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Using communication and visualization technologies with senior citizens to facilitate cultural access and self-improvement

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ABSTRACT

This paper presents the results of research that explores the social impacts and benefits of using digital visualization technologies, which include Augmented Reality (AR), Virtual Reality (VR) and Quick Response codes (QR codes). The target group for this study was senior citizens in an adult day care centre. This group was selected for two reasons: firstly, for belonging to a generation that has not grown up surrounded by digital technologies; and secondly, for therefore being at a disadvantage when it comes to adopting and using modern day information and communication technologies. Research was focused on the potential benefits of digital technologies and also on how senior citizens responded towards them, in particular how they felt these technologies were improving their social and personal well-being. Digital technologies were introduced into the day-to-day lives of senior citizens, providing them with a variety of alternative ways to access social media, communication tools or cultural content. Using digital technologies, they were also asked to perform activities related to their own personal and social well-being.

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1. Introduction

The world of technology has opened up truly great advances for societies across the globe, however senior citizens are unable to fully enjoy what is on offer as a result of showing reluctance towards using smartphones or tablets, which are devices now so commonly used elsewhere in society on a daily basis. Generally speaking, it is the younger generations that embrace these devices and the technologies and services that go along with them. As a result of their reluctance to embrace this type of technology and everything that goes along with it, we see senior citizens becoming more and more isolated from modern society, a place in which understanding different forms of communications has become vital, be it via the Internet or via other Information and Communication Technologies (ICTs) (Saracchini, Catalina, & Bordoni, 2015).

Social and cultural isolation and feelings of loneliness are common problems for many senior citizens (Cattan, White, Bond, & Learmouth, 2005). The problem becomes all the more serious, as already mentioned, when you add to this fact that modern society

now tends to revolve around information technologies. The fact is that for one reason or another, senior citizens are being distanced from these technologies. In some instances this distancing is due to personal circumstances and the limitations that the individual faces or has imposed on themselves, and in others it is due to those that have been subconsciously imposed on them by society at large (Blaschke, Freddolino, & Mullen, 2009; Ruppel, Blight, Cherney, & Fylling, 2016). One issue that is seen is that despite significant and important technological advances over the last 15 years in the technology being used in mobile phones and other newly emerging technologies, the tendency is that those aged over 60 encounter difficulties when it comes to keeping up with the pace of all these technological advances (Helsper, 2008). The result is that they are being excluded from enjoying these technologies and any advancements being made. In terms of communication, this has widened the gulf separating this social group from other social groups, in particular younger individuals more familiar with all things technological, and also middle-aged individuals who are also regular consumers of technological products. Therefore, amongst other things, this digital divide results from differences that exist between the generations in both their 'understanding' and 'use of' information technology (Lenhart, 2009; Lenhart, Purcell, Smith, & Zickuhr, 2010).

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The immediate causes of social isolation are numerous and very much depend on an individual's personal set of circumstances. If we were to name a few examples of factors that could lead to social isolation these would include: having relatives scattered across different regions, the death of a friend, a chronic health problem, difficulties seeing or hearing, etc. Whatever the cause, all of them lead to feelings of loneliness and isolation, which are proven to have a detrimental impact on the lives of senior citizens (Tracy & DeYoung, 2004). Lines of research that deal with the isolation of senior citizens (Findlay, 2003; Helsper, 2008; Victor, Scambler, Bowling, & Bond, 2005) document worrying trends:

- Some senior citizens can go for days without interacting with other people, and some die alone.
- As people get older the fear of being alone becomes a significant source of anxiety.
- 9% of senior citizens experience extreme loneliness.
- Certain ethnic groups are particularly vulnerable once they reach old age.
- Isolation and loneliness can harm the physical and mental well-being of senior citizens.

So, the question we should be addressing is how do we ensure that our elderly citizens embrace modern technology and harness its potential to overcome these issues.

Some of the barriers that senior citizens face when considering adopting emerging technologies include: not having Internet access at home; limited understanding about what these technologies can offer them; misunderstanding marketing messages and thinking that these technologies are for young people only; or simple ergonomics and the complications arising from poorly designed devices (Braun, 2013). In this regard, the analysis provided by Helsper (2008) indicates that there are two important dimensions that shape social exclusion: *social isolation* and *economic disadvantage*. Both these dimensions tend to be associated with a lack of basic Internet use and can be linked to different types of disadvantages that emerge in relation to digital technology:

- Individuals become isolated by the speed at which rapid technological advances are being made, and are thus being isolated by the technology itself. Technology is developing at such an incredible pace, but the advances overlook the needs of senior citizens and how they can assimilate these developments.
- The problem of a lack of economic resources needed to pay for internet services, cable TV, mobile devices and services charges, and so on.

In the last decade, several pieces of affordable technology have changed the way in which we interact. Internet and mobile-based communications systems such as e-mail, and social media apps such as *Facebook*, *Twitter* and *WhatsApp*, have revolutionised personal communication between young people. Government policies have also put weight behind technological advancements and helped transform the information society in an attempt to make it easier and easier for the majority of us to access public services using digital media. Unfortunately, senior citizens have been unintentionally excluded to quite some extent from this technological revolution and the benefits it has brought with it. One of the reasons behind this, amongst others, is the lack of policies that provide financial assistance those who have retired in order to help them afford Internet access (Helsper, 2008). Damant, Knapp, Freddolino, and Lombard (2016) argue that the use of ICTs by senior citizens has both positive and negative impacts on their quality of life. Being connected to others and exchanging

information reflects the constructive side to this technology, facilitating their participation in social networks and communities and, as a result, improving their quality of life. Juncos, Pereiro and Facal (2006) state that during the normal ageing process access to computers and the Internet can help people to develop new social connections, and access new windows onto the world via communication tools and activities that are cognitively stimulating. Additionally, these tools provide access to culture, lifelong education, and involvement in activities involving social cooperation. Agudo-Prado, Pascual-Sevillana, & Fombona-Cadavieco (2012) led a study involving senior citizens with the aim of identifying the technological resources they use and to describe the types of use they make of ICTs. They indicate that the technological resources used are: the printer, scanner, digital camera, digital video camera, multimedia materials, and the Internet. In rare instances, mobile phones. In terms of usage, the authors conclude that these resources are used for training, information, communication and entertainment.

However, the impact of new information and communication technologies (ICTs) such as mobile telephones or computers and the Internet on the lives of senior citizens is still inconclusive (Ji et al., 2010), although what is clear to us as researchers is that when it comes to the use of virtual visual technologies like Augmented Reality (AR) or Virtual Reality (VR) research and findings are nearly non-existent. That said, if we turn our attention towards research there is a noticeable trend towards creating AR apps for senior citizens, but nonetheless, they do not go on to have widespread reach and use (Gamberini et al., 2009; Im et al., 2015; Van Schaik, Blake, Pernet, Spears, & Fencott, 2008).

This paper presents the results of a research project that explores the use of interactive and immersive digital visualization technologies for the purposes of personalized care. Visualization technologies such as *Skype*, *Google Street View*, AR and VR, to name a few, are relatively novel developments for all of us, but they are even more so for senior citizens as a consequence of these technologies not having existed during their more active years. It is true though that the younger generations and middle-aged individuals are very familiar with these technologies, either as a result of encountering them in their professional lives or because of using them in their free time. In both contexts they are used to source information, communicate with other parties, interact socially with other people, check directions, find out about leisure activities, go online shopping, etc. Generally speaking, senior citizens are not able to interact with these technologies in the same way and therefore cannot enjoy everything that they have to offer. The authors stance is that a short amount of targeted and age-appropriate training that covers the use of apps that are useful to senior citizens and the possibilities offered by today's smartphones and tablets will provide improved quality of life for these individuals, e.g. video conferencing apps to communicate face-to-face with others, apps to access cultural or leisure activities, or apps for entertainment purposes.

The experience shared in this paper focuses on using technology for personal improvement and involves the participation of a group of senior citizens who were selected based on their risk of social exclusion. The target group has been introduced to visual and virtual technologies and trained on how to use them in order to establish and analyse their perceptions on a) how useful they find them and b) how well they fit into their everyday lives in terms of helping them to communicate, find information, entertain themselves, or obtain social assistance. Senior citizens often lack training in digital technologies therefore over the course of this study they have been provided adequate training on how to use the technological devices and applications in question.

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