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Active Ageing and the Potential of ICT for Learning

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Executive summary

Learning plays a key role in ageing societies as it can help to address many of the related challenges and opportunities, such as increasing social and health expenditures, older people's participation and contribution to the economy, re-skilling and up-skilling in the knowledge-based information society and inter-generational sharing of experience and knowledge. When dealing with learning in ageing societies, it is important to consider learning in the broad sense and not only look at formal learning institutions. Learning can take place in formal education (i.e. structured learning leading to certification) and non-formal settings (i.e. structured learning situations, but not necessarily leading to certification). Learning can also take place in informal settings (i.e. in everyday life, often unintentionally) by oneself and in interaction with other people. The non-formal and informal dimensions of learning come to the fore especially in ageing societies, while at the same tome ICT (Information and Communication Technologies) are playing an increasingly important role.

In scientific and policy discussions on active ageing, the notion of quality of life is receiving increased attention. Improving the quality of life of older people requires taking into account their work environment, their community and social relations, their home environment, and their personal well-being. They have different types of learning needs, related to improving knowledge or their ability to accomplish practical tasks. Learning can also be considered as an important activity in itself, improving personal fulfilment and social connections. However, there are personal barriers to the access to learning, and the skills, abilities and motivation needed. Older people are a heterogeneous segment of the population and, in order to develop flexible and relevant learning opportunities, it is necessary to take into account both the content and the conditions of learning in their specific contexts. Finally, it is not only important to involve older people in learning to improve their knowledge but also to provide the opportunity for others to learn from them.

ICT have an important role to play in developing learning opportunities for older people both as a topic in its own right and also as a means of learning in the knowledge society. ICT can provide more individualized learning, compensate for disabilities and provide new opportunities to access information and services. However, it may also bring new obstacles, depending on the tools and approaches used. Present ICT tools are often not user-friendly for older users, who may have physical limitations and low ICT skills. When developing ICT-enabled learning, special consideration should be given to older people with disabilities and with little experience of ICT interfaces. Difficulties in learning to use ICT tools may prevent learners from learning effectively with ICT-enabled approaches or even kill their motivation for pursuing learning, if ICT tools are involved.

Promoting lifelong and lifewide learning requires the development of a whole new vision for the role and organization of learning in the future, involving different groups of people and social networks, organizations, educational institutions and workplaces in new ways. There is a need to improve research and development on learning tools and approaches designed to meet the different needs of older people. Older people themselves should be involved in the development processes of tools and learning projects as users, experts and senior advisors.

Holistic policies are needed to support learning opportunities in ageing societies. These policies should be linked to the overall development of lifelong learning. Lifelong learning policies can maximise the readiness and ability of older individuals to learn, by supporting continuous learning throughout their lives. Particular attention should be paid in these policies

to older people as both learners and mentors. Learning opportunities for older people outside organized education should be promoted by informing people and by supporting local and ICT-enabled networking communities and meeting places that enable interaction and knowledge sharing between generations, both with and without ICT.

1 Introduction

Ageing and the information society

The world is experiencing an important demographic transformation: the unprecedented ageing of the populations of almost all developed and developing countries. The growing presence of older people[1] in society makes people of all ages more aware that they are living in a multi-generational society. Increasingly, ageing populations influence global patterns in labour and capital markets, services and traditional social support systems like healthcare and pensions in European countries. In all the Member States of the European Union (EU) current fertility rates are low.[2] If birth rates continue to decrease as predicted, the proportion of young and old citizens will undergo a historic crossover. Besides this, the baby-boomer generation (born between 1945 and 1965) with its large number of people has started to retire. A projection[3] of ageing in the EU27 for the period between 2008 and 2050 predicts that the population aged 65+ will increase by 64 million or 75% and that, at the same time, the working-age population will drop by 36 million or 11%. In the EU27, this may mean that there will be two people of working age for every older citizen, instead of four working people at the present time. However, though all EU Member States are expected to experience an ageing population, there will be some differences in timing, nature and scale (Economic Policy Committee/European Commission, 2005).

The EU is tackling the economic, employment and social implications of ageing as part of an "overall strategy of mutually reinforcing policies", launched at the Lisbon European Council in March 2000. This approach has been confirmed at subsequent European Council meetings in Nice, Stockholm, Gothenburg and Laeken as population ageing is observed in most EU Member States. The Social Policy Agenda, annexed to the Nice European Council conclusions, lists EU policy priorities in employment and social affairs, outlining how Member States can deal with the wider social and work-related implications of ageing through mutually reinforcing employment, social protection and economic policies. In this context, active ageing policies and practices which include, for instance, lifelong learning, working longer and retiring more gradually, being active after retirement, and engaging in health-sustaining activities are being encouraged (European Commission 2005c & 2006a).

The EU initiative "i2010 - A European information society for growth and employment" aims to promote an inclusive European information society and to make Europe more attractive to investment and innovation in knowledge-based goods and services (European Commission, 2005b). Linked with i2010 are flagship initiatives illustrating the potential of ICT to improve quality of life.[4] One of these is the initiative Ageing Well in the Information Society, addressing technologies for wellbeing, independent living, health and work-life balance. In

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1 In most Anglo-Saxon countries the term "older people" is used. The equivalent in other countries like France, Germany and Spain is "elderly people".

2 See: http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1996,39140985&_dad=portal&_schema=PORTAL&screen=detailref&language=en&product=Yearlies_new_population&root=Yearlies_new_population/C/C1/C12/cab12048

3 EUROPOP2008, available at Eurostat website, http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0,1136184,0_45572595&_dad=portal&_schema=PORTAL

4 http://ec.europa.eu/information_society/eeurope/i2010/flagship_initiatives/index_en.htm

addition, ways to overcome the geographic and social digital divide, culminating in a European initiative on e-Inclusion[5] have been suggested (European Commission, 2007a).

The 2007 European Commission Communication "Ageing Well in the Information Society"[6] supports EU policy in the areas of growth and competitiveness in the revised Lisbon agenda, demographic change, employment, health and equal opportunities. It presents an action plan that considers ICT for ageing well as both a social necessity and an economic opportunity: "The information society can enable older people – when and where they wish to do so – to participate fully in society and the economy, and to be active as empowered citizens; and at the same time generate benefits for businesses and for economy and society at large." (European Commission, 2007b). The action plan aims to enable better quality of life for older people with cost-savings in health and social care, and also to help in creating a strong industrial basis in Europe for ICT and ageing. It highlights work, community and home as areas where older have important needs to be considered and addressed.

The Declaration resulting from the Ministerial Conference "ICT for an inclusive society" held in Riga[7] in June 2006 (European Commission, 2006b) underlines the need to address "ICT solutions for active ageing". In line with the 2008 European initiative "e-Inclusion", it also stresses that "the contribution of civil society, industry and all other stakeholders is essential". The declaration suggests that special attention should be given to addressing the needs of older people by: "Exploiting the full potential of the internal market of ICT services and products for the older people", "Improving the employability, working conditions and work-life balance of older workers", "Enhancing active participation in the society and economy and self-expression", "Realising increased quality of life, autonomy and safety".

Role of learning in the ageing society

Learning plays a key role in ageing societies as it can help to address many of the challenges and opportunities of ageing societies such as increasing social and health expenditures, older people's participation in employment, and re-skilling and up-skilling in the knowledge-based information society. In an increasingly digitized society, where new digital applications and technologies are being developed constantly, learning is important throughout life. Learning is also changing and becoming less solitary work and more interactive and collaborative. Informal learning in workplaces for example is increasingly recognized as an important form of knowledge exchange. The need to enhance learning opportunities for older people relates to the overall development of the role of learning in the information society.

The terms 're-skilling' and 'up-skilling' can raise discussions, as they often are used to mean the same thing, but with different connotations. These terms do not imply that older workers are undereducated in general, but to the fact that there have been substantial changes in the nature of work. In the past two decades, a substantial proportion of all jobs have become more technical and varied. Much of this is due to the introduction of computers, which require many workers to take on tasks like word-processing or financial analysis which once would have been done by specialists. It is therefore necessary to explore mechanisms that provide the employees who completed their formal training a long time ago with the opportunity to

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5 See: http://ec.europa.eu/information_society/activities/einclusion/docs/i2010_initiative/comm_native_com_2007_0694_f_en_acte.pdf

6 http://eur-lex.europa.eu/LexUriServ/site/en/com/2007/com2007_0332en01.pdf

7 http://ec.europa.eu/information_society/events/ict_riga_2006/doc/declaration_riga.pdf

acquire new skills. Especially the oldest-worker groups are often in need of re-skilling so that they can continue working efficiently with the new tools.

The European Commission communication “Making a European Area of Lifelong Learning a Reality” identifies strategies and measures for fostering lifelong learning for all (European Commission, 2001). The communication recognizes that people learn in organized formal and non-formal education and also informally by themselves and in interaction with other people. Adult learning communications “Adult learning: It is never too late to learn” (European Commission, 2006c) and "Action Plan on Adult learning" (European Commission, 2007c) highlight the importance of an efficient adult education system in lifelong learning. All member states are encouraged to build an efficient adult learning system. Key messages include increasing equitable participation possibilities for adult learning, concentrating on the quality of learning approaches for adult learners, recognition of non-formal and informal learning, investments in the education of older people and migrants, and importance of data gathering on adult learning. The communications also bring up the importance of migrants and older workers in society and the economy, and the need to ensure efficiency of education and training by designing it to match the needs of the learner.

While learning can be seen as an answer to the problems of older people, the opportunities of inter-generational sharing of experiences and knowledge should also be considered. Increased life expectancy and improved health for older people can be seen as new assets that the society should learn to benefit from. Learning can enrich quality of life for older people, and also for the people interacting with, and learning from, them. Older people have a lot of valuable in-depth knowledge to give to younger workers and to each other, and new technologies can provide new means for enabling this. Intergenerational learning provides a context that can improve both learning the specific learning topics and the tacit knowledge and life experiences relating to them. In this way, the learning situation also enriches the general understanding between generations. In Europe an increasing number of people will be 60 or older. According to EUROPOP2008 forecast,[8] 23% of the EU27 population will be 60+ by 2010, and 35.2% by 2050. It will therefore be important to continue to access their knowledge and experience to work with them and to learn from them.

Structure of the report

This report is based both on desk research (Ala-Mutka & Punie, forthcoming) and on a workshop on "Active Ageing and ICT for Learning", Seville, 26-27 February 2007, organized by IPTS.[9] The objectives of the workshop were: (i) to discuss the key elements of the role of ICT for learning in an ageing society and their implications for Europe (ii) to identify and discuss current and future needs in the area of learning in the context of ageing societies, the role that ICT can play to address these and how to match the technological supply with these needs, and (iii) to define the key policy and research challenges and collaboration opportunities.

The structure of the report is as follows: Chapter 2 discusses the elements relating to quality of life and active ageing. Chapter 3 reviews aspects of lifelong learning and learning in the

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8 Available from Eurostat website, http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0,1136184,0_45572595&_dad=portal&_schema=PORTAL

9 IPTS (Institute for Prospective Technological Studies) is one of the 7 research institutes of the Joint Research Centre of the European Commission.

older age groups. Chapter 4 discusses how ICT relates to, and could support, learning in old age. Chapter 5 proposes research challenges and finally, Chapter 6 gives policy suggestions for enhancing ICT-enabled lifelong learning in an ageing society.

2 Active Ageing and Ageing Well

Active ageing

According to the World Health Organisation, active ageing is "the process of optimising opportunities for health, participation and security in order to enhance the quality of life as people age" (WHO 2002). 'Active' refers to a continuous participation in social, economic, cultural, spiritual and civic affairs, not just the ability to be physically active or part of the labour force. This applies to both individuals and groups. It allows people to realise their potential for physical, social, and mental well-being throughout their lives and to participate in society according to their needs, desires and capacities, while providing them with adequate protection, security, care and assistance when they need it. As illustrated in Figure 1, the determining factors of active ageing include:

- Cross-cutting factors of culture and gender
- Health and social system: health promotion and disease prevention; curative services; long-term care; mental health services
- Behavioural factors: healthy life styles, including e.g. tobacco and alcohol use, diet, physical activity, use of medications
- Personal factors: biology and genetics; psychological factors
- Physical environment: safe housing; prevention of falls; clean water and air; safe foods
- Social environment: social support; violence and abuse; education and literacy
- Economic factors: income; social protection; work (formal and informal sector)

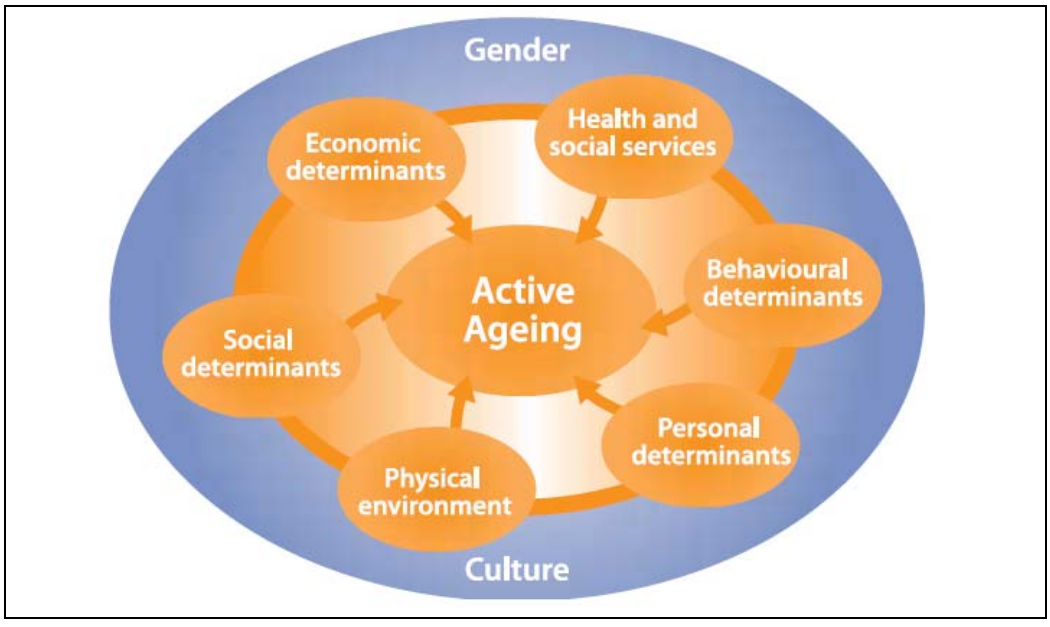

Figure 1 : Determinants of active ageing (WHO 2002)

Education is an important determinant of active ageing. Low levels of education and illiteracy are associated with increased risks of disability and death among people as they age, and higher rates of unemployment. The WHO suggests that education in early life combined with opportunities for lifelong learning can help people develop the skills and confidence they need

to adapt and stay independent, as they grow older. Intergenerational learning may provide many types of positive effects, as studies have shown that young people who learn with older people have more positive and realistic attitudes to the older generation (WHO, 2002).

Qualify of life

There is no common agreed definition or measurement of Quality of Life (Gilhooly et al, forthcoming). The WHO defines it as "an individual's perception of his or her position in life in the context of the culture and value system where they live, and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept of the complex relationship between a person's physical health, psychological state, level of independence, social relationships, personal beliefs and salient features in the environment." And as people age, their quality of life is largely determined by their ability to maintain autonomy and independence. This concept is so broad and vague that its separate aspects need to be differentiated in order to support the discussion.

As discussed by Gilhooly et al (forthcoming), simple, but useful predictors for the quality of life of individuals are:

- Wealth (working, getting money)
- Social relations (self-actualization, loneliness)
- Health (physical and cognitive)

These all affect how an individual perceives his own happiness and are related to different challenges in the ageing context. These also correspond to the areas of need pointed out in the Action Plan on Ageing Well in the Information Society (European Commission, 2007b):

- *Ageing well at work*, as staying active and productive for longer with better quality of work and work-life balance.
- *Ageing well in the community*, as staying socially active and creative, improving quality of life and reducing social isolation.
- *Ageing well at home*, as enjoying a healthier and higher quality of daily life for longer, assisted by technology, while maintaining a high degree of independence, autonomy and dignity.

These three areas are linked to different learning needs for older people as jobs, living environments, social networks, and their own health change in old age. Learning is necessary for improving knowledge (e.g. learning health related issues) and for improving capabilities for practical tasks (learning to use new tools, such as online banking or learning new activities). Learning is also a rewarding activity in itself, improving the individual's perception of well-being and also the individual's social relations when he interacts with, and learns from, others, be they young or old.

In the following chapter, these three aspects of learning (learning to know, learning to do, and learning as activity) are linked to the learning needs in work, personal well-being and social community in a discussion on the role of learning in ageing societies.

Diversity of older people

Gassmann & Reepmeyer (2006) and also other gerontologists like Binstock, Fishman & Johnson (2006) and Settersten (2006) argue that a new paradigm of ageing should be

considered. This paradigm emphasises "the complexity of ageism" and the importance of taking into account the different characteristics of "the elderly". Older people are a heterogeneous group and improved differentiation is necessary. The traditional categories for age groups (categories like 50-64, 65-74 and 75+) are useful for statistics and quantitative research on older people. However, the above mentioned authors argue for a different approach, based not on age but on the following phases of ageing:

1. Age more or less close to retirement (period of pre-retirement)
2. Autonomous age as a pensioner (period of independent living)
3. Age with increasing handicaps (start of period of dependent living)
4. Dependent pensioners' age (period of dependent living up to the end of life)

In addition to the different phases of working/retiring and living independently/dependently, many other issues affect the needs of older people and their perceived quality of life. For example, financial aspects, living environment, social ties and personal interests can differentiate older people considerably. The needs of a wealthy person living alone and planning for his next holiday are very different from an older couple struggling with their health and paying their electricity bills. Isolated individuals have different factors and interests in their lives than people with continuous interaction with family or friends. These issues also strongly affect the learning and ICT-related needs and interests of these (older) people. For successful research and development work, recognizing the need for differentiation is important.

The *life course perspective* on ageing also recognizes that older people are not one homogeneous group, as individual diversity often increases with age (WHO, 2002). The life course perspective "reflects the complexity and reflexive character of choices and constraints throughout the whole life course" (Malanowski et al, 2006, p. 7). Using this perspective could help to develop better research tools for predicting the future needs of those who are not yet old. This perspective assumes that an individual's path to old age is not predetermined. Instead, it reflects lifestyle practices during the individual's life. The lifestyle is the way a person (or a group) lives and includes patterns of social relations, consumption and entertainment. When considering learning, it is especially important to build and maintain learning capacities continuously, including how to use the necessary ICT tools, to enable learning throughout life. One of the main challenges of the present older generation is that the learning tools, methods and resources have changed tremendously since their most active learning phase and these older people would need extra effort to plug in to learning again.

3 Learning and Ageing

Lifewide learning

Education is often seen as an important tool to increase the participation and quality of life of older people. In addition, the social context is important for both activating older people and providing young people with the possibility to learn from the life experiences of older people in inter-generational interaction. Increasing choice and diversity in adult education can widen the participation of adults in education and training, improving the inclusion of older peoples' groups that have not traditionally engaged (OECD, 2006). The European Commission communication on universities in 2006 specifically invites universities to be more open to providing courses for students at later stages of their life cycle (European Commission, 2006d). Also the teachers support this, as in the 2007 Eurobarometer survey, 87% of teaching professionals in EU27 agreed that universities should open up for adult learners.[10]

However, organized courses are only one form of learning opportunities. Lifelong learning is defined as "all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social and/or employment-related perspective" (European Commission, 2001). It encompasses the whole spectrum of formal, non-formal and informal learning, not only school and university education. The term 'lifewide learning' is often used to illustrate the versatility of learning situations in all aspects of life. Different types of learning are typically categorized as formal, non-formal and informal learning:[11]

- Formal learning is typically provided by an education or training institution, structured (in terms of learning objectives, learning time or learning support) and leads to certification. Formal learning is intentional from the learner's perspective.
- Non-formal learning is provided by any organized, structured and sustained educational activity. It may take place both inside and outside educational institutions and caters for people of all ages. Non-formal learning is intentional from the learner's perspective, but typically does not lead to certification.
- Informal learning results from daily life activities related to work, family or leisure. It is not structured (in terms of learning objectives, learning time or learning support) and typically does not lead to certification. Informal learning may be intentional, but in most cases it is non-intentional (or "incidental"/random).

Supporting lifelong learning for all requires a learner-centred approach, which aims to provide relevant and high-quality learning opportunities equally for everyone (European Commission, 2001). This would mean shifting from formal education provision to supporting learning opportunities as needed by the learner, for example regular learning phases throughout his/her working life. More attention should also be paid to informal learning, as it can be said that people are learning something all the time. Hence, lifelong learning is not only about older people, although they are the focus of this report. More and more employees need to update their skills after formal education in order to fulfil work requirements in a knowledge-based society. Additionally, people develop the skills and attitudes for learning through the activities they carry out in life, in line with the idea of the life course perspective. Learning and learning

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[10] Flash Eurobarometer Series no. 198, 2007, Survey on Higher Education Reforms Special Target Survey.

[11] These definitions are based on European Commission (2001) and ISCED97 Glossary at http://www.uis.unesco.org/TEMPLATE/pdf/isced/ISCED_A.pdf

to learn are important tasks for everyone, and contribute to our ability to stay active even in old age.

The EU objective for participation in lifelong learning by 2010 is 12.5% of the working age (25-64) population (European Council 2003). The rate of participation has been growing during the last few years and the EU27 average in 2006 was 9.6% (Eurostat, 2007). However, the Labour Force survey shows much higher rates if non-formal and informal learning are also taken into account. As illustrated in Chart 2, on average 32.5% of all respondents said they were participating in informal learning activities, which raises the number of people participating in any learning activity to as high as 42% of working age EU population. Overall, informal learning is considerably more common than participating in organized learning activities. This is especially true for older age groups. Thus, it is very important to consider informal learning situations and opportunities, both for intentional and for non-intentional learning when aiming to support older people's learning.

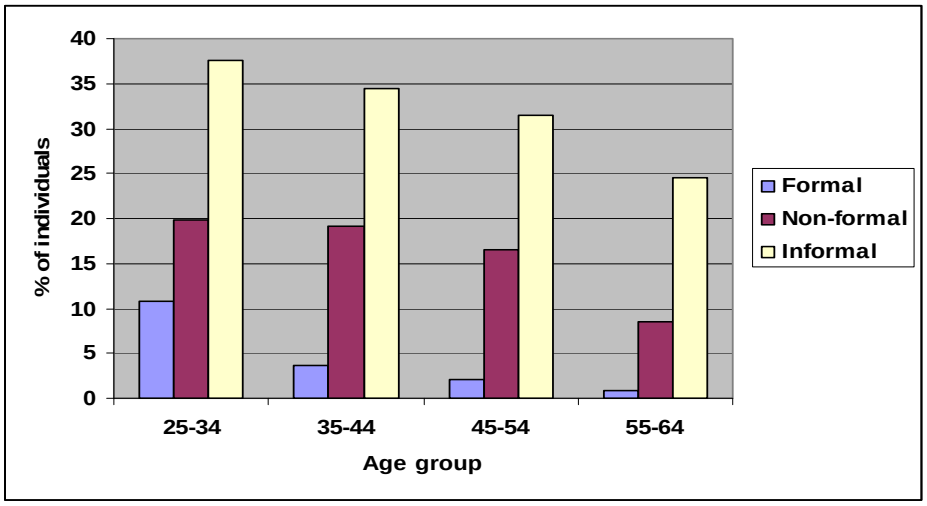

Chart 2: Participation to different learning activities by age in 2005 (Eurostat)

Learning needs and motivations of older people

Older people's motivation to learn depends strongly on how useful they perceive the learning results to be, and also on whether they think they are capable of achieving these results. Unlike young learners who are often following specific curricula in formal learning, older learners can more often freely decide if, and what, they want to learn. Hence consideration of older people's learning needs and motivations is of utmost importance when developing learning opportunities for them. As introduced before, different learning-related needs can be discussed in terms of learning to know, learning to do and learning as an activity.

The oldest of the older age groups are especially interested in learning to know about issues relating to their personal well-being, such as health and safety (Boulton-Lewis et al, 2006). They are also interested in learning about ageing and about cultures and politics, to understand better the society and people around them. Younger senior citizens are often interested in learning languages, and other "new things", possibly supporting activities such as travelling. Technology is not considered as an important learning need as such, but it can be seen as more interesting if it provides a new means for activities, e.g. for communicating with the family or for working and interacting with other people in the community. Younger senior citizens are often more interested in "keeping up-to-date" with ICT, which may relate to the fact that they are often still working. In addition to the specific learning needs that older

people themselves perceive, there are other learning needs they may not know about but which are important from the viewpoint of society e.g., information on resources and services which could improve their independence and quality of life.

Learning to do practical tasks is very important for older people, who may often find themselves in new situations (e.g. after being widowed) and with new tools to cope with. For example, managing money, organizing transportation, or using new house appliances require learning (Boulton-Lewis et al 2006, Purdie & Boulton-Lewis, 2003). Also changes in older people themselves create learning needs, e.g. how to use aids for compensating disabilities, how to take care of one's safety or how to deal with other people (Boulton-Lewis et al. 2006). Learning needs relating to daily activities were seen as especially important for the oldest age groups, while the younger respondents (50-64) interests were often related to organizing travel, holidays, and different leisure activities. Senior workers also often need to learn new (often ICT-based) working methods and tools to perform well in their job.

As a third perspective, the act of learning can often be a goal in itself for older people. Older people may see learning as a way to stay active and to avoid being left behind and isolated. Engagement in meaningful activities contributes to good health, satisfaction with life and longevity, and learning is often perceived as keeping the mind more active. The phase of life after retirement may also offer older people the chance to finally go to university or to pursue studies that they were interested in but unable to pursue before. Learning activities also provide the opportunity to interact with other people, and to be socially active. Moreover, studies have shown that older people want to participate in learning as a way of "giving back" to society, to use their skills and share their knowledge with others (Boulton-Lewis et al, 2006). In the working environments especially, the in-depth knowledge of older workers would be very valuable for younger workers, as the emergence of new tools does not necessarily disqualify the importance of knowledge built with long experience.

Barriers for learning among older people

There are various personal barriers that affect older people's learning, and reflect the diversity of older people. Different people have different types of barriers. Hence, when developing learning opportunities, it is important to consider many different types of learners and to try to identify the most important needs and barriers of the target group in question.

One of the consequences of ageing is an increasing number of problems with physical health. Physical limitations in hearing, sight, and motoric skills may cause problems for accessing learning resources and for participating in learning. In addition, cognitive abilities, such as working memory, reasoning, and speed of processing information decline with age, which can make it more difficult for older people to learn new things. However, the pace of these changes is highly individual and can also be reduced with specific cognitive training activities (Willis et al. 2006). On the other hand, older people's knowledge about themselves and their long experience of work and other areas of interest are valuable assets when learning new things, helping them to be more determined when learning. Overall, learning skills do not disappear when people get older, but learning may need more time and more focused approaches.

In addition to health-related issues, personal barriers relate to the existing learning capabilities. Both the surveys by Boulton-Lewis and Eurostat statistics show that gender and previous education affect older people's participation in learning activities; females and the

highly educated participate more. The importance of educational factors may be reflected in the fact that self-managed learning-to-learn skills and general interests in learning develop more among the highly educated, as they are more self confident in their ability to learn. Lack of belief in one's own capabilities was one of the barriers mentioned e.g. by Boulton-Lewis et al (2006). This gets emphasized in a knowledge society where learning often takes place with new tools that are not familiar to the older learners, and require additional learning effort.

One of the major barriers for learning can be the lack of motivation. If a person has already had a long life with first school and then work, he or she may have little interest in going to school again. Formal education is often designed for younger people and the content and the learning approaches of the courses do not necessarily appeal to older people. Instead of going to a specific course, they more often need to learn how to do something practical or need information relating to their present needs in the everyday life. Also the effort required for going to the place of learning may reduce motivation and possibilities for participation. Rather, learning opportunities should come close to the older people, and be easily accessibly both in terms of physical location and relevant content.

Financing is often mentioned as a barrier for older people's learning. Many older people have small pensions and cannot afford to pay for courses or for learning resources and tools. Financial arrangements also often limit the places available on courses for adult learners, as the same budget resources have to cover both younger and older learners in institutions. Similarly, resources for re-skilling older workers or the unemployed looking for work are often scarce. However, positive measures for older people should not be implemented at the expense of younger people's access to learning. For example, there has been discussion in the UK on the question of whether new forms of learning inside and outside of the universities, with reduced fees for older people, discriminate against younger learners.

In addition to budgeting aspects, there are also other dilemmas requiring consideration in order to support working and learning of both the young and the old. On the one hand, learning groups of same-aged people may provide a comfortable environment for learning, but on the other hand intergenerational groups can provide a different richness to the learning situation. Dedicated learning approaches and tools for older people may isolate and stigmatize, rather than support. Any approach must therefore be carefully designed according to the situation.

4 ICT for Ageing Learners

Opportunities of ICT

ICT can be used to support both organized education and informal learning. They can provide new means and ways to improve knowledge and capabilities for practical tasks. Additionally, the ICT-enabled networking tools, such as social computing,[12] provide new ways of being social and interacting with other people. As mentioned before, older people are not often interested in learning technology for its own sake, but when it is a means of doing something, learning to use ICT becomes more relevant.

Different types of learning needs were discussed in the previous chapter. Table 1 gives examples of how ICT can relate to different aspects of older people's learning. Though it is not a comprehensive list, it demonstrates the important potential provided by, and also the need for, ICT in all areas of older people's lives. In the knowledge society, it is important to learn to use ICT in order to reap the full benefit from the resources and services available. ICT in its different forms (computers, internet, mobile phones, CDs) enable new ways of accessing learning resources, both for organized courses and informal learning. ICT can compensate disabilities and also provide more flexible learning models by combining self-managed and organized education, in ways which allow the extra time older people may need for personal processing and reflection.

ICT can be used to support access and methods for organized learning, but social computing applications are also providing new ways for ICT users to participate and create communities, where they can learn from each other. Collaborative online resources (e.g. knowledge resources on photography, collaborative encyclopaedias, cooking or travelling sites, local history memory banks) can gather people together to create, use and improve the resources, learning and sharing knowledge with each other in this online community. All of these provide possibilities for older people to act both as learners and teachers in informal ways in the areas of their interest, and also to form networks of other - older and younger - people with similar interests.[13] In addition, new types of communities and connecting applications are being developed all the time, e.g. skill brokering services between older people and employers.[14]

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[12] See, for example, C. Pascu, D. Osimo, G. Turlea, M. Ulbrich, Y. Punie & J-C. Burgelman (2008). Social computing: implications for the EU innovation landscape. Foresight, Vol. 10, Issue 1, pp. 37-52.

[13] See, for example, Learning Network for Active Aging, http://www.epa.gov/aging/bhc/lnaa

[14] SeniorJob, http://www.seniorjob.fr/

Table 1: Examples of ICT and older people's learning

	Personal (home, health)	Social, Community	Work
Learn to know	- ICT provides new information resources e.g. on healthy diet, medication, developed both by experts and peers. - ICT can provide flexible and immediate access to information resources.	- ICT helps to stay updated about activities of the local and other interesting communities - ICT provides new possibilities to find personally relevant (online) communities.	- Learning about new ICT based working methods relevant to know in one's work. - ICT provides new means to search for information about work opportunities.
Learn to do	- Learning to use online banking and shopping, travel services. - Learning to use fall detectors, digital television, mobile phone, medication reminders. - Learning to use internet for finding information and resources.	- Learning to make free video calls to grandchildren living far away. - Learning to participate to online communities. - Informal learning and knowledge sharing when learning to use ICT with peers or younger family members.	- Learning to use the ICT tools needed in the work tasks, e.g. office applications. - Learning to use ICT for entrepreneurship. - Learning with ICT resources for preparing voluntary tasks in the community.
Learning as activity	- ICT-based brain training games combine learning and entertainment. - Learning to use ICT-based learning resources and applications for personal development.	- ICT enhanced learning in community centres (with intergenerational groups). - Participating in ICT-supported distance learning courses, even aiming at achieving university degrees.	- Updating ICT as well as other skills with training certifications to show updated professionalism. - Learning to teach ICT skills for others.

It is important to keep in mind that ICT-enabled learning does not have to mean working alone with a computer. This would not be popular with those older people for whom face-to-face interaction is an important motivator for participating in courses. ICT tools can be used in places where people gather together for learning and social interaction in a common space. For example in Sweden, there are adult learning centres,[15] which are also very important for older people. These modern learning centres are like brokers for different learning systems, linking local communities and different stakeholders. They are an arena for local development and growth (business, support of NGOs, community work, participation of older people, etc.) and a space for all kinds of formal and informal learning (tutoring, guidance, study mates, stimulating learning environments, e-learning, technology support etc.). In this way, the benefits of ICT-supported learning approaches can be combined with other ways of socializing and sharing experiences with peer learners. These centres can provide social support for learning, especially to those who do not feel confident about their ICT skills or about starting to learn new things.

[15] http://www.larcentra.se/index.htm

An interesting example of ICT promoting well-being and learning for older people is the Japanese example of ICT as a regenerator of the local economy (Shiraishi, forthcoming). In the town of Kamikatsu, the local community has started to collect, package and deliver fresh flowers and leaves for use as decorations in city restaurants. ICT is used as a tool for managing the business, which is producing considerable wealth. The motivation to learn to use ICT in this case is therefore clear, and also the older people of the village are participating actively. In fact, literature shows that, in general, the Japanese approach is very much market-driven (Gassmann & Reepmeyer 2006). The same motivators are also very relevant in Europe. Desire to improve one's wellbeing is a strong motivator for learning. Therefore, developers of learning opportunities should also remember that learning to use office applications, for example, may not be relevant for some older people, but learning to do business in an online auctioning site could be, and would require new types of information and learning for people to be able to do it safely.

As described in the learning spaces vision (Punie et al, 2006), ICT enables a future model of learning as a lifelong activity. This model combines organized and self-directed learning at educational institutions, at work, at home, and in leisure activities, according to the current learning needs of the learner. In this vision, the learner is placed at the centre, but learning is also considered to be a social process where learners are co-producers of learning. It supports flexibility but still acknowledges the importance of guidance. According to this vision, ICT enables all learners to experience learning that is social and connecting, personal, trusted, pleasant and emotional, dedicated to learning, creative and flexible, open and reflexive, certifying the learning results, managing knowledge resources and also inclusive. This vision of learning does not yet exist in reality, but elements of this flexibility and social aspects of learning are beginning to emerge in pilot examples. In this kind of continuous learning through open ICT-enabled communities, older people could play an important role as mentors for younger learners.

Challenges of ICT-enabled learning

The current generation of older people do not often use ICT tools in general, and especially personal computers, which are the most common tools for present ICT-enabled learning approaches. This is clearly an obstacle that prevents them from benefiting from the opportunities of ICT for learning. According to Eurostat, 41% of males and 31% of females in the age group of 55-74 said in 2007 that they have used computers in the previous year, which also demonstrates the gender gap. And as illustrated in Chart 3, computer usage skills in older age groups are low. In 2007, 81% of respondents in the age group 65-74 and 60% in the group 55-65 said that they have no computer skills. Highly educated respondents use computers more and feel more skilled than older people with low education (on average 75% of the highly educated have used computers as opposed to 19% of people with low education in the group of 55-74 year olds in 2007 according to Eurostat). This may also be related to the financial situation of the respondents.

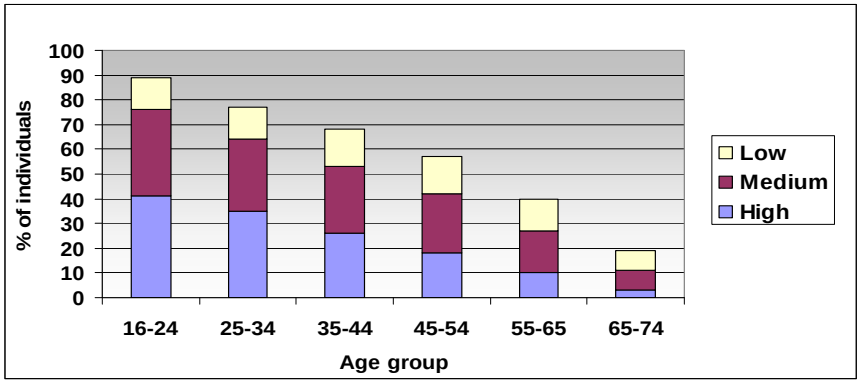

Chart 3: Computer skills of different age groups in 2007 in EU27 (Eurostat)

In many countries, effort has already been made to organize and provide ICT literacy courses for older people and libraries and community centres provide access to computers in many places. However, it should be noted that if ICT usage for learning purposes and participation is to be promoted, then course contents must take this specifically into account. It is necessary to consider different levels of learning needs; basic computer usage, online socializing and media literacy skills (Punie & Ala-Mutka, 2007), as well as software applications and resources relevant for older people. Just providing access and usage skills for ICT does not automatically increase the quality of life of older people (Dickinson & Gregor 2006). They need to be provided with information about relevant resources for finding further activities, such as SeniorNet (http://www.seniornet.org). It is also important to introduce sources for general information, educational resources and tools, in order to provide older people with skills to utilize ICT for informal learning and communication purposes.

Current ICT tools are often not user-friendly for older people, and this makes it more difficult for them to use them for learning purposes or as a part of everyday activities. A practical problem for using ICT is often the user interface, which is rarely designed for older people. It may appear confusing if it has many elements, or the buttons and text may simply be too small for people with poor eyesight and who may have trouble using their hands with precision. The software menus are often complicated, and they may be in a foreign language. All of this can make ICT difficult to use, and it becomes simply too much to think about the content expressed through the tool, at the same time as concentrating on using the tool itself. If using a tool makes the user feel frustrated and conscious of his/her own handicaps, it will not create a positive and motivating environment for learning.

The question of inclusion and exclusion is important when developing ICT-supported learning opportunities. It may be impossible to reach a situation where every older person (or even younger person) will use ICT for learning. Not all people want, or are able, to use ICT (for learning), and they cannot and should not be forced to do so. Promoting places like learning centres also allows both users and non-users of ICT to participate in the community and benefit from ICT-based learning. The conditions for ICT-enabled learning need to be favourable and attractive for all, to encourage new learners to start learning again. In addition to the conditions, the role and goals for ICT usage in learning need to be well planned, so that the requirement to first learn to use the ICT tool will be clearly rewarded by positively enhanced learning experiences. It is important to take into account that ICT-based communication may go against the older learner's original wish to start learning in order to be more in contact with other people. In designing learning approaches for older people, attention should be paid to the needs for traditional personal communication, e.g. by organizing face-to-face meetings between learners and tutors.

5 Broadening the Research and Development Agenda

Developing ICT tools to address the needs of older people

There is widespread debate about the economic potential of appropriate products and services for older people and the enormous "silver" market (Gassmann & Keupp, forthcoming). It is often stated that companies just have to develop the adequate supply (or in other words: tools) to make use of the opportunities resulting, for instance, from the existing purchasing power of the older population. However, ways to convert the learning needs of older people into a strong demand for age-acknowledging learning tools is a complex task for companies and the ageing society. There is a lack of solid research on the economic potential of ICT tools for learning, focussing on older people. More knowledge is needed on the characteristics of this segment of the "silver" market.

Older users would benefit from interfaces that are as user friendly, simple and intuitive as possible. It would be desirable to develop tools that can accommodate differences, be set to use bigger fonts, accommodate slower reaction times, etc., but which could generally be the same for everyone. "Design for All" (DfA)[16] approaches, which aim at basic simplicity of tools, can be very beneficial for supporting people with differing personal needs.[17] "Design for All" is a concept which consists of three strategies: (1) Products/services and applications should be usable by as many people as possible, regardless of age, ability or situation, without any modifications. (2) Products should be easily adaptable to different users. (3) Products should have standardized interfaces, capable of being accessed by specialized user interaction devices. This concept links directly to the political concept of an inclusive society integrating all citizens into the information society. Its importance has been recognized by governments, industry, and the stakeholders of older people.[18] This concept emerged from "barrier-free" or "accessible design" and "assistive technology."

ICT tools for learning should adapt to the needs of the learners, rather than making older learners adapt to them. At the moment, many products and services are designed for younger people, and industrial standards and ergonomics have been typically designed for the 14-49 target group. Most of the few companies which are already active in developing innovative aged-based products and services try to focus on the improvement of the perceived quality of life and learning of specific groups of older people (e.g. people with increasing handicaps). More effort should go into developing products targeted at healthy older people by developing simple self-explaining tools. For example, new types of simple interfaces to computers have been developed in Japan, replacing typical keyboards. Computers combined with the television user interface constitute another example, which could improve the take up of ICT services among older people. Additionally, new learning tools should be thought of - for example, surveys have shown that older people would be very interested in learning

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[16] Other terms quite often used synonymously are universal design, inclusive design, accessible design, universal access and access for all.

[17] The concept was developed at the end of the 1980's by Ronald Mace who was an architect and professor at North Carolina State University and used a wheel chair most of his life (http://www.design.ncsu.edu/cud/about_us/ushistory.htm). For more information see for instance the European Union on design for all in ICT products, services and applications http://europa.eu.int/information_society/policy/accessibility/deploy/dfa/index_en.htm and European Design for All e-Accessibility Network [EDeAN] http://www.edean.org/ and Edean (2005).

[18] The International Federation on Ageing, the most famous international stakeholder network has chosen for its next world conference on global ageing the topic "Design for all". It will take place in Montreal in 2008.

opportunities provided through digital television. Ambient intelligence technologies could also provide many new ways for using ICT and accessing learning in the future (Burgelman & Punie 2006; Cabrera & Rodriguez 2004).

Participative product development is important for developing ICT tools that are easy to use and could be used for learning by older people. In order to get the most benefit from this approach, users should be involved in the whole development process and not only in testing the final versions of the product. It is reported (e.g. Gassmann & Reepmeyer 2006; Gassmann & Keupp, forthcoming) that more and more large ICT companies have started to involve older people in their own development of products and services over the last few years. They are developing approaches to get more detailed information on the specific ICT-related needs of different groups of older people. They use different tools for "communication" and "cooperation" like lead-user workshops, in-depth interviews and focus groups. Sometimes it might be challenging to find the older people's organizations and get them to participate in company-specific or publicly-funded research tasks. For encouraging older people to participate, they should be demonstrated that their voluntary contributions are valued, and their participation costs (e.g. travelling expenses) should be compensated adequately. Other ways of studying their preferences are online platforms, specific environments or normal community environments (e.g. learning centres, which would offer great opportunities for observing and discussing tools for learning for older people).

When developing learning tools for older people, research should study the preferences and needs of all the stakeholders. As learning processes, activities and goals involve also many other elements than simply buying and using ICT tools, there are several groups of stakeholders at European, national, regional and local levels. For example:

- Learners (i.e. older people, both retired and still working seniors) as tool users,
- Teachers who need to design the learning approaches, and mentor learners with the tools,
- Learning providers (educational institutions, workplaces, and associations) which need to acquire and manage the tools, support teachers and learners using the tools,
- Learning tool providers and developers (involved in tool development, marketing, maintenance and user support, etc.),
- Learning material providers and developers (publishers, teachers, the public and also learning providers, etc.).

ICT tool developers would also benefit from pedagogical research into improving the educational usefulness of ICT tools. User innovations should be considered as well. Teachers are in a good position to innovate functionalities that would add effective elements to learning situations, based on their role as moderators, observers and facilitators for increasingly learner-centred learning approaches,. The learners themselves can also provide suggestions for improving the tools. Developing new learning tools in collaboration with all user groups, including older people could then result in higher take up of the tools by older people.

Developing ICT-enabled learning opportunities

Considering the needs of older learners is essential in developing ICT-supported learning in terms of tools, content, and methods for learning. Studying the learning needs of older people in general and especially in local contexts could provide important information for developing better learning opportunities for them. Research should consider the learning content, learning

interactions and the related emotional and motivational aspects. Learning needs to feel rewarding and, for example, efficiency aspects in terms of time are not necessarily very important for older people. Involving older people in planning the learning approaches can bring important new insights into the process and also motivate them to participate in these learning opportunities. This is another way of demonstrating their importance and utilising their knowledge in developing learning for themselves.

ICT has potential for developing flexible learning approaches where both young and old people, pursuing different goals and bringing different experiences, could find it rewarding to work and learn together. However, designing learning resources, mentoring and validation of learning while taking such diversity and flexibility into account, is a major pedagogic challenge, which needs more research. In addition to developing learning approaches targeted at individual learners, developing learning for interacting groups should also be considered, utilizing the potential of learning centres in new ways.

Lack of ICT access and skills is a major challenge for developing older people's ICT-enabled learning opportunities. This challenge needs to be addressed and although the basic lack of ICT knowledge will reduce as the generations change, similar challenges will remain, because ICTs keep changing. Hence, research approaches should not only concentrate on present problems but develop models to study and follow the learning needs of older people in the future as well. The role and importance of lifelong learning during the whole life course and also at the workplace should be researched and developed, as the role of learning in a knowledge society is very important throughout citizens' lifetimes.

As a lot of learning takes place outside organized courses, research efforts should also be directed at supporting the development of informal learning opportunities for people who do not specifically want to attend courses but still need to learn. Developing information and learning resources and offering them through communities, local meeting places, and ICT platforms could be a way of supporting independent living for older people and raising their interest in further learning. Also different kinds of activity programmes for older people could include more learning components and inform them about learning possibilities with and without ICT.

Intergenerational learning is an important aspect that needs attention in a society where there are active and healthy people from several generations working and learning. Interaction between generations provides two-way learning on and around learning topics, and the sharing of tacit knowledge.[19] In workplaces especially, gradual retirement schemes and mentoring would provide older people with possibilities to share their knowledge with younger workers. This process could possibly be facilitated by ICT. Older people also have a lot of knowledge about cultural heritage and history that could be shared with younger people, for example, creating in collaboration new ICT-based knowledge resources for future generations. All in all, more research should be focused on ways of using the knowledge of the older people who could teach each other and younger generations. This could be a rewarding activity for all, for which ICT also provides new potential.

Specific research efforts are needed to address the aspects of inclusion. There are divides among older people in the use of ICT in general and in learning. Efforts are needed to close the usage gaps relating to gender, education background, financial aspects, rural vs. city areas,

[19] See, for example, the work of the Eagle project, http://www.eagle-project.eu/

etc. Developing ICT-enabled learning should not amplify already existing divides. The goals should be to get new groups of older learners involved and to improve ICT skills and access, learning skills and social participation opportunities for everyone in the ageing society.

6 Concluding Remarks and Policy Suggestions

This report has explored the possibilities ICT-enabled learning can offer older people. Learning can be seen as an essential element in ageing societies both for older people and for people interacting with them. Learning contents and methods have changed rapidly over the last few years, becoming more ICT-based and, recently, more community-based as well, promoting informal learning. Lifelong learning is becoming increasingly important for everyone, but older people often need dedicated support to be able to plug in to learning again, especially with the new tools. The diversity of older people needs to be taken into account when developing ICT-enabled learning opportunities that are relevant and accessible for them.

Older people's learning needs and the barriers to learning they come up against have been discussed in this report. It has indicated the research areas that need to be addressed for developing tools, approaches and policies in this area. People interested in learning as such, and also people who are not specifically looking for learning opportunities, should be empowered to learn. These people could be reached more effectively if learning on different organizational levels was offered. First, it is important to empower individual older learners by providing them with the necessary skills and relevant learning opportunities. Second, learning opportunities should be developed and the learning resources and places provided to empower different groups, social networks and small communities. Finally, older people's learning should also be empowered in larger scale networks, accessible platforms, educational organizations and companies, in ways that are meaningful for all stakeholders.

The following policy suggestions are identified to improve older people's quality of life through ICT-enabled learning:

- Supporting local communities: Local communities can support older people's learning and well-being, and are very important when studying the needs of older people. Allocating resources for community networks, increasing the number of local meeting places and learning centres with ICT facilities would give concrete support to older people, for learning with ICT and about ICT, both with peers and younger generations. These communities may provide connecting points for all the stakeholders, and could be linked with, for example, the Third Age universities in the area.
- Encouraging ICT-based networking for communities: ICT communications provide resources and connections additional to those already available in the local communities, and offer more versatile social and learning opportunities to their users. ICT can provide the means to build communities over distances, between people who want to share experiences with, or learn from, each other. Senior citizens' organizations could be funded to develop and maintain platforms for informal knowledge exchange and also for more organized learning. These networks could be supported to organize training for their members in relevant ICT skills and function as a channel to systematically inform older people about ICT-enabled learning opportunities and resources.
- Promoting ICT-related learning opportunities and their benefits: People who participate in lifelong learning are often already more highly educated and more aware of learning possibilities and methods. Hence, developing new learning opportunities for people who are already interested in learning may even deepen existing divides. It is important to develop programmes and actions for people who, as yet, have not been participating in lifelong learning activities, as they need more encouragement and support. This could be

done by providing additional mentoring and financial support for accessing ICT tools for learning and learning situations in general.

- Developing the content of ICT literacy courses: In order to encourage older people to participate in the information society, ICT literacy courses and also informal learning opportunities for learning to use ICT are increasingly important. There is a need to bring learning opportunities closer to old people and special attention should be paid to course content. The personal value of courses and older people's motivation to use ICT could be increased by including information about other learning opportunities and incentives for using ICT, such as relevant resources and communities available through the Internet for older people.
- Funding R&D projects: There is a need for R&D that goes beyond existing market-oriented tool developments. R&D should involve all the relevant stakeholders to study the needs of older people, technical possibilities of tool development, pedagogical models for learning, and communities for networking and involving older learners. In addition to tools, models for organized learning, interaction situations for informal learning as well as resources for self-managed information searching need to be developed in order to support different types of older learners and their learning needs.
- Holistic policies: As the role of learning is changing and the importance for lifelong learning for all becomes emphasized in the knowledge society, there is a need to develop policies to support learning in different environments and for different groups of people. Younger learners today will be the ageing learners of tomorrow, and supporting lifelong learning throughout the learning and working life needs holistic approaches, encompassing different policy areas relating to education and training, employment, inclusion and health policies in the European information society.

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Abstract

The report argues that ICT have an important role to play in developing learning opportunities for older people in an ageing society. It points to both opportunities (e.g. more individualized learning) and obstacles (e.g. not user-friendly ICT) as well as to the need to involve all actors in the development of ICT-enabled learning tools. It concludes that holistic policies are needed to support learning opportunities in ageing societies, enabled by ICT.

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