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# Potential and Challenges in the Integration of Virtual Reality and Augmented Reality for Older Adults as a Part of COVID-19

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**ABSTRACT:** In a health-related context, there are many of opportunities for older individuals to enjoy activities using virtual reality (VR) and augmented reality (AR), such as exercising using games with a health-related theme, connecting with others through digital interfaces, and helping with routine chores. With AR, people may engage with their actual surroundings in new ways, while with VR, they can access new experiences in virtual settings. Because older individuals may gain from VR/AR usage, these people have yet to be included in past VR/AR participatory research. In short, older people were excluded from VR/AR design and development processes due to the fact that these technologies were often still in their nascent stages. In addition, the topic of ageing has seldom been included in this area.

**KEYWORDS:** Augmented reality, Virtual reality, COVID-19

## I. INTRODUCTION

As they live their lives, older people will experience various opportunities and difficulties while using VR/AR technology. An individual's usage, acceptance, and development of abilities linked to digital technologies is necessary to access these systems. When we consider the many differences between older people and younger adults, researchers should be mindful of a few issues, including the age-related preferences and competences of older persons and their actual use levels. We think that older individuals in United States (especially those who are retired) would significantly benefit from utilising VR and AR, but we also feel that there is an existing digital gap between elderly users and younger ones. This is a brief and descriptive article about the possibilities and limitations that older people have while using virtual reality and augmented reality. It encourages creators of virtual reality and augmented reality to pay attention to older persons requirements and preferences.

## II. OLDER ADULTS HAVE MANY ADVANTAGES WHEN IT COMES TO VIRTUAL REALITY AND AUGMENTED REALITY

But as a result of advances in VR/AR technology, older people who aren't employed may benefit from them in their daily lives. It has shown that during COVID-19 pandemic digital technologies and virtual reality (VR) in particular have the ability to enable social interaction, interactive games, and physical activities that are enhanced with VR-integrated exercise, and teleconsultations with physicians when on-the-job assignments are banned.



**Figure: Real time experience with augmented reality [source: Nxtbook Media]**

Virtual reality and augmented reality have great promise in five areas of older people' lives, in my view.

Augmented reality allows you to show both real-world items and animated ones on your smartphone, thus it's a valuable tool in learning about new places. For example, a new study done on the usage of VR and AR for tourism found that it's increasing, and this may apply to older people as well. Assistive devices like AR may be beneficial for people with moderate memory problems or cognitive declines who have difficulty navigating unfamiliar places by showing them details about buildings and locations on their smartphones.

Another possibility is that virtual reality and augmented reality may impact the technique of teaching and improve intergenerational learning experiences that include things like group interests and social contact in the latter part of life. Gerontological study indicates that older people cognitive and learning abilities vary according to their long-term experiences. The organisational approach used at post-secondary institutions like universities, thus, may vary from vocational institutions like technical colleges. Because of this, VR/AR technology enables new kinds of learning aid through VR-based courses, as well as letting users escape to a new virtual world.

Maintaining health and well-being in older people via the use of VR and AR, such as psychotherapy and rehabilitation, helps to promote overall health and well-being. For the sake of elderly folks Training cognitive and physical abilities in older people with minor cognitive impairments is possible using VR intervention programmes.

Gamers and fans alike have taken interest in AR-based games after the success of Pokémon GO and others. Despite this, games using AR have not yet been studied in older people.

Interacting with avatars or embodied agents. Concentrating on older people, it is worth pointing out that older persons are able to have great social connections when they play virtual reality (or augmented reality) games along with other individuals. Seniors with mobility limitations (e.g., after a long hospital stay) may benefit from social tools such as virtual reality and augmented reality that help them see each other and experiences such as virtual reality and augmented reality that enable them to perform activities (e.g., going to a museum) together.



### III. AN INCREASINGLY STARK DIGITAL DIVIDE IS SEEN ACROSS AGE GROUPS

Without a digital barrier between young and elderly people, older folks may never realise the advantages of virtual reality and augmented reality in their daily lives. When they are in the present COVID-19 epidemic, older people may retain social interactions via contemporary technologies like VR and AR, but if they aren't knowledgeable or have the equipment, they may feel alienated in these digital communities.

Because the internet has been widely distributed, access to VR/AR has been more widely available to the general public. As an older adult, you have less access to the internet and cell phones, yet it is still relevant. Only 60% of adults in the age group 50 and older use the internet, according to a study conducted in United States. According to the study, the relationship between age and internet usage is due to personal characteristics, such as age, gender, education, income, health, and previous internet use. Also, the amount of technological socialisation that person has determines how much technology they utilise. Additionally, the Baby Boomer generation (born between the years of 1950 and 1969) has not been socialised into the use of digital technology and grew up at a time when there were no digital technologies. This is true both from a developmental viewpoint and for the inhabitants of long-term care institutions who frequently have daily care requirements and a host of medical complications. As such, people in this age group must take greater effort to master new technology and often deal with the obstacles resulting from their physical, cognitive, economical, and social limitations.

In order to solve the digital divide at the first level, which is concerned with accessibility to contemporary technology, such as information and communications technologies, many of these issues centre on people's usage of these tools. For the second level, we describe the digital use disparities between users who have good or active skills, such as being skilled or being active, and those who have bad or passive skills, such as being unskilled or inactive. The third level focuses on how various groups of people are benefitted by different types of technology interventions (for example, overall well-being or participation in society). With respect to the VR/AR context, the digital divide is not just about having access to VR/AR tools, but also about the use of these tools in real-life situations, as well as one's own personal ability to actively or passively use these tools.

### IV. NEW GERONTOLOGICAL APPROACHES ARE PROPOSED FOR NEW DEVELOPMENTS

When it comes to the obstacles of VR/AR use for older people, they confront unique problems along with the difficulties caused by the broader digital divide. It is noteworthy that the elderly is not a group of similarly vulnerable individuals. Researchers and developers working in VR/AR should use results from gerontological research while studying VR/AR, and include older people at an early stage of the creation of tools. Additionally, there are many considerations for VR/AR research and development that are needed to guarantee that older people' unique views are taken into consideration:

Older people tend to do all of their daily activities without using digital tools, therefore their technological solutions must provide significant value as compared to offline ones. As well, virtual and augmented reality will support their day-to-day tasks.

Consideration for individual requirements and ability levels are both crucial when it comes to providing technological solutions for older people. Although there is currently no research on the utility, acceptability, and efficacy of VR and AR usage among older people, it's critical to start this conversation and find answers.

They differ in their physical and cognitive capacities as they become older. For instance, older people (65–80 years old) do not have all of the mobility issues and hearing or vision impairments; older persons (65–80 years old) in the Third Age (65–80 years). For these reasons, developers should focus on distinct groups of people who use various kinds of tools or settings. Developers should make things easier or find ways to use current aids for older people with visual and hearing problems (e.g., avoid interference with hearing aid devices). According to D'Cunha et al. (2019), older people with cognitive impairments (e.g., dementia) may be vulnerable to being misled by virtual environments that seem genuine.

The effects of cyber-sickness among the elderly may include nausea, dizziness, and headaches. It's likely that older people report cybersickness in driving simulators more often than younger ones, which means they are more likely to experience cybersickness in virtual reality.



When creating a VR/AR application, the living circumstances of elderly people must be taken into consideration. Consider the increased care requirements of the residents and the institutional infrastructure, while developing VR/AR solutions for use in long-term care institutions (e.g., internet accessibility).

Because virtual reality is very new, studies on its efficacy are few. As a means of addressing age-related disparities in digital tools, funding for training, education, and support services for older people who encounter problems with VR/AR technology should be increased. The many studies available on problems associated with technology advancement for older adults are good starting points for VR and AR innovation. Evidence of particular design suggestions, such as medication management techniques for VR/AR, is emerging.

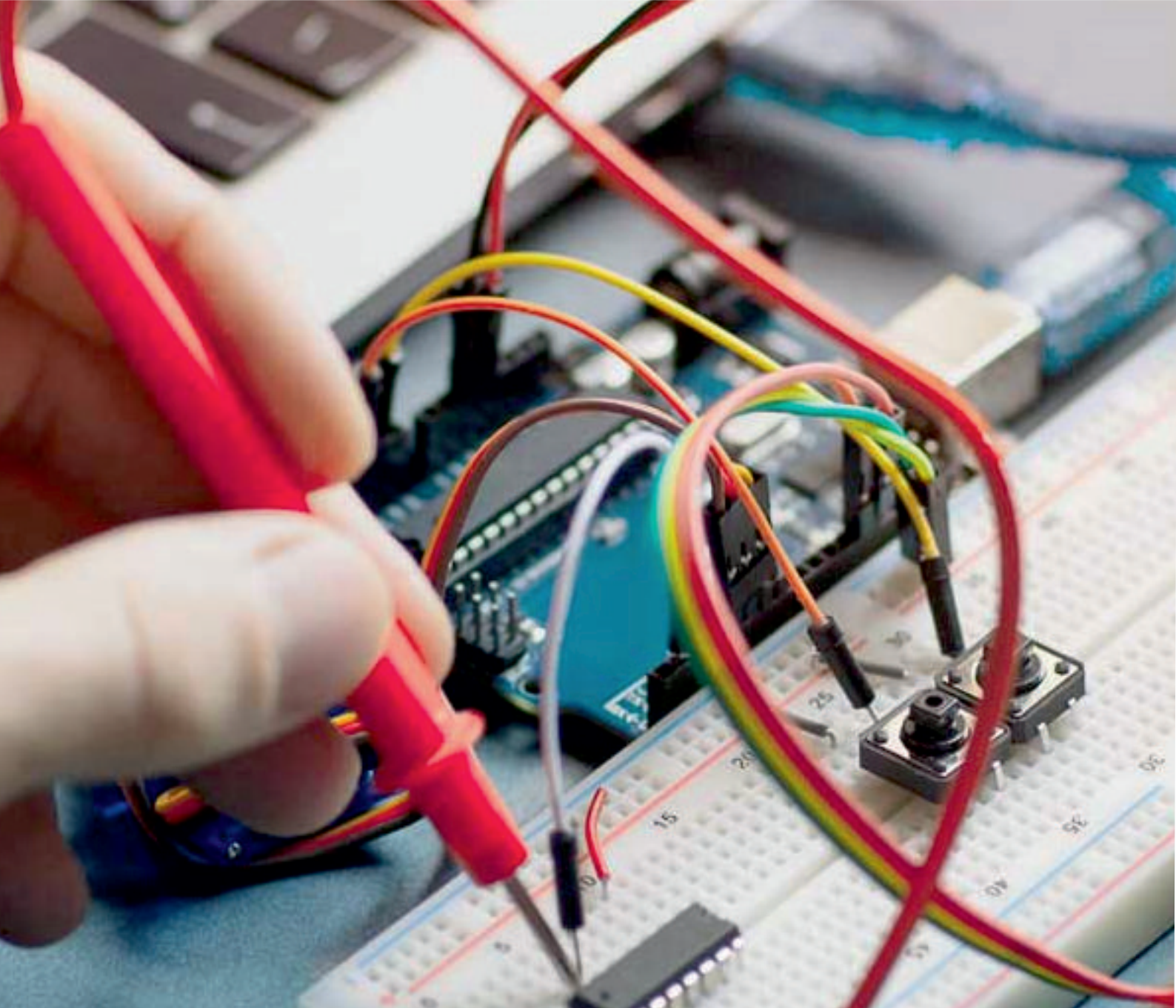
Most importantly, VR/AR developers should investigate which designs and delivery methods promote trust and usage across various age groups. For starters, they should try to be attentive to each group's interests. The contextual aspects of a serious game, such as background, authenticity, interactive features, and the storyline, may result in significant game-based learning experiences. Future research should look at if the above also applies to people over the age of 50 and VR/AR applications. When developers focus on end users as early and equitably as possible in participatory research, it aids in adoption, use, and overall tool efficacy. Therefore, participants in participatory research need to involve older people while developing digital solutions to serve their needs. It is critical to devote time to educate older people on the usage of the tool after it has been developed. Older participants may make use of support hotline and contact partner support services.

## V. CONCLUSION

In my opinion, Virtual Reality (VR) and Augmented Reality (AR) provide new and creative possibilities for older people. These tools are valuable to older people, their family, and their professional careers. While new technology may be beneficial, older people sometimes lack access to it and the technical skills needed to utilise it. To ensure that older people have digital training and assistance, it is critical that developers, practitioners, and academics recognise digital inequalities and develop older adults' training tools, services, and digital solutions that account for their varying backgrounds and needs.

## REFERENCES

- [1] Appel, L., Appel, E., Bogler, O., Wiseman, M., Cohen, L., Ein, N., et al. (2020). Older Adults with Cognitive And/or Physical Impairments Can Benefit from Immersive Virtual Reality Experiences: a Feasibility Study. *Front. Med.* 6, 329. doi:10.3389/fmed.2019.00329
- [2] D’Cunha, N. M., Nguyen, D., Naumovski, N., McKune, A. J., Kellett, J., Georgousopoulou, E. N., et al. (2019). A Mini-Review of Virtual Reality-Based Interventions to Promote Well-Being for People Living with Dementia and Mild Cognitive Impairment. *Gerontology* 65, 430–440. doi:10.1159/000500040
- [3] Dermody, G., Whitehead, L., Wilson, G., and Glass, C. (2020). The Role of Virtual Reality in Improving Health Outcomes for Community-Dwelling Older Adults: Systematic Review. *J. Med. Internet Res.* 22, e17331. doi:10.2196/17331
- [4] Gao, Z., Lee, J. E., McDonough, D. J., and Albers, C. (2020). Virtual Reality Exercise as a Coping Strategy for Health and Wellness Promotion in Older Adults during the COVID-19 Pandemic. *J. Clin. Med.* 9, 1986. doi:10.3390/jcm9061986
- [5] Lee, L. N., Kim, M. J., and Hwang, W. J. (2019). Potential of Augmented Reality and Virtual Reality Technologies to Promote Wellbeing in Older Adults. *Appl. Sci.* 9, 3556. doi:10.3390/app9173556



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