ICT4Elders

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Promoting ICT knowledge
for the elderly people

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Virtual reality study

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Content

1. Introduction

This document was created as additional activity of the ICT4Elders - Promoting ICT knowledge for the elderly people project, which is implemented in the Czech Republic, Greece, Germany, and Luxembourg with the financial support of the Erasmus+ program of the European Union. The content of this document was created as a follow-up to the need identified during analytical activities of this project. The purpose of this document is to explore the possibilities of using virtual reality in social care sector.

About the ICT4Elders project

The ICT4Elders project aims to bridge the digital divide between generations by improving the digital skills and competencies of seniors. According to Eurostat, two-fifths of people aged 65 to 74 have never used a personal computer, so through the project, we are trying to turn the rapid digital transformation into an opportunity for growth, active aging, and social inclusion of seniors.

In this context, the main goals of the ICT4Elders project are:

✓ Support the education of seniors in the field of ICT and lifelong learning.

✓ To strengthen the motivation of seniors in using the Internet and ICT applications through guided learning.

✓ To offer seniors the opportunity to grow and improve their quality of life through active aging, thus remaining active members of society.

✓ Improve the skills, knowledge, and competence of people caring for the elderly.

✓ Support active aging organizations and social service providers in providing quality services to seniors and their families.

2. Virtual and augmented reality

The past decade has seen an explosion in technological advancements in virtual and augmented reality, with hardware and software improvements playing a significant role in advancing these technologies.

The advent of low-cost VR technologies such as Oculus Rift, HTC Vive, and Sony PlayStation VR has made immersive VR experiences more accessible to the public. These technologies have enabled users to experience highly immersive digital environments that were previously only available to professionals in specialized fields.

In addition to VR, the development of Mixed Reality Interfaces (MRITF) such as Hololens has opened up new possibilities for AR. MRITF allows users to interact with digital information in the real world, enhancing the user's perception of their surroundings. These technologies have been used in various fields such as education, entertainment, and industrial applications. And everyone is still waiting for Apple to arrive on the scene, with AR glasses by Apple expected to be launched as early as 2024.

Apple has been working on a mixed reality headset that could be a game-changer for the entire AR/VR market1. The headset is expected to be like a typical VR headset, but one with a number of exterior cameras and sensors that unlock bonus functionality. Apple's development of virtual-reality content and software tools is central to creating experiences that give its future headset purpose.

Software development has also played a significant role in advancing VR and AR technology. Advances in computer vision and machine learning have enabled AR applications to recognize real-world objects and track their movements, providing users with more interactive and engaging experiences.

Furthermore, the rise of WebVR and WebAR technologies has made VR and AR experiences more accessible through web browsers. This has opened new possibilities for remote collaboration and communication, enabling users to interact with digital information from anywhere in the world.

In conclusion, the past decade has seen significant technological advancements in virtual and augmented reality, with hardware and software improvements driving innovation. As these technologies continue to advance, we can expect to see even more innovative applications in various fields such as education, healthcare, air and space, marketing, journalism, travel, real estate, skilled trades.

In education, VR and AR can be used to create immersive learning experiences that help students better understand complex concepts. In healthcare, VR has been used for years to train medical professionals and to treat patients. In marketing, AR can be used to create interactive advertisements that engage customers. In journalism, VR can be used to create immersive news stories that transport viewers to the scene of an event.

Overall, VR and AR have a wide range of applications across various fields and have the potential to revolutionize the way we interact with digital information.

What are virtual reality and augmented reality and what are the differences?

Virtual reality (VR) refers to an immersive and interactive experience that is created through computer-generated simulations. This experience can be similar to or entirely different from the physical world, allowing users to be transported to new environments and interact with digital objects and characters.

One of the most popular applications of VR is in the field of entertainment, such as video games, where players can experience a highly engaging and immersive gameplay experience. VR technology has also been utilized in the film and television industry, providing viewers with a more immersive and interactive viewing experience.

VR technology is also increasingly being used for educational purposes, including medical and military training. Medical students, for example, can use VR simulations to practice surgical procedures and gain practical experience without the need for live patients. In the military, VR simulations can help soldiers prepare for combat scenarios and other high-stress situations, without the need for expensive equipment or putting them in danger.

Another exciting application of VR is in the field of therapy. Exposure therapy, for example, is a type of therapy that exposes patients to the source of their fears or anxieties in a controlled and safe environment. VR simulations can provide a safe and immersive environment for patients to confront and overcome their fears, such as heights, flying, or public speaking. VR therapy has also shown promise in treating PTSD and other anxiety disorders.

In summary, VR is a versatile technology that can be used for a wide range of purposes, from entertainment to education and therapy. As the technology continues to improve, we can expect to see even more exciting and innovative applications of VR in the future.

Augmented Reality is a technology that superimposes computer-generated virtual objects onto the real-world environment, enhancing the user's perception of their surroundings. Unlike virtual reality, which replaces the real world with a completely virtual environment, AR adds virtual elements to the real world.

AR technology uses a combination of sensors, cameras, and software to identify the user's location and orientation, and then overlays virtual elements onto the user's view of the real world. These virtual elements can be anything from 3D objects to text, graphics, or even sound.

AR technology has a wide range of applications in various fields. In education, AR can be used to enhance learning experiences, providing interactive and immersive content that can engage students in a more meaningful way. For example, AR can be used to bring historical events to life, allowing students to experience the past in a more vivid and engaging way.

In the field of entertainment, AR is becoming increasingly popular, with apps like Pokémon Go and Snapchat utilizing AR technology to create immersive and interactive experiences for their users. AR can also be used in advertising, allowing companies to create more engaging and interactive marketing campaigns.

AR technology also has potential applications in the field of healthcare, where it can be used for medical training, simulation, and surgery. For example, AR can be used to overlay virtual medical images onto a patient's body during surgery, providing surgeons with a more accurate and precise view of the patient's anatomy.

Overall, AR technology is a powerful tool that has the potential to transform the way we interact with the world around us. As the technology continues to advance, we can expect to see even more innovative applications of AR in various fields.

So, to summarize, the main difference between virtual reality (VR) and augmented reality (AR) is that VR is a completely immersive experience that replaces the real world with a simulated one, while AR overlays digital information onto the real world.

In VR, users are completely immersed in a digital environment that replaces the real world. In contrast, AR enhances the real world by overlaying digital information onto it.

Both VR and AR are used in various fields such as education, entertainment, and advertising. They both have the potential to revolutionize the way we interact with digital information.

3. Virtual and augmented reality in social services

The field of social services can greatly benefit from the recent technological advances in virtual and augmented reality, as these technologies have the potential to transform the way social care workers interact with their clients and how clients experience the world around them.

One of the key applications of VR and AR in social services is the training of social care workers, both formal and informal. These technologies can provide a safe and controlled environment for workers to learn and practice essential skills such as communication, empathy, and problem-solving. VR simulations can also help workers to better understand the experiences of their clients, enabling them to provide more personalized and effective care.

Another important application of VR and AR in social services is in supporting clients with reduced mobility to access new experiences. VR can provide clients with immersive experiences such as traveling to various parts of the world, attending concerts, or even participating in outdoor activities, all from the comfort of their own homes. This can greatly improve the quality of life for clients with limited mobility and provide them with opportunities they may not have had otherwise.

Lastly, VR and AR can also allow any healthy individual to experience how it feels like to live with a disability, which can lead to increased empathy and understanding of the challenges faced by people with disabilities. This can help to reduce stigma and discrimination and promote more inclusive attitudes towards people with disabilities.

Another possible use that we can see mainly in industry yet coming also to the health care sector and thus long-term care sector as well is virtual reality at work safety trainings.

Training of social care workers and other care providers

The second decade of the 21st century is inherently driven by the spirit of digitization and optimization of work processes. A few years ago, an absolutely fundamental innovation appeared that meets even the strictest requirements of employers – virtual reality (VR).

Companies and their HR departments are trying to find ways and solutions in which it is worth investing resources in order to increase the effectiveness of training and development of employees. Nowadays, it is not easy to find and keep quality employees. Therefore, most companies work on the development of their existing employees and do everything to ensure that their people are satisfied at work and that their careers develop further. But what is often even more difficult is creating the right background for employee development and finding the best way to convey information so that they perceive their training and development as best as possible. A few years ago, an absolutely fundamental innovation appeared in this industry that meets even the strictest requirements of employers – virtual reality (VR).

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VR and AR training is more attractive because it provides a more immersive and interactive learning experience than traditional classroom-based training. VR and AR can simulate real-life scenarios that workers might encounter on the job, allowing them to practice their skills in a safe and controlled environment. This can help workers develop their skills and confidence more quickly than traditional training methods.

The use of VR in employee training brings countless benefits that put this technology at the forefront of ways in which training can be conducted. Among the most fundamental are, for example, the complete autonomy of training, in other words, the employee can learn and develop anywhere and at any time. Moreover, there is no need for the presence of another person, everything will be taught by a specialized VR application. Another advantage of using VR over conventional training methods is that it can ensure 100% attention of the user, who performs the actions in the training scenario quite naturally and subconsciously, thus remembering much more information. An indisputable advantage is that the VR application can monitor the user's behavior in detail, his strengths and weaknesses, according to which the training lessons can be modified, repeated, etc. Nowadays, this technology is already so advanced that it can be easily purchased and operated without of greater complexity in the form of plug & play. In the Czech Republic, there is a professional company XR Institute dealing with this topic.

In fact, VR and AR training can be particularly useful for workers with low qualifications because it provides a more engaging and interactive learning experience than traditional classroom-based training.

There are already quite a few good practice examples, so let us look at 3 of the ones that seem most promising.

Edie

Edie is a virtual reality training program developed by Dementia Australia[2] that helps care workers better understand the experiences of people with dementia. The program uses VR to simulate what it is like to have dementia, giving workers a better understanding of how to provide care for people with this condition. The program includes a range of scenarios that care workers might encounter on the job, such as dealing with challenging behavior or communicating with people with dementia. The program is designed to be immersive and interactive, allowing workers to experience what it is like to have dementia from the perspective of the person with the condition. This can help workers develop empathy and understanding for people with dementia, which can improve the quality of care they provide.

The seminar is primarily intended for caregivers - both professionals in homes for the elderly and in homes with a special regime, as well as for those who care for their loved ones at home.

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The story of the 63-year-old married couple Marci and Edie intertwines the workshop program. Their grand plans for retirement are derailed when Edie's dementia sets in, turning their lives upside down.

Through virtual reality glasses, you can become Edie for a moment and look at the world through his eyes. In the first part, you can experience what it's like to move in an environment that should be familiar to you, but in which you feel like a stranger and lose your bearings. It is the strong personal experience the participants go through that is the key to understanding people with dementia, their behavior and their reactions.

In the second part of virtual reality, Edie (and thus the participant) moves in an environment that is already adapted so that even the sick person can operate by himself and that his independence is preserved for as long as possible.

Based on the participants' own experience and under the professional guidance of the lecturer, a plan for support and care for a person with dementia is subsequently created.

Questions and answers

Here are some questions and answers about VR Edie. However, the benefits and advantages of virtual reality in education for social service workers apply to any educational program using virtual or augmented reality.

Can you briefly describe what exactly awaits them on the course?

The strongest experience on the course will undoubtedly be virtual reality for the participants. A large part of the course is based on this experience. Together with the lecturer, the participants will discuss what they experienced, how they felt, what emotions it evoked in them. At the same time, they will look together for possible solutions leading to the improvement of the married couple's situation, ways to support a person with dementia so that their independence, security and dignity are preserved for as long as possible. It is also important to support caregivers, both professionals and loved ones who take care of a person with dementia at home. The course will also cover this. The aim of the course is therefore to give the participants such knowledge that will lead to an improvement in the quality of life of a person with dementia and will also help carers to better understand the way people with dementia perceive their surroundings and thus facilitate care by, for example, knowing how to better adapt the environment.

No less important part of the course are films that complement the lecturer's lecture. In addition, each participant will also receive a whole range of materials which they will be able to use later on.

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What does the participant actually see in virtual reality?

Virtual reality is a tool that allows us to travel through space and time and become another person. For example, in game applications, you become a superhero who solves a complex task or fights against an enemy. And the virtual reality of dementia works on the same principle. You become a person who has dementia and you solve a fairly easy task for a healthy person – going to the toilet. But for a person with dementia, this task becomes a difficult task, even unsolvable: you are fighting an enemy, i.e. a disease, unfortunately there is no victory at the end.

However, every situation has a solution and the course is here to offer those solutions. Dementia cannot be cured, but we can make life easier for people with dementia. In the second part of virtual reality, participants will be able to walk through an apartment that has been modified and see that even seemingly small changes can have a very positive effect on a person with dementia.

I know you tried virtual reality yourself. What were your immediate feelings?

One such experience is often worth hundreds of words. In the past, we have already verified this at seminars with a geront suit, which can simulate the sensory and motor limitations that old age brings. Personal experience is simply the best way. Thanks to virtual reality, you get into a situation where you feel a lot of discomfort - confusion, anxiety, fear, shame, guilt - all these emotions are in one big heavy package. It simply has to be experienced. It's a big relief when you take off your glasses and get back to your life.

The Education Institute of the Czech Social Care Service Association[3] has successfully introduced this program in Europe, training 4 500 individuals over the past 4 years. With such promising results, the institute is now actively working towards expanding the program to other European countries, eager to share its benefits with an even wider audience.

Virti

Virti[4], a UK-based company, has developed a VR training platform that allows social care workers to practice their skills in a safe and controlled environment. The platform includes a range of scenarios that social care workers might encounter on the job, such as dealing with challenging behavior or administering medication. The platform uses VR to simulate real-life scenarios that social care workers might encounter on the job, helping them develop their skills and confidence in a safe environment.

Virti's platform also includes an AI-powered feedback system that provides workers with personalized feedback on their performance. This feedback can help workers identify areas where they need to improve and develop their skills more quickly.

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Embodied Labs

Another good practice example comes from the US-based company Embodied Labs. In a similar approach to the one of Dementia Australia, Embodied Labs has developed a range of VR training modules that help social care workers better understand the experiences of people with dementia. The modules use VR to simulate what it is like to have dementia, giving workers a better understanding of how to provide care for people with this condition.

The modules are designed to be immersive and interactive, allowing workers to experience what it is like to have dementia from the perspective of the person with the condition. This can help workers develop empathy and understanding for people with dementia, which can improve the quality of care they provide.

VR Care

The Educational Institution of APSS ČR invented in 2021 a unique training program using virtual reality as a training toll and enabling the training entrants to learn from new and different perspective.

The course takes participants into residential social services and focuses on the so-called 3Ps. Participants of this course will become direct actors in the provision of care in the field of serving food, ensuring hygiene and activating the elderly or a person with a disability.

The VR course includes:

- ✓ Interactive education through a modern approach in the form of virtual reality,
- ✓ a brand new interactive method of education,
- ✓ a different perspective on care in social services and in the home environment,
- ✓ Lilian Malkina (professional actor) as a client of a home for the elderly,
- ✓ an experienced team of lecturers who impress not only with their knowledge, but also with their presentation

The course is suitable for all forms and types of social services for the above-mentioned target groups, as well as for informal caregivers.

The basis of this course is an insight into everyday acts of care, but from the perspective of a person who needs support, help and care.

The aim of this course is to focus more on the needs and expectations of a social service client or a cared-for person in the home environment, through their own experience.

With the help of virtual reality glasses, the participants of this course will become direct actors in the provision of care in the field of serving food, ensuring hygiene and activating the elderly. The three different

situations that the participants will experience through unique films converted into virtual reality will make them look at them from a different point of view, especially from the point of view of the person for whom the actions are being performed. They will understand even more the needs and expectations of the person being cared for.

These above are examples which are direct applications to sector specific activities. Workers in the social service sector can of course benefit even from the more generic training uses of the technology. One way is through immersive simulations, which allow workers to practice real-world scenarios and situations in a safe and controlled environment. This is particularly useful in high-risk industries such as aviation, healthcare, and military.

AR can also be used to overlay digital information onto the real-world environment, providing workers with on-the-job training and support. For example, AR headsets can provide real-time guidance on complex procedures or instructions on how to use a piece of machinery.

VR and AR can also be used to provide remote training to workers in different locations. This can be especially useful for training geographically dispersed teams or workers in remote or inaccessible locations.

Additionally, VR and AR can create interactive training materials such as 3D models, simulations, and visualizations that are more engaging and effective than traditional training materials such as manuals or slides.

Finally, VR and AR can be used to train workers in soft skills such as communication, empathy, and leadership. For example, VR simulations can train workers in how to handle difficult customer interactions or manage a team in a high-pressure environment. Overall, VR and AR can improve worker performance, reduce training costs, and enhance safety and productivity by providing immersive, interactive, and engaging training experiences. It has the potential to revolutionize social care training by creating immersive learning experiences that help workers develop their skills and confidence in a safe environment.

Virtual reality in work safety trainings

Virtual reality is a tool widely used in work safety training in industrial segments but also in health and social care. Due to the high acceptance of VR technology among healthcare workers, it can be considered an interesting addition to conventional lectures for teaching hand hygiene. However, the hypothesis that VR teaching has a higher impact on hand rub use and hand hygiene compliance than a conventional lecture cannot be confirmed.

One example for that comes also from the Czech Rep. – from the National Work Safety Research Institution – a unique project VRsafe.

The 21st century is inextricably linked to the spirit of digitization and optimization of work processes. A few years ago, an absolutely fundamental innovation appeared in this sector, which meets even the strictest requirements of employers – virtual reality (VR). Technology that allows us to simulate any situation, without any security or financial risks. Thanks to VR technology, we are able to prepare employees for a variety of situations, whether it's crisis situations that can't be simulated in any way until they actually happen, or preparing employees for any risky actions or consistently developing the right habits that can lead to a reduction in risks in sharp operation. The use of VR in staff training brings countless benefits that put this technology at the forefront of the ways in which training can be provided.

The aim of the media campaign SAFETY AND HEALTH AT WORK IN VIRTUAL REALITY is to **increase and streamline vocational health and safety training** for workers employed in health, social and similar services **through virtual reality**.

VR reality helping care givers and nurses to relax

We all know it: the period of Covid-19 health crisis is particularly hard for doctors, nurses, nurses' aides, anesthetists and surgeons. They must deal with stressful and **exhausting working conditions**: understaffed health care teams, lack of equipment, excess patient mortality… Health care professionals invest a lot of energy and effort on a daily basis, in order to be able to take care of and manage the flow of patients as well as possible.

Even outside of a health crisis, the pressure and mental workload remain high for these healthcare professionals, whatever the medical or paramedical service concerned: pediatrics, gynecology, oncology, palliative care, outpatient surgery, emergency, anesthesia and intensive care… As a result: burnout, bad mood, and possible psychological damage for medical teams.

Some hospital groups have already integrated such relaxation tools within their department or care unit. This is for example the case of EpiCURA, located in the Mons-Borinage and Ath region in Belgium, which offers a wellness area for its nursing staff. This dedicated space, entirely focused on **physical and mental relaxation**, provides to health care staff several tools and services, such as massages and Healthy Mind virtual reality tools.

Through virtual **relaxation sessions**, virtual tools are beneficial for health care teams, as well as for the hospital establishment, because they are:

- ✓ a quick relaxation for health care staff;
- ✓ the disconnection from the work environment, thanks to a short immersion lasting between ten and twenty minutes;
- ✓ a way for the hospital group to reward its healthcare teams for their efforts and involvement;

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✓ the tool can also be used for the well-being of patients before, during or after an anxiety-provoking and/or painful medical procedure.

To achieve such results, the Healthy Mind virtual reality medical device is based on several elements:

✓ The **immersion in relaxing 3D** virtual environments.

✓ **Relaxing music**.

✓ High q**uality graphic**, ultra-realistic images. The user can also choose to escape into one of the following worlds: the "zen garden", the "forest", the "snowy mountain", the "sunny beach", or the "underwater".

✓ The medical hypnosis: verbal support, relaxation and breathing exercises.

Supporting people with reduced mobility

Social services are essential in ensuring the well-being of their clients, and mental health is a significant challenge for individuals, particularly those with reduced mobility. Although technology cannot replace the value of human interaction, it can serve as a valuable tool in improving the lives of those under the care of social services.

Virtual and augmented reality are two emerging technologies that have the potential to significantly improve mental health outcomes for clients. By providing immersive experiences that simulate real-life environments and situations, VR and AR can help clients overcome their fears and anxieties, manage stress and trauma, and enhance their overall sense of well-being.

For clients with reduced mobility, VR can be used to provide experiences such as traveling, attending events, and participating in outdoor activities that may not have been accessible otherwise. AR can also be used to enhance clients' experiences in their current environment, providing interactive and informative tours of their local community and highlighting points of interest.

It is hardly possible to list all the possible uses of this technology in such a field, let's look at some of the examples in which it is used today:

Travel

Virtual reality technology has made it possible for seniors and individuals with reduced mobility to experience new places and cultures without leaving their homes. Google Earth VR[5] is a particularly popular tool that enables users to explore the world in VR. It allows users to visit any place on Earth, including famous landmarks, cities, and natural wonders. Users can also travel to other planets and explore the solar system. The VR Museum of Fine Art[6] is another example of how VR can be used to provide people with reduced mobility with an immersive cultural experience. The museum allows users to explore famous works of art from around the world, including paintings and sculptures. The VR Gorilla[7] is yet another example of how VR can be used to enable seniors to explore the natural world. It offers VR nature documentaries that allow users to explore wildlife and natural habitats from the comfort of their own homes. By providing virtual travel experiences, VR can help people with reduced mobility to stay mentally engaged, explore new cultures, and learn about the world in a fun and immersive way.

Physical Therapy

Virtual and augmented reality technologies have shown immense potential in improving the effectiveness and efficiency of physical therapy. One area where VR and AR are proving to be beneficial is stroke rehabilitation. VR can be used to simulate reaching for objects or walking, which can help patients regain motor function. With the use of VR, patients can perform tasks that may be too difficult or dangerous in the real world, which helps them regain their confidence and independence.

In addition to stroke rehabilitation, VR and AR can also be used for pain management during medical procedures. Patients can use a VR headset to distract themselves from the pain and discomfort associated with medical procedures. This can reduce the need for pain medication, which can have unwanted side effects. With VR, patients can also learn relaxation and mindfulness techniques to manage chronic pain.

Another area where VR and AR can be used in physical therapy is balance training and fall prevention. Patients can use a VR headset to simulate walking on an uneven surface or walking on an icy surface, which can help them improve their balance and prevent falls. VR can also be used to help patients with cognitive impairments by simulating everyday tasks like grocery shopping. This can help patients improve their memory and cognitive function.

There are already several studies on the usage of virtual and augmented realities in the field of physical therapy, so we can surely expect further progress in the coming years.

Gaming to reduce risks of falls

Virtual Reality has emerged as a promising technology for improving balance and reducing the risk of falls in the elderly. Several studies have shown that VR-based interventions are more effective than conventional interventions for improving balance and reducing the fear of falling.

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One of the main advantages of VR-based interventions is that they provide a safe and controlled environment for training balance. Unlike real-world interventions, VR-based interventions allow users to practice balance tasks in a virtual environment that simulates real-world scenarios without the risk of injury. This makes it possible to design and implement interventions that are tailored to the specific needs and abilities of individual users.

Studies[8] have shown that VR-based interventions can improve both static and dynamic balance. Static balance refers to the ability to maintain the body's position while standing still, while dynamic balance refers to the ability to maintain balance while moving. VR-based interventions can provide training in both areas, which can help improve overall balance and reduce the risk of falls.

In addition to improving balance, VR-based interventions can also provide cognitive training. VR games can require users to engage in cognitive tasks such as problem-solving, decision-making, and spatial orientation, which can help improve cognitive function and reduce the risk of falls. This is particularly important for the elderly, as cognitive decline is a significant risk factor for falls.

Reducing pain

Another potential of virtual reality is in pain management. VR gaming has been shown to have significant benefits for patients suffering from chronic back pain and other types of pain. In fact, recent studies have shown that VR gaming can help reduce pain and anxiety in patients of all ages.

The study aimed to investigate the effectiveness of an 8-week virtual reality training program in elderly women suffering from chronic low back pain. The program involved three 30-minute weekly sessions of exercises using the HTC Vive virtual reality system. The study found that the intervention group experienced a significant decrease in pain intensity, reduced fall risk, and an improvement in quality of life. The results suggest that virtual reality training can be a valid therapeutic intervention for chronic low back pain in the elderly population, helping reduce symptoms and increase the effectiveness of exercises while enhancing quality of life and reducing fall risk through various movements.[9]

Another study conducted at Children's Hospital Los Angeles found that a VR game designed to manage pain and reduce anxiety was successful among a group of patients aged 10 to 21 as they underwent a blood draw. The game, which involved deep breathing and mindfulness exercises, helped reduce pain and anxiety in the patients, making the experience less traumatic for them.[10]

These studies suggest that VR gaming can be an effective and safe tool for managing pain, even chronic pain. By providing a distraction from pain and anxiety and promoting mindfulness and relaxation, VR gaming can help patients manage their pain and improve their quality of life. As VR technology continues to advance, it is likely that we will see more innovative approaches to pain management in the future.

Reducing stigmatization and increasing acceptance in the general population

Virtual reality (VR) and augmented reality (AR) technologies have the potential to create powerful and immersive experiences that can help promote empathy and understanding of the challenges faced by people with disabilities. By simulating the experience of living with a disability, VR and AR can provide individuals with a new perspective and a deeper understanding of the challenges faced by people with disabilities.

One of the most significant benefits of using VR and AR to simulate disabilities is that it allows individuals to experience firsthand the physical, cognitive, and emotional barriers that people with disabilities face. For example, a VR experience could simulate visual impairment, hearing impairment, or mobility impairment. By experiencing these impairments in a controlled environment, individuals can gain a greater appreciation for the difficulties faced by people with disabilities in their daily lives.

In addition to providing a new perspective, VR and AR simulations can also be used to educate individuals about disability issues and reduce stigma and discrimination. By increasing awareness and understanding of the challenges faced by people with disabilities, VR and AR simulations can help to promote more inclusive attitudes towards people with disabilities.

Another benefit of using VR and AR to simulate disabilities is that it can provide an opportunity for individuals to develop skills and strategies for interacting with people with disabilities. For example, a VR experience could simulate a conversation with a person who uses a communication device, allowing individuals to practice communicating effectively with people who have communication impairments.

One example of such a use is The Machine To Be Another project[11]. It is an Embodiment Virtual Reality System (EVR) that allows users to experience a body swap, called the Body Transfer Illusion. BeAnotherLab developed this system in 2012 in Barcelona to provide this unique experience to the public.

With the help of virtual reality, cognitive sciences, and performance art, TMBA lets users see and feel the world through another person's body. They can interact with others in their environment and feel realistic tactile feedback.

The Machine is the result of BeAnotherLab's long-term research on how to foster empathy and active perspective-taking. Since 2014, they have used it to address negative stereotyping and collaborated with the art, film, and scientific research communities to learn more about the human sense of embodiment.

They also work with civil rights activists in various applied contexts, including immigration, mediation, conflict resolution, care work, therapeutic body extension, and generational bonding. The Machine is a unique system with endless possibilities for promoting empathy and understanding in various contexts.

Of course, several of the methods previously mentioned in the training of social care workers can also be used with the general population, and the potential will grow as the technology becomes cheaper and more available.

4. Potential risks

Although the virtual and augmented reality technologies offer numerous potential benefits for the elderly and other social service clients, as well as their caregivers, they also carry certain potential risks, as listed below.

- ✓ Cyber sickness: Some seniors may experience symptoms of cyber sickness while using VR, including nausea, disorientation, and headaches.
- ✓ Deception: Seniors with cognitive limitations, such as dementia, may be deceived if virtual worlds are presented to them as real. This should be avoided.
- ✓ Physical injury: Seniors may be at risk of physical injury while using VR if they lose their balance or bump into objects while immersed in the virtual world. Caregivers should take precautions to ensure their safety.
- ✓ Overstimulation: Some seniors may find the immersive nature of VR overwhelming or overstimulating. Caregivers should monitor them for signs of discomfort or distress while using VR.
- ✓ Isolation: While VR can provide a means for social interaction and connection, it is important for seniors to also have regular face-to-face social interaction to prevent feelings of isolation.

Caregivers should be mindful of these potential risks and take necessary precautions to ensure the safety and wellbeing of their clients while using virtual reality technology.

5. Final thoughts

Throughout this study, we have explored various applications of virtual and augmented reality in the realm of social services, and we have only scratched the surface of what is possible. As these technologies continue to advance, their potential uses will expand even further. Additionally, as they become more affordable and widely available, they have the potential to become a more integral part of our daily lives. This is particularly exciting for individuals who have reduced mobility, as virtual and augmented reality can provide new opportunities for engagement and connection. Therefore, clients in social services have much to look forward to.

While we have focused primarily on virtual reality, augmented reality is also rapidly advancing and poised to make significant contributions in this field. With the highly anticipated entry of Apple into the augmented reality market, the pace of innovation is likely to accelerate even more. The one thing that is clear is the fact that virtual and augmented reality are here to stay and the field of social services has yet to tap into their full potential. I for one am extremely excited to explore these new horizons.

Source and links

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(3) Education institute APSS ČR - https://www.institutvzdelavani.cz/virtualni-realita-demence

(4) Virti - https://www.virti.com/

(5) Google Earth VR - https://www.google.com/earth/vr/

(6) The VR Museum of Fine Art - https://vrmfa.org/

(7) The VR Gorilla - https://www.vrgorilla.nl/

(8) VR among the elderly study - https://bmcgeriatr.biomedcentral.com/articles/10.1186/s12877-019-1218-8

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