors feel comfortable with ICT and increases seniors' interest, then there are more motivated to keep learning and using ICT, wanting to know and use it more.

Senior citizens are capable and enthusiastic in acquiring ICT-skills and gaining knowledge (Naumanen and Tukiainen 2009). They prefer skills, which are practical and applicable in real life, and they appreciate the social way of learning, like peer-tutoring. In addition, seniors are usually very active in the learning-teaching process; willing to contribute to participate in the proposal, design and activities development. It is thanks to the courses where seniors learn to deal with the computer, tools and services available on the Internet where they increase the ICT use (that is e-adoption), but we should not miss the fact that this expertise reached is only the first part of the lessons to learn and skills to achieve. The ICT is richer than a simple tool, it provides the availability of the experience (Chadwick-Dias et al. 2004). As said in McCarthy and Wright (2004) *"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 emotion- ally, intellectually, and sensually.”

So we can consider that the capability of feeling the experience on the technology as building a bridge to overcome the digital divide and get the e-inclusion. Around 2002-2006 the digital divide was produced by the lack of access to the broadband. Today, the new digital divide is produced because of experience, access, skills and usage access (Van Dijk and Hacker, 2003), so the increase of hard skills is only the first step, soft skills should be also taken into consideration when learning ICT.

Learning ICT must be understood as a learning experience, where senior citizens can start to use new tools and services being useful for them, but also enjoying, feeling that they can take part of the information society and increasing a the positive attitude towards new innovations and possibilities. This can be reached by putting (and increasing) on the ICT some of the ordinary real-life procedures and situations of communication, creativity, sharing with others and creating useful and valuable links with other people that can be then transformed to support networks, friendship or collaboration in common interests.

3. Benefits of Technology

The use of ICT by the general population should be seen as a tool that makes it possible to reach other aims: learning, sharing, creating, communicating, buying, etc. that is the most common use: the ICT seen as a tool. The perception of ICT can be seen by some people as something with so many possibilities, options and complexities that using them creates a stressful experience, among other negative sensations as un-usefulness and even sometimes rage. All those negative emotions then could lead to drop outs and rejection to technology, while the positive ones have made the technology to be so common in our lives.

Fortunately, the interfaces and usability facilities, make that using the PC, smartphones, tablets, etc. an enjoyable experience, beyond the use. We cannot separate this use of technology that would be directly related to the expertise of an individual but also with the experience (Chadwick-Dias et al. 2004), enjoying the technology, being comfortable and feeling it as a positive experience.

We should focus on both perspectives about ICT. First it is the useful variety of services and App that senior citizens can take advantage for their own profit, covering a need that they already had, make their life more comfortable. On the second place, the technologies give benefits to seniors because those make possible new opportunities for communication, creativity, expression and other basic need of the human mind. Although technology cannot substitute the person-to-person social interaction, it cannot be denied that those provide big potentialities for anybody, more for the seniors, as it happens for those that live in rural areas, are disabled or found that sometimes, the best way to communicate with their grandchildren is using the same technology-language.

The benefits that ICT provide to a person should be firstly associated to cover their basic needs and requirements, only by this way it is possible that the learners finds useful the technology, as it pro-

vides a good way to fulfil that need. Is in the second term, where the learner acquired habits and has a positive attitude, that can face more complex skills on ICT, skills not related to the use of apps or Internet services, but social skills, which are far more complex, but that provide also enormous pleasure and experience.

From most basic levels, the ladder to become ICT-competent drives also the learner through the benefits of ICT, making the learning an enjoyable but also a very fruitful activity. As said by the sociologist Castells (2006), the great difference that makes this period of time of any other lived before is the capacity of the people of creating networks, the computer mediated communication has established a new paradigm, also known as the information age or the knowledge society. The closed relation between the ICT, the present society and the networks make possible the individual to take advantage of new possibilities thanks to technology, those benefits should be learnt by stepping in that ladder:

Skill, competence	Benefit
Basic operations with the interface. Search and retrieve information and data. Receive and send messages.	Read information. Communicate with other colleagues, relatives and friends by sending messages.
Follow links, networks and social relations among people: creators or information and consumers	Discover, link information, compare, basic learning
Request and perform activities using the technology through the web, as buying, eBanking or eGovernment	Access to services, new information and services opportunities, access to rights
Give opinions, provide feedback, write comments and short public messages	Sense of public identity, self-fulfilment
Publish content (texts, images, video...)	Creativity, participation, recognition
Participate in social communities, collaborative networks	Learn, teach, give and receive support

4. The Use of ICT for Learning and Learning ICT

The double use of the ICT for learning ICT can make the learning process very challenging. In the SenApp project, we aim to use the tablet to learn to use the tablet, which makes impossible that a learner without tablet knowledge to go through the first learning units, as those learning units will be in the same tablet, and it is expected that some learners do not have the necessary skills even to

access the content. Therefore, a trainer, tutor or other classmate with good skills, should guide the first learning steps. In this case, the SenApp learning environment can mediate on this task, lowering the responsibility of the trainer or classmate, facilitating the learning in a guided way.

Even the use of the tablet for learning tablet create some difficulties on the methodology on which we are aware, it also provides benefits that can be exploited. It is the aim of the SenApp methodological proposal to lower those difficulties and increase the benefits, that proposal is detailed in further section.

5. Pedagogical differences in senior citizens

Each life stage has its own differences when learning, in childhood, teenagers, adults and seniors citizens, those differences are lead by two main factors: firstly is the fact that senior citizens are students with a huge life experience, that also makes them very heterogeneous. Secondly is the difference compared to the children, adolescents or adults in cognitive capacities and other possible impairments and disabilities.

There is a general thought that cognitive capacities decrease when getting older, this is not completely true, but they change. While the fluid memory decreases, the crystallised memory increases. This is the long-term memory and other skills acquired after a long life of experiences. The huge living experiences make possible the application of different pedagogies, and include concepts such as self-directed-learner, experiences-based learning.

In ICT learning, Senior citizens are directed by personal motivations. Their interest to learn how to use ICT is not driven by professional aims or competitiveness. It is necessary to underline that the source of that need is originated by internal factors (curiosity, pleasure, self-development, hobby, etc.) and external factors (as their family, need for managing eBanking, eGovernment, etc.).

Usually seniors are not digital natives (born after the widespread adoption of digital technologies). Even for senior citizens that have been working with computers, present services, tools and gadgets makes necessary an adaptation and new training. There are theories that even affirm that today's digital natives, will require in the future an adaptation because of always changing technologies and also always changing personal situations and life needs. Therefore, learning ICT must be understood from double perspective, not so centred on if a person has ICT experience and knowledge, but more user-centred; which are our needs now or in the future.

6. The SenApp Concept

SenApp project aims to create a learning app for seniors to support them to become ICT competent using a tablet. This project recognises the clear need of increase the involvement of seniors in the information and knowledge society (that is e-adoption and e-inclusion), by applying the ICT as a medium as well as a learning content.

To reach previous aims, a roadmap should be followed, starting from the non ICT user to reach the digital inclusion (that is the e-inclusion). This is the roadmap proposed that will be tested after the design of the prototype

- Discovery of the technology, awareness of the Internet potentialities, general knowledge about the possibilities and understanding how can I benefit of those. The milestone would be to reach the awareness.
- Learning to use: the interface (that is the logic, language) the possibilities (with most basic tools and services), and uses (to incorporate to own daily life routines). The milestone would be to reach the e-adoption
- Learning to discover, to try, to learn by one self and to learn other subjects, to share, to gain security and confidence. The milestone would be to gain expertise and decide whether is something is useful or not
- The last step in the learning roadmap is to reach the digital inclusion. That is to have a positive but also critical thinking about the technology and their relation in society, to have skills to create networks between members of the society (could be family, friends, or associations), or to influence others (media, power) or create and collaborate (share the expertise and help to build and participate in the construction of the knowledge society), experiencing the ICT

When talking about the ICT, it becomes common to think about computers (as PC or similar) and the Internet (mainly surfing, mailing), but it is important to point out that what has made the ICT so important in present society are not the machines or the network it self, but the way that the people uses it and how we use it to connect people, knowledge or information. In fact, the sociologist Castells (2006), prefers to call this society as the net-society thanks to the high connectivity that exists between information creators and information consumers. The computer mediated communication then becomes new way, with new capabilities of human interaction interfaces.

In the SenApp project, we have centred our efforts in the Tablet gadget, because it allows a new level of interaction never seen in computers and that affect the learning process and also the experience of the users. We do not aim to focus on smartphones although it is possible to link some of the skills and competences necessary to use both gadgets, even both share the same operating system (iOS in Apple, and Android on Google based systems)

It is important to remark the characteristics of Tablets from two perspectives, as a justification (the reason SenApp project is centered on tablets) and also the potentialities (as its role to make possible the e-inclusion of seniors and reach the ICT-benefits)

- Interface: Compared to the PC, the tablet can be managed using the most primitive tool that the human being has ever had, that is their fingers. The keyboard, and the mouse make de need to learn an artificial language used to manage the computer. Words like click, double-

click, right-click, cursor, shift, etc. represent actions that the learner should be aware to apply, but also to know when to execute them. The tactile interface of the tablets, make it simpler, using the human gesture of pointing with the finger. It is easier to learn, and more natural; this makes the barrier between technology and human to dissolve.

- Of course, it is still necessary to be trained to use certain gestures, and what icons mean, how to change basic settings, how to search and install apps.
- Unfortunately, there is one lack on the tablets, that is that those are difficult to be used for writing large texts, but those can be substituted by accessory keyboards, if necessary.
- Portability. Nowadays, laptops have become very light and easy to carry everywhere, we can buy netbooks lighter than 1 kg. Never before, personal computers has been so portable, even that affirmation difficult to reject, the laptops are not really portable, as it can be observed in an ordinary day: in a bus stop, in a line, while waiting for somebody, in a restaurant, etc. it is easier to see somebody spending time with a tablet than with a laptop. The tablet can fit in a handbag or in an ordinary suitcase (not laptop-suitcase). It is a gadget it is not strange to carry with us and use with us. It is starting to become common to see in the classrooms, museums, to be in contact using virtual communities while being in the hotel or in airports. Note that a businessman surely would carry a laptop in an airport or hotel, but a tourist, prefers to use a tablet.
- The tablet (or big smartphones) has become then not only the most portable gadget, but the most personal Internet connection. It allows us to be connected to Internet everywhere. No matter where you are, if you have a doubt, a problem, or simply you want to share something with your friends, you will probably get a connection to the Internet. A proof of this is how common is becoming to get a free wifi in restaurants, commercial malls, and other public buildings.
- Connectivity: The use of instant-message programmes or photo-sharing programmes are very enjoyable, those allow sending messages to our friends and getting in contact about what they are doing, sending a photo of where we are or what we are enjoying. We are doing this kind of communication with our friends because we expect from them that they be connected. Even if this kind of communication is useless (without a purpose) that makes possible to create links between people; everybody is connected, everybody is available.
- The fact that we carry always the smartphone and it is always connected to the internet opens news opportunities for communication never seen before, that is the share-capabilities in our connected community.

The use of tablets and smartphones g our life, making us to be continuously connected, to quickly search for information, get in touch with others and contribute to social networks

7. Desk Research, User Needs Analysis

Interviews were carried out following the Focus Groups methodology (Barnett, 2002). The template for the interviews and methodology followed can be seen in the Annex I. The total people reached is following:

- ILI: 7 non-users, 5 users and 2 trainers
- eSeniors: 3 non-users, 3 users, 3 trainers
- SCU: 12 non-users, 8 users, 3 trainers
- GIE: 6 non-users, 4 users, 2 trainers

Being a qualitative interview, main ideas were extracted, taking into consideration firstly the most common among all the population, but also the ones that were considered more interesting based the aims and context of the project.

Table 1. Obstacles found, difficulties. Replies from trainers

<p>New learners' attitude: fear of being unable to use it, fear of low security</p> <p>Differences between seniors, pre-experiences</p> <p>Being afraid of making mistakes</p> <p>Being afraid of forgetting</p> <p>"Retired teachers learn less than others" (ILI)</p> <p>Problems with tactile screen (at the beginning)</p> <p>Learners question "Will it be really useful for me?"</p> <p>Differences in tablets versions that learners bring to classroom (SCU)</p> <p>Two needs for basic and advanced levels with different human/technology weigh (SCU)</p>

Table 2. How increase motivation on learners. Replies from trainers

<p>Practising and showing (almost everybody)</p> <p>Identification of interest</p> <p>Demonstration of possibilities</p> <p>Showing videos</p> <p>Make things as simple as possible</p> <p>Thanks to the workshops (SCU)</p>
--

Table 3. Apps/Services more used. Replies from trainers

<p>google searches, Youtube (GIE)</p> <p>Email (ILI, SCU)</p>

In general: books, maps, contacts, dictionaries, news, magazines, broadcast, weather forecast, radio, (all)

Dropbox Siri, Groupspro, Skype, Citymap, Taurus

Table 4. Apps/Services more used. Replies from trainers

google searches, Youtube (GIE)

Email (ILI, SCU)

In general: books, maps, contacts, dictionaries, news, magazines, broadcast, weather forecast, radio, (all)

Dropbox Siri, Groupspro, Skype, Citymap, Taurus

Table 5. Suggestion to new trainers. Replies from trainers

pace: "Slow, slow, repeat, repeat", patience

To be calm

Motivate by showing

Many daily life examples

Remember that seniors are learning because they enjoy it (make an enjoyable experience)

Table 6. How to make learners more independent. Replies from trainers

Starting by taking classes

Repetitions, exercises

Loosing fear

Do not seek for apps, ask others (ILI)

Table 7. Benefits for senior citizens. Replies from trainers

For the seniors

- To be much more up-to-date
- To become independent
- To discover new knowledge and useful information
- It is lighter

Perceived from the seniors:

- Self esteem, satisfaction
- Stay in contact with family, social networking, membership in virtual communities

Table 8. Recommended tools. Replies from trainers

<p>Good ICT manual Presentation with steps, clear slides, printed materials Videos Courses with intensive support and tutoring Method: theoretical (concept) and practical. Later exercises (students should practise at home and come to class with questions)</p>

Table 9. PC-expertise, attitude. Replies from users

<p>expertise</p> <ul style="list-style-type: none"> • Almost everybody have a PC and internet • Uses: Information, communication, reading, news, music, games and e-mail <p>attitude</p> <ul style="list-style-type: none"> • Everybody feels enthusiastic or interested (ILI, SCU, eSenior) • Feel comfortable, as a hobby, enjoying

Table 10. Motivation and interest, method for learning. Replies from users

<p>Interest</p> <ul style="list-style-type: none"> • Stay in contact with relatives, searching, reading (ILI, SCU) • Friends and family has been the main motivation • PC is for working, tablet for enjoying (SCU) • As a PC abroad <p>Method of learning</p> <ul style="list-style-type: none"> • Relatives, courses (ILI, SCU) • Being curious, by myself (intuitive, discovering) (eSenior)

Table 11. Property of the tablet. Obtaining method, satisfaction. Replies from users

<p>Property</p> <ul style="list-style-type: none"> • Usually they do not own a tablet (GIE) • Nearly everybody own one (ILI, eSenior) and it is Android (2/3), or Adroid/Mac 50/50 (SCU) • Usually it is has been bought by my own or on request

Satisfaction

- Very happy (99 % ILI, SCU, eSenior)
- I wish my wifi was faster (eSenior)
- Not quite happy when there is not a Wifi Connection

Table 12. Reason for using. Replies from users

It is portable (a lot)

Surfing

Traveling

“For everything we can do on the internet” (eSenior)

Gaming (1) or let my grandsons playing (3)

Writing (!)

Speech recognition

Table 13. Needs. Replies from users

To know much better about the tablet possibilities

To know all the apps available that could be useful for me

To increase the security during surfing and other services

Table 14. Frequency and place of using. Replies from users

At home (nearly everybody)

During travels (some)

“Everywhere, always with me” (3 in SCU)

Daily (nearly everybody)

Table 15. Connection with other devices. Replies from users

Usually they do not connect the table with the PC/laptop (2/3)

None has a tablet with SIM, they connect with Mobile (or would like to learn how to do)

Few have installed a Cloud service for photos

Table 16. Expectation, desires, hopes. Replies from users

Learn more things
 Browse better the internet
 To have a better internet connection
 A cleaner tablet (Android user, eSenior)
 To become simpler (iPad user, eSenior)
 To try to solve some errors (e.g. opening some pages or videos, Android user in SCU)
 To use the Cloud (SCU)

Table 17. Preferred learning place. Replies from users

With a trainer/course
 With a trainer with a lot of patience
 With lessons available (even mandatory!!, eSenior)
 Alone and with a trainer
 Alone, not being afraid (5)

Table 18. PC-internet ownership and knowledge. Replies from no tablet users

Usually they have a computer and consider they have enough/good expertise (SCU, eSenior, ILI)
 The computer is usually shared by the husband/wife
 usually none although some would be accessible at home (GIE)
 Not use at all (2 at ILI)

Table 19. Level of knowledge about tablets. Replies from non tablet users

- Zero, none (50%)
- They heard about it: it seems they know what those are useful for (50%)
 - Easy to use, handling, touchable, for surfing, gaming, reading
 - The same than a PC (nearly)

Table 20. Reason not learning/using tablets. Replies from non tablet users

It seems too complicated (windows, touchable)
 It is difficult to read on the screen
 Fears, security, data loos, privacy
 It seems too complicated
 What is it useful for ?
 It would be nice to have a mouse (!)

Expenses (1/4) Time restriction (only one)

Table 21. Reasons to start using tablets. Replies from no tablet users

<p>I heard those were easy to use and read I had help or good training I knew the added value of the tablet I had a good book (in paper!!) that I could learn from It had a mouse/keyboard It has internet: wifi/3G</p> <p>Expected use: books, email, photos, communicate with relatives/children, information, magazines, reading, radio, tv, information, to use being away, to connect to internet</p>

8. Training Approach

In the SenApp project tablets (iOS or Android based) will be used to support senior citizens to learn how to use a tablet and take advantage of different apps. Senior citizens are supported to become self-directed learners in their educational process. This arises some pedagogical challenges:

- Our teaching experience would advise to use another learning environment (TV, book, PC, projector, other tablet) while the learner tries step by step the task
- Rely on short term memory of the senior learner is very risky
- What to teach first? The virtual learning environment or the tablet interface? (both are simultaneous)
- Full virtual learning environment loses real human contact (and this is really appreciated by senior learners)
- That can lead to failing in motivation, encouragement and even learning effectiveness

But with following potentialities:

- Greater impact
 - No distance limitation
 - No time limitation
 - Easy reuse of materials
- Virtual community
 - To get and give help
- As a learner
 - Own pace and possibility to reuse

- Learning APP is a perfect complement for ordinary courses

9. Pedagogical Concept

Based on previous defined situation and needs of senior citizens and the specific context of ICT learning, and the roadmap defined before, the pedagogical approach should be to divide the course in teaching units, from the most basic and low level skills and competences to the most advances and more abstract. Thanks to this it will be possible to reach e-adoption and later e-inclusion.

The training app has to fit following requirements inspired by Andragogy principles and inspiration from Connectivism theory

- Senior learners should know the purpose of what they are learning. Therefore, each teaching unit, should have a clear aim, but also it should explain why it is important and the expected benefit
- It should use the life experience of the learner covering needs and show examples that could be applied to their own life
- It should respect previous or lacking knowledge
- It should include different types of media to best support to overcome learning barriers such as age-related impairments
- It should be based on a step-by-step concept
- It should support the building of a social group and promote exchange across a group
- It should be simple and referring to real life activities and problems
- It should be supported by interesting scenarios
- Exercises and repetition need to be included
- As well as self-testing and self-assessment aspects
- The learning materials should follow a certain pre-defined sequence
- Learning units should be self-contained.

The methodology will not be restricted on a single pedagogy but it will try to adopt the most appropriate elements of each approach to support the use of mobile learning and training.

SenApp will develop a non-formal, flexible and accessible App-based ICT qualification course that matches the very specific needs of this highly heterogeneous target group. Furthermore, the use of eLearning as training mode will best support flexibility of content and learning schedule, which is a fundamental requirement of training offers for this large and much diversified group.

10. Tutoring Guidelines

The tutoring guidelines will focus on organisational aspects, communication in synchronous and asynchronous, one-to-one and one-to-many and they will clearly explain the training situation and the give indications on the support needs. The learners will be organised in Peer-groups of 5-10 learners. The tutoring guidelines will be further elaborated in the scope of work package 5 “Testing and piloting”.

11. Summary and Follow-up

This document gives an overview of the User Needs Analysis results and first indications on the pedagogical and didactical concept to be followed. The follow-ups documents are 2.2 App concept and 4.1 Curriculum and App design.

References

Barnett, Jacqueline M. (2002). Focus Groups Tips for Beginners. Retrieved from <http://www-tcall.tamu.edu/orp/orp1.htm>

Esteller-Curto, R., Escuder-Mollon, P., & Marin, P. (2012, July). The Virtuous Circle of Use, Attitude, Experience and Digital Inclusion. *eLearning Papers*, (29). Retrieved from <http://www.openeducationeuropa.eu/en/article/The-Virtuous-Circle-of-Use%2C-Attitude%2C-Experience-and-Digital-Inclusion>

Castells, M. (2006). *La sociedad red: una visión global*. Madrid: Alianza Editorial.

Chadwick-Dias, A., Tedesco, D., & Tullis, T. (2004). Older adults and web usability: is web experience the same as web expertise? In *CHI'04 extended abstracts on Human factors in computing systems* (pp. 1391–1394).

McCarthy, J., & Wright, P. (2004). *Technology as Experience*. The MIT Press.

Naumanen, M., & Tukiainen, M. (2009). Guided participation in ICT-education for seniors: Motivation and social support. In *39th IEEE Frontiers in Education Conference, 2009. FIE '09* (pp. 1–7). doi:10.1109/FIE.2009.5350544

Van Dijk, J., & Hacker, K. (2003). The Digital Divide as a Complex and Dynamic Phenomenon. *The Information Society*, 19(4), 315–326. doi:10.1080/01972240309487