

Summary Table 2: AT & ELDER PEOPLE

Research Papers

Author, year	Topic	Research design	Results	Conclusion	link
Hernandez-Encuentra E., Pousada M., Gomez-Zuniga B. (2009). ICT and older people: beyond usability <i>Educational Gerontology</i> 35; 226-245	ICT and older people: beyond usability	focus group interview of 7 independently living older adults(65-70) who had experience of using ICT+ online questionnaire to all university students of the same age group (13 of 85 responded)	*the need for ICT to adapt to users rather than the users adapt to technology. * ICT is a useful tool to maintain one's independence, but it may also increase dependence (slaves of technology) *high educational level facilitates the use of ict *it isa challenge for their generation to keep in touch with the world and to follow the development * the transition of use for other than recreational purposes was indicated(e.g.safety at home, health)	in addition to usability issues, attitudes, experience of use and perceived benefits are key aspects that must be taken into account when discussing adaptation to ICT. The elderly users need to know the function of the tool beforehand and to have continuous support. Moreover, thy need the certainty that the technology willa allaow them to mainatain independence and autonomy.	https://web.b.ebscohost.com/
Esteller-Curto R, Escuder-Mollon P (2012) . Non-practical ICT courses for seniors for a comprehensive involvement to provide a global understanding of the Knowledge Society . <i>Procedia-Social and Behavioural Sciences</i> 46: 2356-2361	Non-practical ICT courses for seniors for a comprehensive involvement to provide a global understanding of the Knowledge Society	6-lesson course for learners in senior university course entitled "The technology and information society" followed by a survey. 78 / 103 elderly students responded. A 5-point likert scale was used in the survey	The course was well received although it was mainly theoretical. All respondents used internet sometimes; 54% access internet daily and up to 85% at least once a week or more often. The learners recognized the importance of knowledge of ICT in order to remain included in today's society	The course should be complemented with other activities such as workshops and blogs. Senior users need to be aware of the possibilities that the net offers them and of how they can participate and have impact on the future of the Knowledge society as well as to be aware of the risks.	http://www.sciencedirect.com/science/article/pii/S1877042812016138

<p>Gonzalez A, Ramirez PM, Viadel V. (2012). Attitudes of the elderly toward <i>Educational Gerontology</i> 38;585-594.</p>	<p>Attitudes of the elderly toward information and communication technologies</p>	<p>21 – Question survey of 240 elderly persons registered in “Tele Services for the Elderly”-course. This course was designed as a 30 training hour program to learn and use digital platform with contents specifically planned for the elderly.</p> <p>The respondents were 55-91 years of age, mean 69.2 43,2% of the respondents were male, 56,8% female</p>	<p>Men were more involved in ICT training activities than women; the older adults from province towns more often believed that they will use the content of the course in their everyday life in comparison to people living in the capital area. Experience with computers correlated positively with usefulness of the course, behaviour to learn and correlated negatively with difficulty of the course.</p> <p>33% of the respondents participated to the course to maintain active mind; 67% to learn new tech. and to adapt to modern times.</p> <p>The barriers for not using what they learned during the course were linked to not having a computer at home, to lack of capacity or knowledge or to lack of time.</p>	<p>The participants’ involvement in the activities was related to greater contact with ICT which in turn generated more positive attitude towards its learning and utility as well as more self-confidence.</p> <p>The results show a great interest among the elderly in various activities that allow them to be active and healthy as basic prerequisites to successfully learn and use an course of ICT.</p> <p>The elderly seem to relate their education processes with their desire to participate in society and with a new way of representing themselves as persons.</p>	<p>http://www.tandfonline.com/doi/abs/10.1080/03601277.2011.595314</p>
<p>Agree E & Freedman V. (2011). A Quality-of-Life Scale for Assistive Technology: Results of a Pilot Study of Aging and Technology physical Therapy 91:1780-1788</p>	<p>A Quality-of-Life Scale for Assistive Technology: Results of a Pilot Study of Aging and Technology</p>	<p>Cross- sectional survey (N=360)</p> <p>age group 50+, living independently or in assisted living facilities, using some assistive devices</p>	<p>most commonly used assistive devices were mobility devices and sensory aids. The average number of devices in use was 3,8 items. About 58% of respondents used 1-3 devices. About 17% needed also personal assistance in addition to devices; mostly for transferring and leaving one’s home.</p> <p>A valid and reliable AT- QoL – scale can be created from 3 questions:</p>	<p>Determining the broader impact of assistive technology on quality of life with population level measures may provide insight into how best to leverage technologies to prevent dependence on others in aging adults</p>	<p>http://ptjournal.apta.org/content/suppl/2011/11/18/91.12.DC2/December_2011.pdf</p>

			<p>1)role of assistive tech. in increasing safety 2)control over daily activities 3)participation in enjoyable activities</p>		
<p>Mann W, Belchior P, Tomita M & Kemp B. (2005). Computer use by middle aged and older adults with disabilities. <i>Technology and Disability</i> 17:1-9</p>	<p>Computer use by middle aged and older adults with disabilities</p>	<p>Survey of 668 middle aged (mean age 51.6) or older persons (mean age 77.4) with disabilities to understand how they use computer or why not and their thoughts about accessibility</p>	<p>In the middle aged persons' group 17% had no internet access in their computer, in comparison to 6% in the older group.</p> <p>Most participants used computer at home and the main purposes were gathering information (51%/ 74%) and social contact (73%/ 70%), other important issues were writing documents or keeping records and finances.</p> <p>57% in the younger group and 53% in the older group were satisfied with their computer.</p> <p>Majority of the respondents were self-taught in computer use. Family members were accounted as trainers by 16.7% in the younger age group and 33.1% in the older age group. Community centre training or other courses were utilized by 11 % of the older users.</p> <p>Reasons for not using computer were linked to costs of the devices, lack of knowledge, lack of available training or to the feeling of computers being too complicated to use. Pain and visual impairment also rated high</p>	<p>The need for assessment and advice on the workstation and computer setup seems evident from the large number of those reporting discomfort and problems when using computer. Non-Users show interest in using computer but feel that the costs, lack of knowledge and lack of perceived need are the major reasons for not using computers. Few respondents felt that their impairment is a barrier as such in regard to computer use.</p>	<p>http://content.iospress.com/articles/technology-and-disability/tad00171</p>

			<p>in non-use.</p> <p>Most users had no adaptations in their computer work station although almost half of them experienced discomfort, especially when working for extended periods of time.</p> <p>Suggestions to improve accessibility of computers comprised wider screens, bigger keys of the keyboard, easy- to-use functions and voice activation.</p>		
<p>Greenhalgh T, Wherton J, Sugarhood P, Hinder S, Procter R & Stones R. (2013). What matters to older people with assisted living needs? A phenomenological analysis of the use and non-use of telehealth and telecare. <i>Social Science and Medicine</i> 93:86-94</p>	<p>What matters to older people with assisted living needs? A phenomenological analysis of the use and non-use of telehealth and telecare</p>	<p>Ethnographic study of 40 people aged 60-98, who were visited at home several times in 2011-2013</p>	<p>Not a single participant depicted assistive technologies as ready-to-hand (device matching the capability). Rather, there were major challenges in keeping the AT devices in active use.</p> <p>Many technologies served the health care / social service providers but did not improve the lived experience of impairment</p> <p>At the time when the device needs to be used the individual's physical and cognitive capacity has to align with its material properties and functionality. (time line between implementation and actual use)</p>	<p>Participants managed their health conditions subjectively and experientially, adapting technologies so as to enhance their capacity to sense and act on their world. this became more complex and challenging as the older person's physical and social world steadily shrank. If living is defined as doing what matters to one, the formal range of 'assistive living technologies' did not assist the participants to live with illness.</p> <p>Assistive technologies are components of collaborative networks, tying together patients, family and informal carers, health service providers. Bricolage must therefore be understood and</p>	<p>http://www.ncbi.nlm.nih.gov/pubmed/23906125</p>

			<p>Some viewed e.g pendant alarm as potentially exposing them to sinister intrusion or surveillance by strangers, or threatening to one's integrity or autonomy.</p> <p>Successful technology arrangements were characterized by bricolage -- a pragmatic customisation of the devices; understanding the needs and wishes and combining these to available and affordable technologies.</p>	<p>supported as a collaborative activity. Technology providers need to meet this challenge and revise assistive technology design policy radically.</p>	
<p>Bradley N & Poppen W. (2003). Assistive technology, computers and Internet may decrease sense of isolation for homebound elderly and disabled persons. <i>Technology and disability 15: 10-25</i></p>	<p>Assistive technology, computers and Internet may decrease sense of isolation for homebound elderly and disabled persons</p>	<p>Evaluation study (follow-up) of CHIP project (Computers for Homebound and Isolated Persons)</p> <p>20 participants with a wide range of disabilities that prevented them from being active outside their home environment were approached.</p> <p>The questionnaire consisted 10 statements that to be answered on a 5 point scale. The questionnaire was completed first in the beginning of the project when that participant got the computer and second time after appr. on year use</p>	<p>As expected there were no changes in mobility, or in need for assistance in daily living, but willingness to leave the house more often seemed to increase. Communication with family and friend increased significantly. Similarly significantly better communication with community service and governmental agencies was reported.</p> <p>The respondents seemed to be satisfied with their level of competence in using computer; however some had continued to develop their skills.</p>	<p>The results seem to verify that the participants utilized their computer skill to communicate more with others and that they are satisfied with the amount of social contact they have.</p> <p>The researchers conclude that sense of isolation may decrease significantly when learning to use computer and internet.</p>	<p>http://content.iospress.com/articles/technology-and-disability/tad00113</p>

<p>Lancioni G, Singh N, O'Reilly M, Zonno N, Cassano G De Vanna F, De Bari AL, Pinto K & Minervini M (2010). Persons with Alzheimer's disease perform daily activities using verbal-instruction technology: A maintenance assessment <i>Developmental Neurorehabilitation</i> 13; 2: 103-113</p>	<p>Persons with Alzheimer's disease perform daily activities using verbal-instruction technology: A maintenance assessment</p>	<p>Activity trials of nine persons with Alzheimer's. (two try-outs were interrupted)</p> <p>Performing different activities guided by recorded instructions (table setting, coffee, tea or snack preparation, make-up / shaving) were assessed during a 6- 14 month period.</p> <p>The timing of the instructions was controlled by specifically developed software and included a radiofrequency receiver that responded to photocell inputs and a programmable command function that regulated MP3 player. Modifications of the instructions were also studied.</p> <p>Number of correct responses, incorrect responses and modifications used were recorded, and the behaviour of the participants was observed.</p>	<p>Modifications of the instructions were critical to avoid ensure high level of correct response, avoiding frustrating failures and promote personal dignity.</p> <p>Most patients showed mood improvement during the try-out</p> <p>Prolonging the participant's positive engagement in various daily activities may be critical not only for their overall dignity and social mage but also for their mood.</p>	<p>Verbal instruction technology might be considered highly useful to help persons with mild or moderate Alzheimer's disease recapture and maintain daily activities and improve their mood.</p> <p>Further research is needed e.g. in regard to combining verbal and visual instructions.</p>	<p>http://www.ncbi.nlm.nih.gov/pubmed/20222771</p>
<p>Cahill S, Begley E, Faulkner JP & Hagen I. (2007). "It gives me a sense of</p>	<p>"It gives me a sense of independence" – Findings from Ireland on the use</p>	<p>Exploratory descriptive design: a mixed method – approach where both qualitative and quantitative</p>	<p>Products trialed: 1. Automatic night and day calendar 2. Lost item locator</p>	<p>The main result was: the simpler the better.</p> <p>The devices that were simple</p>	<p>http://www.tara.tcd.ie/handle/2262/49836</p>

<p>independence” – Findings from Ireland on the use and usefulness of assistive technology for people with dementia. <i>Technology and Disability 19:133-147</i></p>	<p>and usefulness of assistive technology for people with dementia</p>	<p>data was collected (ENABLE- project) (N= 34, two withdrew in the beginning and another 12 before the end of follow-up > N=20)</p> <p>7 men (mean age 72) 13 women (mean age 74) 17 with Alzheimer’s and 3 with other type of dementia MMSE mean 22 (12-29)</p>	<p>3. Automatic night lamp 4. Gas cooker device 5. Picture button telephone</p> <p>Night and day calendar was used and found useful by both the people with dementia and their caregivers</p> <p>Picture button telephone was used also 3 months after installation</p> <p>automatic night lamp users had difficulties with the technology and it was not used too eagerly</p> <p>lost item indicator performed poorly; complexity of the user interface for the demented people.</p> <p>gas cooker monitor was the least beneficial and/ or usable for the target group due to technical problems</p>	<p>were used more often and even after several months. Technical problems comprised unreliability or complexity of the devices. When perceived unreliable the devices were not used any longer.</p> <p>The familiarity of the design was helpful to the users. Unfamiliar products in turn, require new learning which may be a challenge for people with cognitive impairment. Caregivers support was necessary in reminding of the use of the device in many cases. In the context where people with more advantaged dementia live alone, they may be somewhat disadvantaged since they have nobody to prompt or assist them with new device.</p>	
<p>Blaschke C, Freddolino P, Mullen E. (2009). Ageing and technology: A review of the research literature</p>	<p>Ageing and technology: A review of the research literature</p>	<p>Literature review to identify what is known about the utility and effectiveness of current AT and ICT technologies. Furthermore to discuss ethical concerns and the</p>	<p>Impact on care-givers The studies indicate that the perceptions of the care givers themselves are very positive toward ICT interventions: they provide mechanisms to increased information and support and thus</p>	<p>Due to the small number of studies and limitations in the research designs, more research is needed in this area.</p>	<p>http://bjsw.oxfordjournals.org/content/39/4/641.abstract</p>

<p>.British Journal of Social Work 39:641-656</p>		<p>role of ICT-AT in social work practice and education Empirical studies focusing on interventions were included Categories: Behavior monitoring tools Smart home tools telehealth tools</p>	<p>relieve the burden of the care-givers.</p> <p>Impact on older adult users: the results of the reviewed studies are suggestive but not conclusive. Results from 3 RCTs provided mixed results. In twostudies the use of computer had no relationship with either depression or self-esteem scores, while in another reported a trend toward reduced loneliness and depression. No negative results of the interventions were reported and therefore there is little evidence of the true costs (money, time etc) of the interventions</p>		
<p>Broekens J, Heerink M, Rosendal H. (2009). Assistive social robots in elderly care: a review. <i>Gerontechnology</i> 8;2: 94-103</p>	<p>Assistive social robots in elderly care: a review</p>	<p>Existing literature on the effects of assistive social robots in health care for the elderly were systematically reviewed and analyzed ; MEDLINE, CINAHL, PsycINFO, The Cochrane Library databases, IEEE, ACM libraries and finally Google Scholar</p> <p>> 68 studies filled the inclusion criteria and 43 were analyzed</p>	<p>Studies focused on (i) increased health by decreased level of stress, (ii) more positive mood, (iii) decreased loneliness, (iv) Increased communication activity with others, and (v) rethinking the past. Most studies report positive effects.</p> <p>Companion robots are reported to increase positive mood, typically measured using evaluation of facial expressions of elderly people as well as questionnaires. Further, elderly people are reported to become less lonely with the intervention</p>	<p>There is some qualitative evidence as well as limited quantitative evidence of the positive effects of assistive social robots with respect to the elderly. The research designs, however, are not robust enough to establish this.</p> <p>In summary, large-scale experiments that are rigorously set up and an adequate methodology by which these studies are done and compared to each other are needed. Further, more variation in the form and function of these robots to figure out what parts actually contribute to the beneficial</p>	<p>http://gerontechnology.info/index.php/journal/article/view/gt.2009.08.02.002.00</p>

			<p>of companion robots as measured with loneliness measurement scales. With regards to health status, companion robots are reported to alleviate stress</p> <p>LIMITATIONS of the studies Majority of studies are with the Aibo and Paro companion robots. This means that little has been published on experimentation with different forms of assistive social robots. Most studies are done in Japan. Practically all of the studies are done with elderly people in nursery homes, not with elderly people still living in their own house. The research methods used to derive effects are not robust from a methodological point of view. Good control conditions are rare.</p>	effects is needed.	
<p>Boström M, Kjellström S & Björklund A.(2013). Older persons have ambivalent feelings about the use of monitoring technologies. <i>Technology and Disability 25: 117-125</i></p>	<p>Older persons have ambivalent feelings about the use of monitoring technologies</p>	<p>Qualitative study: five focus group interviews. Inclusion criteria age 65+, residing in senior housing and experience of security alarm</p> <p>45 older persons aged 67-97 participated, 6-13 persons in each focus group.</p>	<p><u>independence vs security</u> The participants were enthusiastic about feeling free and independent, but at the same time they wanted security even if it meant being watched over.</p> <p>Participants expressed feeling vulnerable and dependent on others because of their old age. They also claimed that new technology could seem frightening and difficult to accept at first, but over time they could get used to it and then it became more acceptable.</p>	<p>Often, technology is introduced to the old person at a sensitive time during or after an expressed need, for example fall injuries or feelings of insecurity .</p> <p>The technology should be seen from a promoting point of view, aiming to promote freedom, security and independency and introduced to older persons in an early stage. Only when the technology is individualized to each person's condition, it might not stigmatize and could be used as a</p>	<p>http://content.iospress.com/articles/technology-and-disability/tad00376</p>

			<p><u>Privacy vs intrusion</u> Older persons seem to distinguish between having their actions watched vs. monitoring their vital signs. Being seen as a person performing undesirable or unexpected acts or as someone with bad manners from others' points of view was considered even worse than having one's health status monitored.</p> <p><u>In the best interest of me vs best interest of others</u> The participants noted that as long as they were healthy, they were also capable of deciding whether they would use the surveillance system or not. However, there seemed to be ambivalence about the use of monitoring technology for one's own needs vs. use of a surveillance system to pacify others or for the convenience of others. Being linked to surveillance systems evoked a feeling of fear as the use of sensors data could imply being analysed as numbers /statistics rather than as a person with individual needs .</p> <p>The ambivalence was again expressed in that the technology might satisfy others' desire to control the older persons' lives rather than satisfying or helping</p>	<p>mean of true freedom.</p>	
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			themselves.		
<p>Chan M, Campo E, Esteve D & Fourniolos J-Y. (2009). Smart homes- Current features and future perspectives. <i>Maturitas</i> 64:90-97</p>	<p>Smart homes- Current features and future perspectives</p>	<p>A review: peer reviewed articles 1994-2009: (PubMed, IEEE Xplore, Google) Key words: smart home, telehomecare, e-health, telehealth, telemonitoring, telemedicine, assistive technology, wearable device, implantable device, cost, user satisfaction, ethics laws, socio-economic impact, intrusiveness Article does not provide information about the number, quality or type of articles included in the review</p>	<p>The review describes a selection of projects in developed countries on smart homes. Various technologies, advantages, disadvantages, impact on modern society as well as future perspectives are discussed</p> <p><u>Smart homes: advantages:</u> patients become more ‘informed’, ‘experts’, ‘educated self-managers’ and ‘have responsibility’. The telecare systems may save costs and time by reducing hospital admissions and practitioner visits. More up-to-date information available for the carers and medical staff.</p> <p><u>disadvantages</u> Lack of studies related to users’ need is the major barrier in implementation of smart home technologies. (the industry sells anything but the client does not know what she/he is buying)</p> <p>Significant barriers in social ethical and legal issues impede widespread adoption of these technologies A second barrier appears with the time and effort spent on learning how to use these tools</p> <ul style="list-style-type: none"> • privacy issues and patients autonomy are central 	<p>Methodological weakness of the studies (small samples, specific context or technology, study design) limit the generalization of the findings; the majority of the studies are trials with no control group.</p> <p>The needs of the users require more research. The devices and systems must be non-obtrusive and acceptable to users. Privacy and confidentiality must be maintained. Moreover, legal and ethical issues must be established to improve acceptability before the technology becomes widely promoted.</p>	<p>http://www.ncbi.nlm.nih.gov/pubmed/19729255</p>

			<ul style="list-style-type: none"> • fear of negative impact on human contacts limits the use of technology in elderly population • informal caregivers may fear that greater burden is placed on them • informed consent is required in some countries but may be difficult to get if the patient is suffering from cognitive decline and next of kin does not have legal power. Legislation varies in different countries. A full legal framework of telemedicine is lacking in the EU <p><u>Future perspectives</u> ; few projects aiming at future solutions are introduced; including a Swedish BoBra – concept where health care services, safety services and daily life services are combined with appropriate technology in a Smart Home (only one technological system for the user but many services included)</p>		
Harrefors, Axelsson& Sävenstedt. (2010). Using assistive	Using assistive technology services at different levels of care: healthy older	Twelve healthy couples aged 70+ (SWE) Participated	Positive perceptions were connected to the opportunity to have additional ways to communicate with nursing staff	According to the respondents whether AT is an asset or threat depends on caring need and level of dependence	http://www.ncbi.nlm.nih.gov/pubmed/20497268

<p>technology services at different levels of care: healthy older couple's perceptions. <i>Journal of Advanced Nursing 66;7: 1523-1532</i></p>	<p>couple's perceptions</p>	<p>Data were collected through individual semistructured interviews supported with written vignettes</p>	<p>and with friends as well as to the possibility of staying at home for longer time Another positive aspect was the possibility of becoming more secure at home through regular health monitoring.</p> <p>Many participants said that they felt safer with technical devices at home compare to being placed in a nursing home.; possibility to get quickly in touch with medical staff was appreciated.</p> <p>However the older couples became more resistant when considering a situation of dependence:".. these things are not always introduced voluntarily... you have to accept..."</p> <p>The couples saw the technology as an important help for the staff they were concerned what the increase in AT would mean to their relationship with spouse; will it overload him/ her with the demands</p> <p>Learning to use the devices later may be difficult; you have to learn before you become unhealthy. Lack of knowledge causes fear and resistance, especially fear of losing human contact.</p> <p>Dependence on care, living alone</p>	<p>Trust and security in the care of older people who are severely ill, dependent on care and living at home should be a hallmark in using assistive technology services. human presence is an important dimension and must be considered when developing concepts for use of AT services</p>	
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<p>Hamilton M. (2011). "I'm fascinated but I don't have the confidence". Adults Learning feb/2011: 28-31</p>	<p>"I'm fascinated but I don't have the confidence"</p>	<p>Qualitative study of with 21 older adults aged 58-90+ .</p> <p>The changing experience of communication technologies were explored through group discussions, interviews and photos.</p>	<p>Reported use of technology ranged from someone who does not use a mobile phone, word processor or email at all, to fairly well-advanced users of Facebook, sat navs and a variety of messaging technology.</p> <p>Many were prompted by the demands of organizing everyday life, including banking, dealing with official agencies to obtain benefits and pensions or for legal matters, for running businesses as well as for buying goods and services.</p> <p>Special leisure interests prompted a great deal of activity, including music, art, photography, gambling on the stock market, cooking, gardening and following sports.</p> <p>Keeping in touch was a strong motivation for the use of ICTs, whether this was with family and friends or for making new contacts.</p> <p>The participants also valued new</p>	<p>In short: chance, crisis, fashion, time and money to invest in learning and shopping, and suitable situations for using particular devices - all play their role in decision-making and may contribute to making change more or less likely at a particular point in time.</p> <p>Social relationships are central to this dynamic, especially the role of 'sponsors' of change. The ability to maintain control over the means of communications is crucial.</p>	<p>http://eric.ed.gov/?id=EJ942859</p>

			<p>technologies for improving safety on journeys or if living alone. However, several people emphasized the need to keep in touch in a 'humanly real' way – that is : to feel that you are communicating with a human and not a machine.</p> <p>For many in this group, the workplace was where they had first encountered computer technologies, learning on the job or being sent on courses. However, much learning was informal, prompted and encouraged by children and supported by family and friends.</p> <p>Some people mentioned changes in their capacity for learning and remembering with age. They found it difficult to master new technologies even when they could see the usefulness of doing so and even when help was at hand.</p> <p>Learning was perceived as particularly difficult when based only on sporadic use (for example, a mobile phone used only on infrequent long journeys) or when it was prompted by a crisis, in which cases it was hard to deal with all the technical details in a state of high emotion</p> <p>People were positive about the</p>		
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			<p>impact of ICTs on their lives, but they could see drawbacks as well. They highlight important issues of fear and trust, especially where online handling of money is involved. Unreliability and difficulties in obtaining technical support were mentioned as major factors affecting confidence in the use of ICTs.</p>		
<p>Peek S, Wouters E, van Hoof J, Luijkx, K, Boeije H & Vrihoef H. (2014). Factors influencing acceptance of technology for aging in place: a systematic review. <i>International Journal of Medical Informatics</i> 83: 235-248</p>	<p>Factors influencing acceptance of technology for aging in place: a systematic review</p>	<p>To provide an overview of factors influencing the acceptance of technology that supports aging in place by community-dwelling older adults. Inclusion criteria:</p> <ul style="list-style-type: none"> • original peer reviewed research • qualitative, quantitative or mixed method research • participants are community-dwelling older adults 60+ • the study aims at investigating the factors that influence the use of technology <p>Altogether 150 search terms were used in seven databases. 16 of 2841 articles were included</p>	<p>The qualitative results show that acceptance of technology in the pre-implementation stage is influenced by 27 factors, divided into six themes:</p> <ul style="list-style-type: none"> • concerns regarding technology • expected benefits • need for technology • alternatives for technology • social influence • characteristics of older adults <p>In the pos-implementation stage in addition to these some new aspects arise:</p> <ul style="list-style-type: none"> • concerns turn into real life • reliability of the devices • availability of home care as an alternative • level of satisfaction with the technology • <p>In the quantitative studies it was noticed that concerns regarding using a device has a significant negative influence on the</p>	<p>An older adult may have a number of specific technology-related concerns while the perceived benefits might be more abstract. It is necessary to introduce to possibilities and communicate the benefits early enough to reduce undue concerns. When an older adult does not see a need for technology, it is highly unlikely that she or he will be inclined to start using it.</p> <p>Results regarding factors that influence in the post-implementation stage are limited by the small number of studies. Longitudinal designs are needed in the future</p>	<p>http://www.ncbi.nlm.nih.gov/pubmed/24529817</p>

			acceptance. The perceived usefulness in turn, influences acceptance positively. Age seems to negatively influence acceptance of vital sign monitoring system but not the motion monitoring system. The number of safety and security concerns had positive impact on acceptance of technology.		
<p>van Hoof J, Kort H, Rutten P, Duijnste M. (2011). Ageing-in place with the use of ambient intelligence technology: perspectives of the older users <i>.International Journal of Medical Informatics 80: 310-330</i></p>	<p>Ageing-in place with the use of ambient intelligence technology: perspectives of the older users</p>	<p>The aim was to investigate the needs and motives related to ageing-in-place of the respondents receiving ambient intelligence technologies and to investigate how these technologies contributed to aspects of ageing-in-place.</p> <p>Data was collected through two rounds of interviews of community-dwelling older adults with a complex demand for care. However only 12 of the original 18 respondents participated to the second interview. (six passed away or were institutionalized during the study period)</p>	<p>the strongest motivation to use technology was the aversion against institutionalisation. Safety and security were important factors. The new technology contributed to an increased sense of safety and security among the respondents.</p> <p>The usefulness of the devices was critical from two perspectives: operational and design. Better support was required and also health professionals should be able to respond to basic questions. Installation of the devices should be done in an acceptable unobtrusive manner; sense of private home must not be violated.</p>	<p>Stand-alone ambient intelligence technologies do not provide an all-embracing solution for people who wish to age-in-place. rather, they can only function within the context of other solutions and services. In general, the participants were not worried about privacy issues; safety was seen as a higher priority.</p>	<p>http://www.ncbi.nlm.nih.gov/pubmed/21439898</p>
<p>Wilson D., Mitchell J, Kemp B, Adkins R, Mann W. (2009). Effects of Assistive Technology</p>	<p>Effects of Assistive Technology on Functional Decline in People Aging With a Disability</p>	<p>This study used a randomized control group design to investigate the impact of an assistive technology and home modification intervention</p>	<p>both groups had functional decline over time during the 2-year period as indicated by a significant time finding for the FIM and IADLs. The treatment group's functional</p>	<p>Clinicians need to be aware that regardless of an individual's impairment, functional decline will occur earlier for individuals aging with a disability than for those</p>	<p>http://www.ncbi.nlm.nih.gov/pubmed/20066887</p>

<p>on Functional Decline in People Aging With a Disability .<i>Assistive Technology, 21:208–217.</i></p>		<p>on function for individuals who are aging with a disability. 91 participants (68 women, 23 men, mean age 62 SD 14) with polio, rheumatoid arthritis, cerebral palsy, spinal cord injury, stroke, and other impairments.</p> <p>Outcome data were collected at 12 and 24 months through in-home interviews. (including FIM and evaluation of IADL)</p> <p>The treatment group received an in-home evaluation of their equipment and home modification needs. All recommended AT and home modifications were provided and paid for in full or in part by the study. The control group received the standard community-available health care.</p>	<p>decline was slower than that of the control group (FIM score)</p> <p>In the follow-up the treatment group had significantly more desired functional changes than the control group. The desired change was the ability to gain or maintain independence with the given task through use of equipment only, thereby reducing the need for personal assistance.</p> <p>Over half (56.8%) of the equipment provided or acquired by the treatment group was related to safety in the bathroom or safely getting around the home.</p>	<p>experiencing normal age-related changes who do not have a disability. This will allow the clinician to make recommendations for AT, including environmental adaptation and behavioral strategies, earlier in the aging process to slow functional decline and support aging in-place.</p>	
<p>Trentin G. (2009). E-learning and the third age .<i>Journal of Computer Assisted Learning. 20:21-30</i></p>	<p>E-learning and the third age</p>	<p>The education goals were pursued through the provision of 42 simultaneous editions of the training course, each made up of 13–15 people for a total of about 600 participants. Intervention:</p>	<p>About 26% of the participants completed all the exercises correctly, 32% completed three-quarters correctly. About 70% correctly completed the exercises considered essential to certification of having achieved the training goals of the online course.</p>	<p>Compared to younger people, the elderly, especially in the initial stages of a technology-supported course, show a greater need for direct personal interaction for a variety of reasons, such as unfamiliarity and uncertainty with technology tools.</p>	<p>http://www.researchgate.net/profile/Guglielmo_Trentin/publication/227675876_Elearning_and_the_third_age/links/0912f511a860eec724000000.pdf</p>

		<ul style="list-style-type: none"> theoretical and practical training lasting 80 h, 2-3 weekly meetings of 2 h each run by an ICT teacher backed up by a classroom tutor; distance activities, lasting about 24–30 h, to be carried out in one’s own home <p>The aim of the paper is to explore:</p> <ul style="list-style-type: none"> the achievement of the declared training goals; the level of participation and involvement of the individual participants in online activities the participants’ general attitude/degree of satisfaction regarding the method adopted to run the online activities 	<p>Analysis of messages shows fairly high levels of participation in network activities. The messages sent in the e-groups were essentially of two types: interaction messages concerning the task and social interaction messages. Communication in group 1 was centered around four people, while the other course participants sent or received only sporadic interpersonal messages. On the whole, however, communication was reasonably distributed throughout the entire group, also aided by the spontaneous triggering of self-help dynamics when exercises were being completed.</p> <p>In the initial stages almost all showed a feeling of disorientation and in some cases suspicion of communication via computer. The difficulties in socialisation were attributed by the participants to relating to people that they did not know and could not see physically. About two-thirds of the way through the e-learning course the attitude of most participants changed radically.</p> <p>78% of the participants stated</p>	<p>In e-learning courses, the response times (above all sensorial), motivations and needs of older people differ from those of younger participants, and for this reason many methods need to be rethought both in the design of materials for e-learning and in running online activities, especially group ones.</p> <p>For example, there are differences compared to younger people in the speed of moving the mouse, typing messages in the framework of synchronous and asynchronous interactions, browsing through screens, as well as a different ability to maintain concentration on individual segments of the training course.</p> <p>there is the need of specific training both for designers of e-learning for the third age, and for the online tutors who are asked to organise online learning communities for the over-60s</p>	
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Theoretical Papers

Author, year	Topic	Commentary/narration/ review	Conclusion	Link
<p>Magnusson & Hansson. (2012). Partnership working: the key to the AT- technology transfer process of the ACTION service (Assisting Carers using Telematics Interventions to meet Older people's Needs) in Sweden</p>	<p>Partnership working: the key to the AT- technology transfer process of the ACTION service (Assisting Carers using Telematics Interventions to meet Older people's Needs) in Sweden</p>	<p>Main lessons learned: user- centred approach was a critical success factor</p> <p>innovative appeal and flexibility of the service</p> <ul style="list-style-type: none"> ➤ acceptability <p>research based educational programmes for the users</p> <p>ongoing support by the key stakeholders</p> <p>commercialisation of the service</p> <ul style="list-style-type: none"> ➤ to reach a wider base of users <p>Challenges: organisational complexity</p> <p>negative attitudes of professionals regarding technology within social and health care</p> <p>support from all stakeholders</p> <ul style="list-style-type: none"> ➤ need for constant awareness raising and education of the staff and management as well as political decision makers <p>evidence</p> <ul style="list-style-type: none"> ➤ need for evaluation studies, especially on organisational level e.g cost – effectiveness of the service <p>mainstreaming</p> <ul style="list-style-type: none"> ➤ dependence on financing the service ➤ solid business plan to be created with the commercial company (Telia) <p>policy</p> <ul style="list-style-type: none"> ➤ on local, regional,national and EU level 	<p>the empowerment framework and user-centred design model lies at the centre of the ACTION service and they are seen as crucial elements in the future development of the service.</p>	<p>http://content.iospress.com/articles/technology-and-disability/tad00351</p>

<p>Molin G, Pettersson C, Jonsson O & Keijer U. (2007). Living at home with acquired cognitive impairment – Can assistive technology help?</p>	<p>Living at home with acquired cognitive impairment – Can assistive technology help?</p>	<p>The paper describes an ongoing project developing an innovative approach to the introduction of assistive technology to the homes of elderly people with cognitive impairment. The complicated distribution of responsibilities between different actors around the participant already a matter of principal concern in the beginning of the project. The authorities need to define measures to remove administrative and financial obstacles in order to be able to offer appropriate AT for the target population Another aspect was the dispersed knowledge of individual partners; all competent in their own field but there are large gaps between essential pieces of knowledge in caring professions housing operation and maintenance and the development of ICT. During the process the functioning of many participants deteriorated substantially and the drop out-rate was inevitably high.</p> <p>The project leader’s role and authority were unclear in the beginning but later she was given full authority in decision making which made things flow more smoothly.</p>		<p>http://content.iospress.com/articles/technology-and-disability/tad00231</p>
<p>Ballabio E& Whitehouse D. (1999). Ageing and disability in the informations society: a European perspective on research and technological development.</p>	<p>Ageing and disability in the informations society: a European perspective on research and technological development</p>	<p>the paper concentrates on EC ‘s commitment to improve thequality of life of older people in the information society so as to find wasy to empowering these groups “ assistive technology can be defined as technologies services or systems that prevent or compensate for functional limitations, facilitate independent living and can enable elderly and disabled people to realise their potential!</p> <p>The paper introduces the TIDE project (Telematics for the ontergration of disabled and elderly) buy describing its constituencies (demographic change, changing demands for social and health care services and market for AT). in</p>	<p>NOTE! from year 1999!</p> <p>the core value of this paper is in the definitions of AT etc.</p>	<p>http://cirrie.buffalo.edu/database/16633/</p>

		<p>addition some success stories are introduced shortly.</p>		
<p>Malanowski N, Özçivelek R & Cabrera M. (2008). Active ageing and Independent living services: the role of information and communication technology</p>	<p>Active ageing and Independent living services: the role of information and communication technology</p>	<p>This report highlights the main policies related to active ageing and the policy fields, health, work and retirement, where ICT-based services will be determinant. Active Ageing, i.e. the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age, comes up more and more often in European political discourse. Quality of life is largely determined by the ability of older citizens to maintain their autonomy and independence, hence the importance of products and services that support Independent Living Systems (ILS) and the potential of Information and Communication Technology (ICT) to enable them. ILS are enabling services designed to help people gain independence and to assist communities in eliminating barriers to independence. Active Ageing and ILS are integrative policy issues. They require input from different policy areas on both national and European levels: e.g. social policy, labour market regulation, health/care, housing, RTD, telecommunication and information society policy. A major challenge for the future will be developing ICT policies which are integrated into welfare, health and social inclusion policies and adapted to a changing society.</p> <p>Following challenges are to be overcome in the near future:</p> <ul style="list-style-type: none"> • One of the main challenges for policy makers has been on the one hand to deal with the dependency needs of the ageing population and on the other hand to promote and develop older people as vital resources of society. • A purely market-driven approach towards Active Ageing and ICT-supported ILS endangers equal access and affordability for all • Cost-benefit dynamics of some ICT-based 		<p>http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=1561</p>

		<p>ILS applications are often complex and not yet fully understood (e.g. in the case of the 'smart home' and in the field of telecare/ telemedicine). Virtually all currently available cost-benefit analyses of ILS rely upon small-scale evaluations, many of which have been conducted in experimental rather than in real-life settings</p> <ul style="list-style-type: none"> • There exists a persistent myth of ICTsupported ILS being developed only to achieve savings in costs and staff • ILS is developing in a complex field of different kinds of users, having particular roles and relationships. • ICT development in care and support settings is mainly focusing on professional and formal forms of provision of care • Mediterranean countries have a great number of informal networks which are of central importance when ageing threatens to cause dependency among older people. However, social policies in these countries rely heavily on the role played by the family and this is something changing rapidly as a result of the incorporation of women into the workforce and the marked and sustained decline in the birth rate (leading to a convergence with other European countries in the short term). • Awareness of Active Ageing and ILS and the opportunities they offer is limited among potential users, professional organisations and policy makers alike. • Active Ageing and ILS Research efforts are fragmented • Since current policy competencies on health and social issues are limited to the regional or national level, a major revision and model have to be developed on methods to combine the different 		
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		ideas and models of Active Ageing and Independent Living.		
<p>KÄKÄTE http://www.ikateknologia.fi/en/</p>	<p>Usable technology for users – project (KÄKÄTE) was implemented in Finland 2010-2014. During the 5 – year project many surveys and interviews among older adults aged 65+ were carried out. The results were presented and elaborated in a national seminar with about 150 participants in Helsinki on the 2nd of December 2014.</p>	<p>The 1st study was conducted among 75-85 year old people. The sample was a representation of Finnish the population of the age group in regard to gender, educational background, living environment etc. Based on the results of the phone interviews (N=800) it is estimated that over 300 000 elderly person living in Finland do not use internet; the older they are the less they use. However, most of the respondents believed that they could learn to use ICT with the help of proper guidance but everyone doesn't want to use it. About 90% had a cell phone, 1 in 3 had internet access and 1 in 4 had email address. More than 85% of those who did not have any of these technologies, thought that they did not need any of them. It was concluded that in order to be interested in technology one has to see the benefits and usefulness in everyday life.</p> <p>The 2nd study (N=1100) was about the older adults' interest in technology. Biggest interest was shown towards easy-to use computers, integrated safety systems and security phone with GPS device. In all of these, the wish was that they will be easy to use. The main limitation expressed by the respondents was that there were no places to try and test different technologies.</p> <p>In the 3rd study (N= 300) usability of different ticket automats etc. and ATMs were surveyed. The results showed that 36% in the age group 75-85, and 63% in age group 85+ respectively, had never used ATMs. The qualitative study among 11 users (real life testing, interviews, user panels) showed that difficulties were connected to physical characteristics of automats e.g. size, screen and key board. Social pressure such as rush hour, or long queues, had a clear negative impact on the performance of the users. Also the fears of making mistakes or to be robbed in public places were explicated as reasons for not using automats.</p>	<p>As a conclusion of all these studies, five wishes to technology creators were presented:</p> <p>Even though I am getting older...</p> <ol style="list-style-type: none"> 1. I want to experience the joy of success 2. My home is my castle – but the castle must not be my prison 3. I want to resolve my daily problems by myself 4. Human contact is a resource of power 5. Making the right choice is not getting easier – force-fed sweets are hard to swallow! 	

In the 4th study (N=264) the experiences of the care takers (spouses) were surveyed. The results indicated that they used very little assistive or communication technology in their daily life. The respondents pointed out that they did not have enough information of available devices, systems or solutions.

The 5th survey (N=123) concerning digital games showed that older adults felt that games can bring joy to daily life, activate memory functions and perhaps prevent decline in cognition. One problem was that there were few games available in Finnish. The second problem was that the themes of the games were not interesting for the older adults. Especially games with violence or war actions were perceived as not-interesting by the generation that has experienced the Second World War.

The 6th survey (N= 400) concerned 75-80 year-old persons living in their own homes. The respondents felt that the most important issues in their lives were accessible accommodation, possibility to spend time also outdoors (balcony, garden), experience of privacy and good services nearby. About 50 % of the respondents found public transportation, storage room for assistive devices (e.g. walking aids) and home security services as a plus. However, most of the respondents were willing to move to a more accessible flat or supported accommodation or if it was necessary in regard to safety.