

PUBLISHING

EDUCATIONAL GERONTECHNOLOGY

One of the main targets of *editorial articles* in our magazine is to identify emerging and relevant matters which can enable guidance and stimulation of part of the research that we conduct in Social Pedagogy. Topics as youth leisure, empowerment and active ageing in older people, parental educational styles, ecological citizenship, human rights and social education, etc., have been raised in former issues of the magazine to this end. In the current issue we present a theme that we consider to be very interesting, groundbreaking and socially relevant. The bottom line is related to the progressive technologization of social life and its effects in certain age groups; among them, we focus now on older people.

All lines of investment derived from the defined targets in different international plans call for the implementation of environments adapted to people and, in the case of the elderly, the promotion of sustainable and equitable systems in order to offer long-term care services (home help, community and institutional support). Some of these plans are Europe 2020 strategy, whose priority is to build an inclusive, innovative and reflective Europe (from the perspective of a smart, sustainable and integrating growth), the Grundtvig programme for a lifelong learning; the guidelines of 2030 Agenda by United Nations for Sustainable Development and Sustainable Development Goals (SDGs) for the period 2016-2030, involving every country and advocating inclusive and lifelong education, welfare and healthy life at all ages; the Strategy and Action plan on Ageing and

Health 2016-2020 by World Health Organization (WHO), besides the objectives of the forthcoming Decade of Healthy Ageing 2020-2030, which defines a conceptual change seeking to move from active ageing to healthy ageing under the motto “adding health to years”, etc. All of them are examples of international social policies seeking to foster initiatives of active, inclusive, healthy and functional ageing, founded on the principles of social investment. Part of this investment is aimed at technologies related to digital development, considering them as tools for the solution of social problems arising from the increase of dependency situations linked to age, which exert a growing pressure on the labor market and social and health care systems.

In the background, we find it a matter of political response to a social context of ageing population (according to *Global AgeWatch Index 2015*, in twelve years from now about 1.400 million people around the world are expected to be above 60 years old) and hypertechnology (more than half of global population uses Internet nowadays; about two thirds -4.917 million people- have a mobile phone; one third of global population (37%) are social network users, and 2.549 million of them via their mobile devices, etc. See *We Are Social*, 2017). Both phenomena meet to such an extent that solutions suggested by social policies defined in these forums and international reports in order to deal with population ageing refer to technological innovation generated from research in the use of digital technology and its smart, sustainable

and inclusive use. For this reason, concepts as “age-friendly environments” or “ageing in place” are becoming increasingly common, minding the notion of promoting technological advances which can assure a greater integration and social inclusion of older people, ultimately achieving overall health and welfare.

Therefore, along with concepts as *activity* and *health*, which are very common in mottos and related literature, we can also find today *functional capacity* as basis for autonomy and enhancement of quality of life of the elderly through technological development specifically planned for them. In sum, the main goal of these plans is to generate a functional context supported by digital technology which can enable older people to have a longer and more independent life span, the maintenance of health by offsetting the decline of their capacities and, in short, an adaptive functioning to their daily life.

For this reason, R&D programmes focused on the development of diverse resources related to social studies of science, technology (STS) and applied ethics have been fostered in the past few years. These plans, such as *Science with and for Society*, have been promoted by the European Commission in order to connect science, technology and society through a responsible research and innovation (RRI). Using RRI, the target is to guide the efforts of social science via technological innovation towards the achievement of major social challenges (Chesbrough, 2006). This also involves the engagement of target groups and stakeholders in the different stages of scientific and technological activity (Chesbrough, 2006; Grunwald, 2011, UE, 2012, Owen, 2012).

A clear example of these developments are the so-called assistive technologies such as *Socially Assistive Robots* (SAR), planned to support care processes or to keep the elderly at home for a longer time and based on sensors and monitoring techniques, stimulation and robotics in the context of remote assistance and telemedicine (Edelmayer, 2013; Aceros Gualdrón, 2018). Other examples are personal assistants based on personalized computation (virtual clones), interactive clothing design (bioacoustic technology based on sensors and vibrations (Berzowska, 2004), microchips implants (everyware technologies), genetic modifications to avoid cellular ageing (nanotechnology), development of cyborgs, intelligent and autonomous transport systems, development of quantum computer, Internet of Things, etc. (Martín-García, 2018).

Along with all these independently acting online technologies of older people, there are other developments and efforts which seek to facilitate

a greater social and intergenerational interaction, being the latter the group with higher perspectives for education and social pedagogy. This socioeducational interest features a need to avoid social exclusion, which arises from adjustment problems of the elderly towards changes provoked by technological development. Advances in biogenetic research, artificial intelligence and human-machine interaction are an example not only of social construction of technologies, but also of the existence of a increasingly artificial or virtual world, which disturbs and leave many people behind. According to Peter Lash (2001:107), in this new world, the “technological forms of life” set the tone for our relationship with the environment, conducted through interconnected technological systems, which are forms of life based on distance, where certain aspects, such as sociability or personal identity, cannot be achieved in the absence of specific interconnected and technological systems. This situation has been underlined in many researches in the past few years (Ferreira, 2008, Sierra, López-Pellisa, 2016). The book entitled *Patologías de la realidad virtual* by López-Pellisa summarizes and describes some of the risks or excesses which can arise from virtual reality.

Easy connectivity and ubiquity of digital technology have raised interest among researchers in order to analyse routinization processes of technology linked to socialization and ageing processes. From this standpoint, investigation aims to discern how the elderly can incorporate technology, as well as to deal with the challenges it spurs, given that even though they are socially, culturally and functionally very far away from these devices, they are forced to manage situations of daily life in which these digital tools are irrevocably present. The curious and paradoxical aspect of the case is that by condemning the risks and difficulties linked to technological life (clear sign of 21st century), we note that the development of digital revolution plays a fundamental part in the change from a negative traditional and prevailing view of old age, based on the idea of inability, to a more active, healthy and participative perspective of old age.

After all these ideas and technological developments, a new scope in the field of science and technology seeking to promote innovative solutions to deal with complex demands of especially vulnerable population groups (older people and people with specific functional needs) has been gradually built up. This emerging field of scientific and technological development is Gerontechnology, defined as the multidisciplinary study of ageing and technology for the adjustment of community environments where people live and work

(Lawton, 1998; Bronswijk, et al., 2009; Kwon, 2017, etc).

Even though it is a new field of research and multidisciplinary intervention, two elements support its importance. On the one hand, the existence of a solid International Society for Gerontechnology (ISG) founded in 1997, which biennially organizes the World Conference of Gerontechnology and whose target is to promote culture and scientific exchange of professionals concerned on exploring how technology can enhance quality of life and welfare of the elderly, preserve autonomy and sense of security, improve efficiency and effectiveness of health and social services. On the other hand, the research activity conducted by the *Journal of Gerontechnology*, published since 2001.

The report published in 2003 by the National Research Council of USA entitled "*Technology for Adaptive Aging*" identified six areas of development in Gerontechnology called "life domains": communication, employment, health, learning, living environments, and transportation. Every area is experiencing an increasing growth in the academic and research field, concerned on identifying effects and implementations of smart technologies to the enhancement of the quality of life, specifically of people over 75 around the denomination of Technologies for quality of life (Kanade, 2012 ; Schulz, 2013) in care areas, which enable psychological comfort and the improvement of social interaction in the old age. From this perspective, the nearest growing field to the educational

sphere is the development of the so-called E-leisure and entertainment, through technological devices based on videogames, digital games and interactive games online for the elderly (Delahunt et al., 2009; Blocker, et al., 2014).

The basic idea of these programmes and games is not only to foster entertainment, but also interpersonal and intergenerational relationships and learning processes on diverse aspects, such as health or environment. However, the educational potential of many of these innovations is yet to be explored. Some advances regarding digital games exist (particularly the so-called "serious games" such as brain-trainers, *Brain Age*, *Cogmed*, *Lumosity*, etc; see the magazine *JMIR Serious Games* (JSG, ISSN 2291-9279), although it seems obvious that entertainment in certain cognitive and functional areas, and the social support that these resources can bring, offer teaching interest prospects that should be better considered in order to enable a smart use of technology, to either help the elderly to know and use the existing devices and resources or develop new products better suited to their needs. In this way, our magazine encourages to add a pedagogical approach to advances in other fields regarding gerontechnology, resulting in educational proposals of applied research in the pursuit of innovative solutions to the challenge of an ageing society, to the complexity of ageing processes and to the requests of older people for a healthy and independent lifestyle, as the basis for a sense of belonging, autonomy and social integration.

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