

27 Educating elderly on new technologies

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27.1 Abstract

Human being is characterized as an evolving species and this is the reason he thrives on our planet. Two are the main components of the evolution. Knowledge, which is produced by the continuous flow of information and technology, which aids people to their lives and is destined to make them easier. However, technology is moving forward in a rapid pace and there is not possible for everyone to attend and absorb it. The new generations of younger people are born within the technological advancements, therefore it is more natural for them to adopt to the evolving technological environment. Older people on the other hand are not so used of the technology and the pace necessary for them to absorb it is significantly lower. Various education programs, that are organized all-over the world, make effort to cover this gap as much as possible by introducing new technologies to elderly.

Focusing on the age group of elderly people, the aim of this paper is to identify the main attributes that characterize the educational programs on new technologies that are directed to this specific audience. As soon as a common ground on the most appropriate way of structuring such programs is set, some cases of on-going educational efforts from various countries are going to be mentioned. And along with the presentation of some statistics regarding the adoption pace of new technological advancements by older adults, the most popular assistive technologies are going to be analyzed. Finally, the role of artificial intelligence in this on-going process is going to be examined.

Keywords: elderly, education, older adults, programs, new technologies

27.2 Introduction

Human by his nature is characterized as an intelligent species, therefore he never ceases to seek knowledge in order to improve his way of living. The best way to reach to knowledge is through education. And by education we do not mean only the given knowledge we absorb from certain structures such as schools, but also every little pieces of knowledge that man can extract from his everyday experiences. Fortunately thanks to technology every form of education is now approachable by anyone. Education meets no barriers either of age or of disabilities and anyone that is really interested to seek knowledge can reach to it. Through internet people can access various databases of information, digital libraries and can form communities where they can exchange this information.

A hundred years before Socrates, Solon of Athens said “I never cease learning as I grow old” and this is exactly what people should always do. Both technology and social interaction can lead someone to all the necessary information in order to cultivate knowledge as an extension of himself. However, not everybody can comprehend and utilize technology in the same way. For young people that are born within the technological advancements the absorb rate is faster than the older adults, a fact that generates what it is known as the digital divide. With the proper guidance though and through the various educational programs that are being developed worldwide, older adults can become compatible with the new technologies and be able to pursue knowledge further.

The motivation of older adults to join such programs in order to learn how to handle the new technological devices is big enough, since this is the only way they can keep in touch with their families. It is not uncommon nowadays to see elderly have a successful video chat with their loved ones and it is mainly achieved through these organized learning sessions. The purpose of this paper is to try to locate the main characteristics that formulate such programs and since

the audience they are directed to be the older adults, the first thing that is going to be examined is how the right of education of adults is protected mainly in Europe. Then the proper way of structuring elderly education programs is going to be analyzed along with some practices that are being implemented all around the world. Moving on some statistics are going to be mentioned, coming mainly from Europe, and the most representative examples of assistive technologies for elderly are going to be exposed. Finally the way that artificial intelligence affects the efforts of bridging the gap of older adults with technology is going to be exploited.

27.3 Adults' Education

The target group of this paper, senior citizens, belong to the wide age cluster of adults, therefore it is considered as crucial to offer a definition of the effort to educate adults, as well as to locate the pillars of the foundation that protects the right of adults in education.

When the term adult's education is being mentioned, it becomes clear that the learning audience is different from this of children and this is the reason it is mostly referred as andragogy. Unlike children, adults have the knowledge offered to them by their life experiences and they are eager to be instructed on the way to use this knowledge in the best way.

Adults' education is usually based on the philosophy that the attendants are willing to learn and take any responsibility that an activity like this may have. It is most commonly categorized in three domains, formal, non-formal and informal education. As formal is described any educational process taking place into specific structures, such as learning institutes. Non-formal is characterized the type of learning that is offered by the instructor of a particular team in the workplace, or in social events. And informal is the on-going process that engulfs the learning coming from daily experiences from the interactions of the adult.

In Europe the right of adults to education and knowledge is protected by the European Association for the Education of Adults (EAEA), which recently welcomed the proclamation of the European Pillar of Social Rights that supports the right of anyone to be educated in order not to be socially rejected and must be set immediately on action. It also supports the European Education Area (EEA) act, which makes an effort to strengthen the moral of Europe by ensuring that learning is the target and not strictly education. And the reason is because most of the times the term education is used by European Council to describe the learning process as introduced by the formal structures of schools and universities. Instead the act intensifies the importance of the lifelong process of learning that encompasses all forms of learning for everyone.

In this context EAEA proposes that EEA should be linked with the existing policies in lifelong learning in order to certify that any learning effort engulfs flexible learning pathways and proper validation. With a target to increase adults' participation in lifelong learning to 25% by 2025, EAEA proposes that European Commission should form a governmental structure in order to ensure that member states engage in the most appropriate way all the stakeholders of lifelong learning. Furthermore this structure will make able for member states to increase the expenditure on lifelong learning programs, by contributing more to the Erasmus+ and European Social Fund that support the participation of adults in lifelong learning. It is also crucial to strengthen non-formal organizations on lifelong learning, as they are the constant providers of better education, training and lifelong learning systems that Europe needs.

27.4 Structuring Education for the Elderly

Senior citizens is a particular target group and anyone should bear in mind that they demand more time in order to get familiar with anything new, especially when this regards technology. Their pace of learning is by fact not the same as a younger person who is surrounded by technology from the early days of his life. Usually older people are reluctant to seek for help as they consider being taught by younger persons as humiliating. The best way to approach them is to try to identify the reasons they want to use the technology, which most of the times is to maintain contact with close friends and relatives, therefore this could be a very good

starting point of introducing them to new technologies. Also older people may think that any technological advancement is not good not only for them but for everybody and thus show some denial in the usage of it. Instructors should aid them overcome their fears of building on trust to technology step by step. Using suitable guides specifically made for this reason is the most appropriate way to help seniors get away from the shadow that their fear cast. Moreover it is crucial to avoid the use of technical terms because this will lead elderly to greater confusion and mistrust of the technology, which can be overcome by understanding their puzzlement and offering simpler explanations.

Generally in any effort to construct a suitable education program for elderly should be based on the following principals:

- Instruction should be broken up into small units with specific goals and the new information must be related to the existing knowledge of older adults
- Sufficient time between instructions should be allowed, for older adults to comprehend the new information
- More pauses during lectures should be provided so as to allow older adults make notes and any questions they consider necessary for their effort to understand the new technology
- Any reading during the instruction should be minimized
- Enough time for practicing each unit should be allowed
- Sitting and equipment should be set in a way that is more comfortable to the senior citizen
- The selected computer programs must have graphical interface and readable font
- Older adults should be familiarized with online help features that accompany most computer programs
- Proper classroom environmental conditions should be set, like minimum necessary movement, right temperature and sufficient lighting

27.5 Practices around the Globe

27.5.1 United States of America

It is considered of great importance to keep elderly well educated on technology and the use of it in order to be able to keep in touch with their families, especially in America where the distances are spacious and there are cases that the young ones live in a different state. Every state organizes seminars trying to make older adults feel more comfortable with technology. The initial idea is to present them things that they will trigger their interest, like how to make a video-call through Skype so as to keep in touch with friends and family, how to search interesting topics on various sites like the Pinterest, how to use Facebook effectively and other features that can make their lives more comfortable. In some states the classes to the elderly are free of charge, like in New York where Older Adults Technology Services (OATS), a non-profit organization in Brooklyn, makes an effort to familiarize elderly with the new technology. Most of these programs are adoptable to the particularities of every single one of the attendants. For example they are equipped with technology that can offer to people with hearing loss the same experience on the Internet that any other older adult can taste. Apart from the OATS program in New York there are several local classes and workshops organized all around US, like the Oasis Connections and AARP TEK Workshops which are free of charge and cover various technological aspects. Also Lifelong Learning Institutes in affiliation with universities and colleges offer educating programs for older adults free of charge as well. The organization SeniorNet offers online computer courses in more than thirty cities, however, there is a minimum subscription fee that is required. Similarly there are other Online Instructional Services provided to anyone that is willing to pay a minimum amount of money in order to attend some online courses on various technological subjects. Furthermore in the bookstores anyone can find plenty of How-To Books that include analytical steps and pathways on using the technologies.

Finally worthy of mentioning is the fact that in some states local educating facilities and schools offer to older adults the chance to be educated by students, so as to make the first ones understand more things on technology. Like in California where a group of teenagers from Carmel High School sets up private or group forty-five minutes sessions, in order to train the elderly on the use of new technologies like the iPads or smartphones. Through these sessions the teenagers are feeling that they are offering for a good purpose and also can enhance their understanding and relationship with senior citizens.

27.5.2 Singapore

In June of 2017 Infocomm Media Development Authority in Singapore released a portal including online guides, eBooks, videos and seminars, aiding seniors in their efforts to use mobile and digital technology. The structure of the site is really simple, so as to be exploitable by anyone, and the font buttons are large enough, as well as the instructions are pretty clear. The portal cooperates with People's Association Active Ageing Council and is actually the outcome of a successful series of classes on technology that began in 2007.

27.5.3 Europe

As in the rest of the world the problem of Europe is its ageing population, which is increasing in a really fast pace. Therefore the goal of any successful program is to assist the population into ageing well. This is the purpose for the Active and Assisted Living Program, which makes an effort to equip seniors in Europe with the necessary knowledge on how to operate with the new technology. In order to keep older adults active AAL introduces a series of projects, like "We Care" that targets in getting elderly to participate more in online and off-line social networks. The seniors who attend these projects tend to commit more to the target of it, so as to enjoy a healthy and active social life. The projects cover all European countries and they expanded to Canada and Israel.

AAL represents a collective form of action, but apart from this each European country has also developed programs of local character aiming to enhance the knowledge and involvement of elderly in new technologies and social life in a greater extend. In the following section we are going to see some practices that take place in some of the European countries.

27.5.4 Czech Republic

Young students pay home visits to seniors, so as to assist them with Internet and other technologies, in an effort to join the world of the young people with this of the seniors. Usually each older adult have one young instructor so as to build trust and strong relationship and make them feel comfortable to ask any questions that they cannot understand or they cannot comprehend very quickly. For this purpose students are closely supervised and take advice from their teachers, in order to organize a successful slow pace teaching course.

27.5.5 Finland

Very popular in Finland are the courses by young instructors on how to use cellular phones, covering the basics of the communication by cellular phone, and in more advanced levels other features are being introduced, like wireless LAN and camera. Also there are courses about internet banking as the banking sector in Finland is very narrow, therefore people have to learn to complete their transactions online. Finally students are encouraged to be involved in the generation of online broadcastings especially for elderly, with the goal to make the young students feel that they offer to a good purpose, as well as to engage older adults in various kinds of activities.

27.5.6 France

Through various gaming platforms elderly can participate into activities and even compete with each other, maintaining in this way their good health and mentality. Furthermore street workshops gather the memories of elderly either in a written form or captured in a video, audio

even in a photo in order to make a great collection and later on create a story. Also through these workshops elderly are introduced into the use of various digital technologies.

27.5.7 Germany

All over the country computer courses are organized for seniors, covering at least basic search on the Internet, how to create holiday greeting cards, safety in using the Internet, as well as how to use e-mails and operate with links. In addition there are the “Café mit Anschluss” meetings where elderly can learn how to create a website and how to use other digital technologies, like GPS and smart phones. Also some fieldtrips take place to some factories and libraries in order to cooperate with the stuff there and learn interesting things.

Moreover there are the multigenerational homes that act as people hubs for exchanging of ideas and skills and thus close a little bit the generation gap. In these places elderly can boost their social and interactive abilities and become more confident about themselves. Also the German National Association of Senior Citizens Organizations (BAGSO) among its other publications of increasing awareness on the needs of elderly, have published a booklet for seniors introducing them to the digital world.

27.5.8 Poland

The Regional Public Library in Krakow organizes a successful series of computer courses, as well as other seminars with several subjects, among which is the world of new technologies and information society. They aim to improve the inter-generation dialogue, to stimulate the active life of senior citizens and increase their participation in the social life and finally to promote their interest in knowledge and transform it to creativity through the use of Information and Communications Technology.

27.5.9 Greece

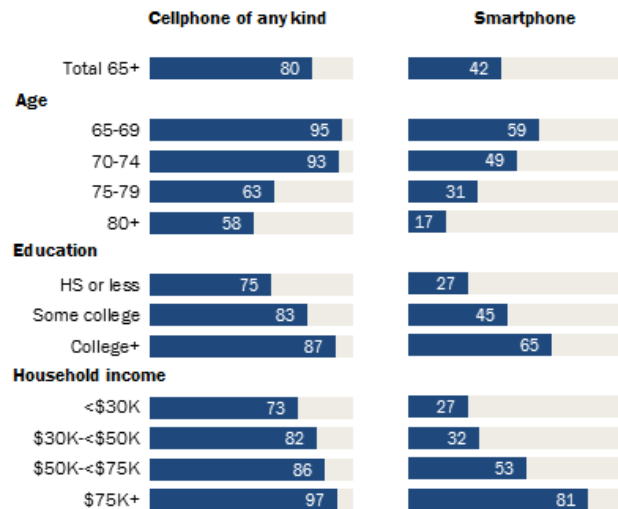
Apart from the computer courses that are organized by each municipality, two are the worthy to be mentioned initiatives in the area of Athens, the free computer courses settled by the Stavros Niarchos Foundation Cultural Center (SNFCC) and the successful 50+ project of Cosmote, a major telecommunications company. At SNFCC people over sixty-five years of age who are technology rookies, can attend the computer courses that cover all the basic needs through simple steps. As for the project 50+ of Cosmote it involves the teaching to elderly by the use of a tablet, in order to make them get familiar to the technology necessary for their communication. The attendants can learn not only how to effectively use tablets but also how to browse the Internet, as well as how to use some other applications.

27.6 Internet Usage by Elderly

Even though seniors seem to be a little bit intimidated by technology and how quickly it progresses, there is an increased tendency all over the world for older adults to use various means of modern technology, not because they like it, but by force, as technology is the only way to keep them in touch with their families, as well as to maintain a good mental and physical health. More and more people of this specific age group join computer and technology courses in order to keep up with the rest of the world. With a slow but steady pace seniors learn how to use a smartphone and even own one.

Roughly four-in-ten seniors are smartphone owners

% of U.S. adults ages 65 and older who say they own the following ...



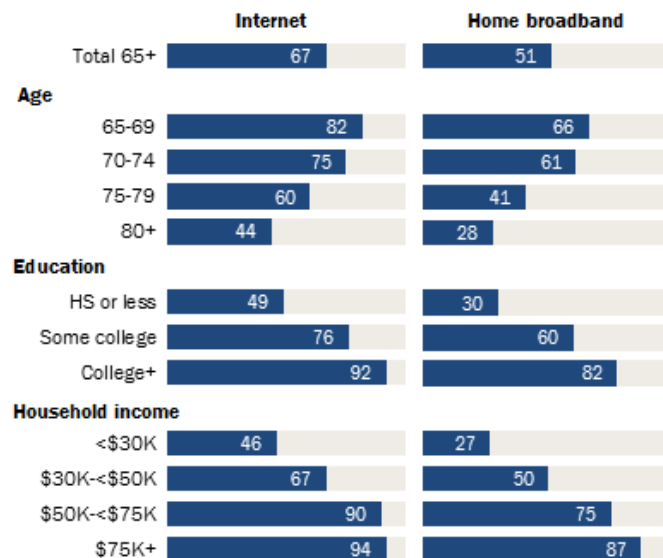
Source: Survey conducted Sept.29-Nov.6, 2016.
"Tech Adoption Climbs Among Older Adults"

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The features of a smartphone may be difficult for them to comprehend but at least they enjoy better communication. Also there is an increase in the percentages of elderly who are able to use the Internet.

Internet use and broadband adoption among seniors varies greatly by age, income and education

% of U.S. adults ages 65 and older who say they use/have the following ...



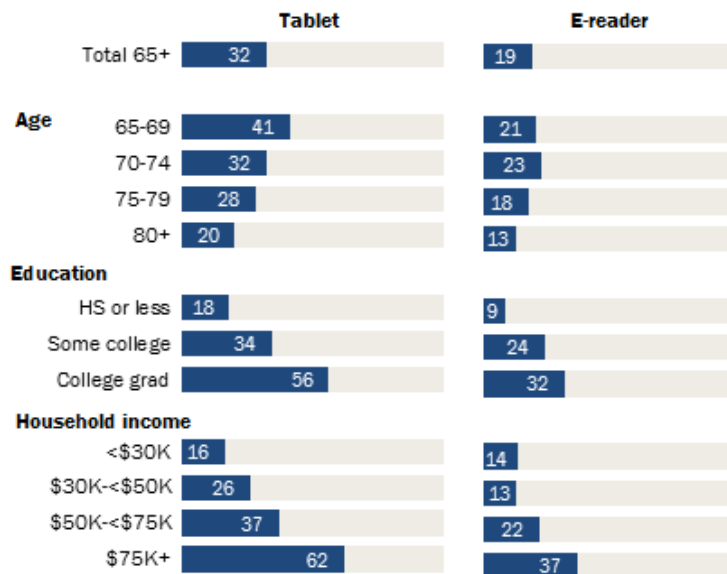
Source: Survey conducted Sept.29-Nov.6, 2016.
"Tech Adoption Climbs Among Older Adults"

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A tendency is also observed in the increase of tablet ownership among senior citizens, as the tablet is larger than a smartphone and have larger application icons that they can clearly see, so as to use them more easily.

Among seniors, roughly a third own tablets and a fifth own e-readers

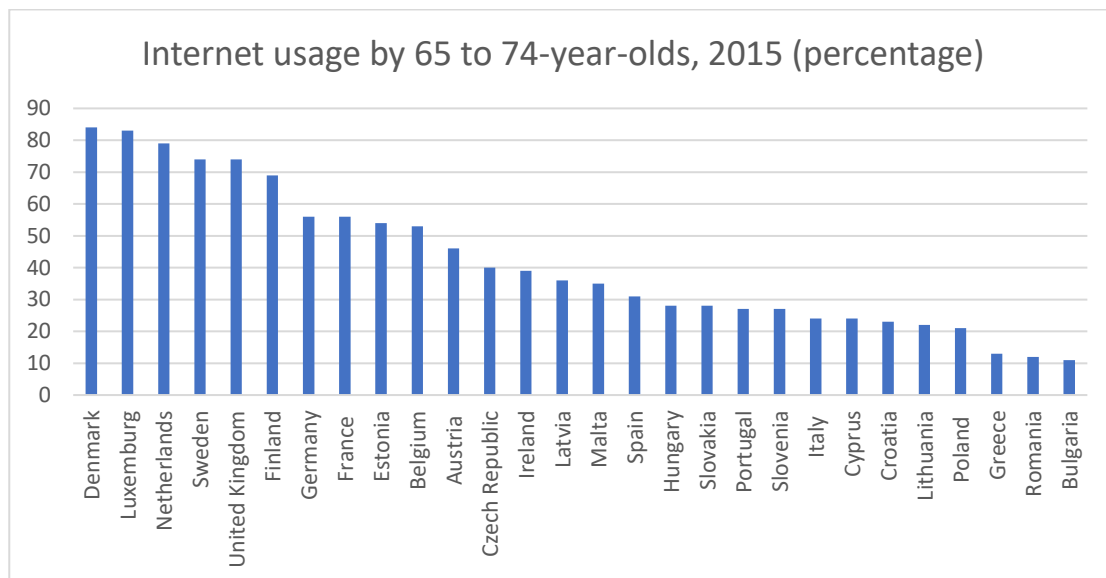
% of U.S. adults ages 65 and older who say they own the following ...



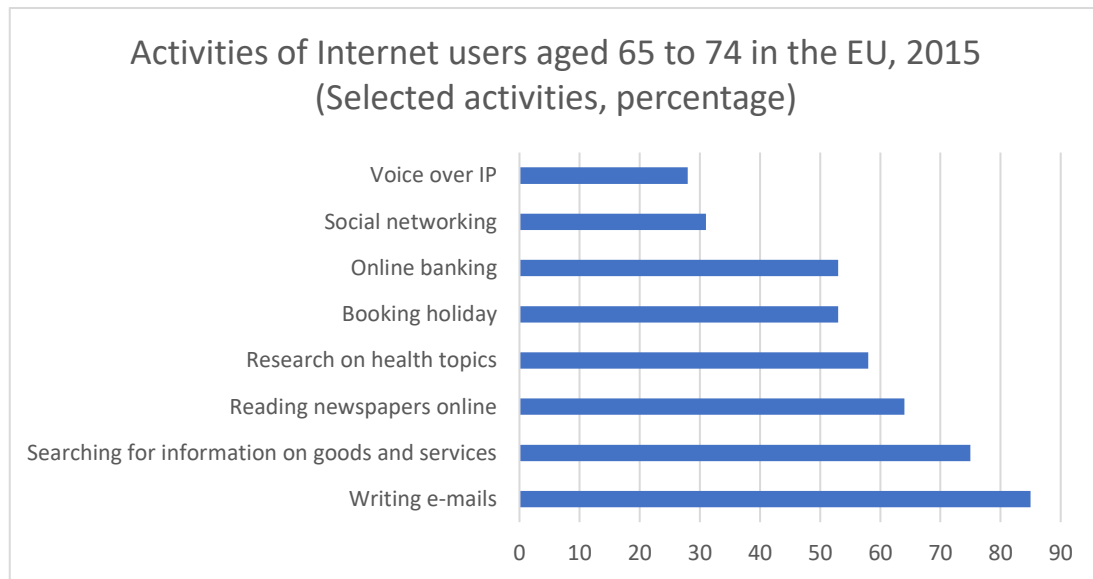
Source: Survey conducted Sept. 29-Nov. 6, 2016.
"Tech Adoption Climbs Among Older Adults"

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Apart from the above statistics that come from the US, we can point out that also in Europe we can find the above tendencies. Especially people from the Scandinavian countries are more privileged, since there lies the heart of the technological development of Europe.



Regarding now the activities senior citizens tend to use online in Europe most of them rely to just sending e-mails, as well as searching the Web for various topics that interest them.



27.7 Assistive Technology for Elderly

As soon as the elderly manage to overcome their fear of new technologies they can find that they are pretty helpful in various aspects of their everyday life, like keeping track of their health status, organize their medication and appointments, help them keep their home environment in a good condition and many others. Slowly seniors are getting involved in the use of devices like smartphones and tablets equipped with GPS and transportation apps, as well as Skype or Facetime, so as to stay in touch with their loved ones, smart watches and fitness trackers, so as to be able to maintain a healthy body status and medication monitors. All the above mentioned technologies are part of the daily routine of every human being, therefore older adults are forced in a way to learn how to use them. Apart from all of these the most characteristic assistive technologies for elderly are:

- Liftware is a specially made kind of cutlery, in order to help people with disability on their hands, or people who suffer from diseases like Parkinson's, by keeping it steady and cutting the appropriate proportions of food, but it can also be used by elderly so as to ease their life.
- USB Dolphin SuperNova Magnifier is a USB device that if attached to any computer can magnify the operating system as well as other features, in order to be clearer for senior citizens and select the proper tool.
- Claris companion is a simple to use tablet that can operate also as a digital picture frame, mobile phone and remote monitoring system, allowing elderly to easily get used to modern technology, with a simple interface and large features icons, so as to help seniors write and send e-mails and use video conferencing easily.
- Roomba is a robotic vacuum cleaner that can be controlled by a smartphone and is a great assistant in house cleaning, not only for elderly.
- Reminder Rosie is a senior-orientated voice-controlled clock which can record up to twenty five different messages and broadcast them at various times of the day.
- Amazon Alexa is a perfect aiding device for people suffering physical limitations either due to age or due to illness. Some of its abilities are reading news aloud, ordering supplies when necessary, displaying the weather forecast, playing music and controlling other smart devices around the house.
- BeClose is an innovative aging in place technology that with wireless sensors can help caregivers and families stay in touch with older adults and monitor them through a secure webpage.
- Fitbit Ultra Wireless Activity Tracker is a smart device that displays real-time activity stats in order to make it easier to reach goals.

- A variety of sophisticated software are produced by Indepeenda, aiming to help caregivers that are mostly remote from seniors to keep track of their daily routine, as well as display reminder messages to elderly.
- TabSafe medication management system is not only a place where seniors can organize their medication, but it can also display reminders for their proper treatment. It is also connected to the personal pharmacist, so as to alert them about the proper medication to be prescribed.

27.8 Artificial Intelligence leading the Way

Technology is rapidly evolving and it affects every aspect of human activity. One brilliant example comes from the healthcare sector, where robotic assistants have been successfully established at most hospitals of Japan and China. Especially with artificial intelligence modern technology can even take the form of a human being. Indeed android robots with human facial and body characteristics have been developed in order to solve the homecare problem of elderly, who especially in Eastern Asian societies are not living in the same place with other family members. In this way elderly can enjoy the illusion of having someone near them and that they are not totally abandoned. However, we are still far from the point of artificial intelligence substituting humans in the healthcare sector. So far they are valuable tools.

27.9 Conclusions

The rapid growing environment of technology is intimidating for older adults, who are not used to the modern technology and they cannot comprehend it as fast as the newer generations. But there are nowadays efforts of elderly to use modern technological equipment, mostly because they are forced to do it as a means to stay in touch with their family and people they care about. All over the world various initiatives are being developed aiming to teach to elderly the main features of modern technology that are important for them. Furthermore continuous advancements introduce necessary technological products that support people in the caring of senior citizens. Only a little bit of encouragement is necessary so as to motivate older adults in using of modern technological means.

27.10 Internet Sources

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