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Characteristics and usage patterns of older people in a 3D online multi-user virtual environment

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ABSTRACT

3D online multi-user virtual environments (MUVEs) have a lot of potential in supporting older people in their daily lives, yet little research has been conducted to explore how older people engage with this type of technology. This paper aims to investigate the characteristics, user groups and activity patterns (particularly social networks and gift giving behaviour) of older users within a 3D online multi-user virtual environment. Data from approximately 5000 online user profiles of older and younger users from a 3D MUVE, namely IMVU, was collected for analysis. Overall, we identified several distinct patterns of use (e.g. size of social ties, level of reciprocity, etc.) among older users when compared with younger users. We also found that despite the capabilities of 3D MUVEs to provide the users immersion in alternative realities, a feature well embraced by younger users in this study, older users seemed more interested in activities which serve as an extension to their physical life.

1. Introduction

Older people, now one of the fastest growing age groups of internet users, are increasingly beginning to integrate newer forms of online social media into their daily lives. A recent survey conducted by the Pew internet research centre found a substantial growth in the use of social networking and online communication services by users of this age group (Pew Research Center, 2010b). Such technology has benefited older users in various ways. For instance, studies have shown that online web forums have allowed older users to meet people with similar interests and develop supportive relationships (Wright, 2000). Online social network sites have also helped bridge the "generation gap" by providing a platform for older people and their families to interact and stay connected with one another (Pew Research Center, 2010a). The social relations developed through these technologies could play a key role in supporting the well-being of older people in the near future as the ageing of the population would place increasing demands on social and health care services (UN, 2007). One type of online technology, which has become increasingly popular in recent years is 3D multi-user virtual environments (MUVEs). Compared to traditional communication tools, such as e-mails or instant messaging services, the 3D spatial data and interactive avatars (the graphical representation of the users) provided by these platforms offer more diverse forms of interaction, potentially offering a richer and more immersive social experience. Some of the activities available in these platforms could be particularly beneficial for older people. Studies have shown how 3D MUVE have the potential to provide useful health information (Maged et al., 2007), provide access to educational resources for life-long learning and even facilitate productive activities (Freitas, 2008). All these activities could be useful in supporting the independence of older adults by helping them maintain an active lifestyle and delaying the need for institutionalized care. Despite these potential benefits, there has been a lack of research into the use of these platforms by older users. Most studies focus on younger users who often have different characteristics, needs and interests. These factors must be taken into consideration if we are to successfully design MUVE, which would appeal to older adults. Therefore, in this study, we aim to analyze the characteristics, interests and activity patterns of older users in 3D MUVE. More specifically, the objectives of this study are:

a. To investigate the characteristics of older people who use 3D MUVE.
b. To analyze the activity patterns of older people in a 3D MUVE (particularly their social networks and online gift giving behaviour) in comparison to younger users.
c. To identify the main interests of older people in this 3D environment.

This paper is structured as follows; first we examine previous studies looking into the use of online technology by older adults and highlight how their usage of this technology is different from or similar to general users. Then, we review literature related to

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older people and online multi-user virtual environments. Afterwards, we describe the methods we used to collect data for analysis. This is followed by a discussion of the findings and results. Finally a conclusion is drawn and we discuss future research opportunities.

2. Related background

The use of online technology has grown significantly in the past few years. As of 2011, more than 2 billion users from around the world have internet access, an increase of nearly 480% in the past 10 years (Internetworldstats, 2011). In fact, one of the fastest growing adopters of these online technologies has been older people. The number of older users who have now visited social network sites, watched an online video and used online classified ads websites have increased substantially (Pew Research Center, 2010b). As the number of older internet users continues to increase, so does the interest of academic research in this area. In this section we highlight some of the recent studies which explored the use of online technology by older people.

2.1. Older people and online technology

Studies show that older people engage with online technology for a variety of purposes. For instance, older people use the internet to shop, search for medical information and receive news and update about current events (Eastman & Rajesh, 2004). An increasing number of them are also watching online videos, playing games and participating in online blogging activities (Pew Research Center, 2010b). Older people are also interested in using the internet to telecommute, allowing them to remain productive while working with a flexible schedule (Czaja & Lee, 2007). However, one of the most popular uses of the internet by users in this age group is in the context of communication and social interaction. Studies have shown how communication tools such as e-mail and instant messaging software have been used by older persons to re-establish social ties with family and friends living apart (Karavidas, Lim, & Katsikas, 2005). Older people also participate in web based forums to meet people with similar interests and develop companionship networks. This helps them feel more integrated in society and plays a positive role in increasing emotional well-being by buffering stress (Wright, 2000). In regards to the use of online social networks, a recent survey found that 26% of older users from the US who are 65 years or more now use social media such as Twitter and Facebook to reconnect with people from their pasts and participate in health support groups (Pew Research Center, 2010a).

2.2. Age differences in the usage of online technology

As older people have different characteristics, interests and needs, it is not surprising to see them use this technology in a different manner when compared to their younger peers. For instance, studies have shown that although some uses of the internet among older people are similar to younger people (including searching for information or communicating through e-mail), a smaller proportion of older people are interested in using this platform for leisure activities such as playing online games or listening to music (Pew Research Center, 2010b). Certain activities and behaviours of older people in computer mediated communication platforms also reflect their unique characteristics. For instance, a study found that one way older people bond with each other in an online mailing list is by sharing past stories and memories about their lives. In addition, their communication patterns show more formality and mimic those of letter writing, as users in this age group tend to be more familiar with such traditional forms of communication (Kanayama, 2003). Another study found that older people would like to apply the concept of collective memory in the creation of online user generated content. They were interested in creating online content which reflects the past experience of themselves and their community (Karahasanovic et al., 2009). The social networks of older people on the internet are also different from younger users. Studies have shown that older users have fewer friends than younger users in social networking websites such as MySpace and that most of their contacts are people who are in different age group (Pfeil, Arjan, & Zaphiris, 2009). The social network of older users in Usenet newsgroups has also been found to be less dense when compared to younger users and was found to be centred around a few dominant users (Zaphiris & Sarwar, 2006).

2.3. Older people and 3D online multi-user virtual environment

In the context of 3D MUVEs however, there have been few studies focusing specifically on older users. Most of these studies usually investigate the usability of a particular design aspect for older people. For instance, some studies looked into the ability of older people to navigate in a 3D virtual environment and tried to identify ways to improve them (Sjolinder, Hook, Nilsson, & Andersson, 2005) (Liu, Uang, & Chang, 2009). Other studies in this field have focused on using virtual environments to develop tools to support older adults as they age. Examples include one study which used Second Life to visualize information from a collection of wireless sensor networks to present caretakers with a high fidelity visualization of older people in their living spaces (Boers et al., 2009). Another example is a study looking into the use of online virtual environments to develop a rehabilitation tool by using a balance measuring platform to control the actions of avatars. Researchers aim to use this tool to help encourage older people to carry out exercise activities which reduce their risk of falling (Heller, Wheat, Wright, & Mawson, 2008). However, there is a lack of research investigating the characteristics and usage patterns of older people who use this platform for social interaction. One survey about the demographics of users in Second Life which was carried out with 657 people found that older users account for approximately 6% of the population (The Second life Survey, 2007), yet we still know little about who these users are and how they interact with others through this technology. Studies investigating social interaction have mostly focused younger users who are active users of online technology. Due to physical, social and psychological changes which are associated with ageing, it would not be surprising if older users show usage patterns and interests in activities which are distinct from their younger peers. Such factors must be taken into consideration as we attempt to design virtual environments which would truly be beneficial for users of this age group. Therefore, in this study, we attempt to identify the characteristics of older people who use online MUVEs, analyze their interests and activity patterns.

3. Methods

To identify the characteristics and activity patterns of older people in an online multi-user virtual environment, online user profiles from IMVU were collected and analyzed. IMVU is a social networking platform augmented by a 3D instant messaging service (IMVU, 2011) (A screenshot is shown in Fig. 1). This platform is interesting in the sense that it contains both a 3D virtual world and a social networking element. IMVU can be thought of as a 3D virtual world because it has a shared persistent user space, a large and active community as well as mechanisms which support user-created content and commerce (Spence, 2008), (Sivan, 2008). This platform allows users to create their own rooms and decorate