

Virtual and immersive reality conception in adult education



Funded by
the European Union

Leading researcher - dr. Živilė Navikienė (S.A.F.E. Projects)

The picture on first page @Živilė Navikienė, 2024

Acknowledgment

This conception was carried out within the ERASMUS+ Cooperation partnerships in adult education, "Virtual and augmented reality applicability in adult education" (Project Nr. 2023-1-LT01-KA210-ADU-000157054)

Disclaimer

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the National Agency. Neither the European Union nor National Agency can be held responsible for them.

Copyright notice

© 2023 - 2025 Virtual and augmented reality applicability in adult education consortium

The license Attribution CC BY lets others distribute, remix, adapt, and build upon your work, even commercially, as long as they credit you for the original creation. This is the most accommodating of licenses offered. Recommended for maximum dissemination and use of licensed materials.



Partners



<https://safeprojects.eu>



<https://mmlsc.lt>

Contents

Introduction	4
Basic elements of VR, AR, and AI focused on adult education	6
Immersive learning environments	8
Virtual Reality (VR):	11
Augmented Reality (AR).....	13
Game -based reality	15
Artificial Intelligence (AI):	17
Virtual andragogy	19
How virtual andragogy adapts Artificial Intelligence (AI).	21
Holograms - future of adult educators.....	23
Avatar meaning in adult education.....	27
Avatars for vulnerable people	32
Visualization of Avatars	34
Literature	37

Introduction

We are at the beginning of a new era, and because technology is developing so quickly, the adult education sector is about to undergo a radical makeover. Emerging as potent instruments, virtual reality (VR), augmented reality (AR), and artificial intelligence (AI) will reshape the work of adult educators in both formal and informal learning environments.

With AI's intelligence guiding it, adult education will feature a fascinating fusion of virtual and augmented realities. In both formal and informal contexts, adult educators will be essential to maximizing the potential of new technologies as they become more widely available.

The transformative power of VR, AR, and AI promises to make learning more engaging, personalized, and globally connected, ushering in an era where the boundaries of traditional education are transcended, and the possibilities for adult learners are limitless.

"Most educators might not be aware of the features of the metaverse, not to mention the potential applications of this emerging technology," Gwo-Jen Hwang and Shu-Yun Chien (2022) remark. <..> A totally virtual environment, such as a virtual reality (VR) system, or a partially virtual world, such as the application of augmented reality (AR) in real-world situations, are examples of fully virtual and partially virtual metaverses (Avila, 2017). People can interact socially in the metaverse area by playing games, talking about issues, working together on projects, and learning from their experiences and solutions to problems (Bourlakis et al., 2009; Jovanović & Milosavljević, 2022; Park & Kim, 2022).

Furthermore, similar to the actual world, the metaverse can experience a variety of events and activities, including political, social, and natural calamities as well as economic ones (Davis et al., 2009; Díaz et al., 2020). The only thing stopping people in such a virtual world is their imagination. Furthermore, the lifelogging feature allows for a complete record of life in the metaverse (Thawonmas & Fukumoto, 2011) <..> Applications and problems related to the metaverse have received a lot of attention lately. Numerous organizations and publications have asserted that the metaverse has multiple uses. Digital games are the application that is most often discussed (Park & Kim, 2022). Healthcare is another well-known application. For instance, students can be trained in medical or nursing skills utilizing AR or VR (Huang et al., 2021; Hwang et al., 2022; Zhang et al., 2021).

Another example that has been brought up a lot in earlier metaverse articles is the use of AR or VR for military training (Díaz et al., 2020). From the standpoint of a literal definition of the metaverse, the majority of current applications are more accurately classified as AR or VR than

as the metaverse. However, the metaverse's potential is established by the efficacy and success of these applications. Naturally, consideration must be given to the features (i.e., "shared," "persistent," and "decentralized") in order to develop the best metaverse applications. To satisfy the "shared" feature, a metaverse gaming environment should, for instance, permit numerous players to play at once. Additionally, to satisfy the "persistent" characteristic, a single player may play the game continually. More importantly, the gaming environment needs to guarantee that the players can work for and own their own properties or treasures, and their logs must be safely kept using some secure technologies, such as blockchains, to fulfill the “decentralized” feature ([Vergne, 2021](#)).

Basic elements of VR, AR, and AI focused on adult education

The concept of development describes the fundamental characteristics of VR, AR, and AI in the format of adult education. artificial intelligence, virtual reality, augmented reality, and game-based reality, concerning adult education, will permit human-centered models and personalization mechanisms that will be able to control the information processing consideration and involvement of users in the presence of a large amount of such as well as to produce and deliver the fittest immersion experience for a unique user's preference.

Persuasive strategies and technology for behavior change that will alter the content and interaction process according to the users' target and activity, based on real tasks. Game-based or gamified elements, such as a scoring system, badges, timed activities, and rewards systems will foster the increase of action arousal; better emotion, and mood state in the process of completing the goals by users.

A set of artificial intelligence and interaction principles utilizing the IR technologies that can tackle the increasing complexity of data structures to access the right data at the right time, with intelligent support during exploration and analytics, thus promoting predictive and proactive actions, while at the same time diminishing cognitive load errors or runtime experience issues. The technology blends various kinds of technologies, including; artificial intelligence, virtual reality, augmented reality, and game-based reality.



Picture created <https://ideogram.ai>

This technology provides the user with a highly interactive and realistic experience by enabling them to enter a virtual reality setting that resembles real life. AI, virtual reality , and augmented reality pose unique potential for adult education.

Immersion reality systems driven by artificial intelligence (AI) allow machines to think for themselves, learn from human behavior, and contribute to the development of increasingly responsive and realistic virtual worlds. The development of chatbots, or virtual assistants, that can converse with people in a natural way is made possible by this technology.

Immersive learning environments

Virtual reality (VR) has the potential to immerse adult learners in virtual environments, offering them unique chances for hands-on learning. Imagine adult educators running hands-on simulations in a variety of professional contexts, organizing virtual field trips to historical sites, or even teaching language in virtual classrooms that imitate real-world settings. The learning process becomes more dynamic and memorable at this degree of immersion since it improves engagement and retention.

In recent years, online learning has grown in popularity and effectiveness among adult learners. Adult learners can access a wide range of educational possibilities from the comfort of their homes or workplaces with the use of digital technologies and online courses. In comparison to traditional classroom-based programs, this kind of education allows students to interact with the curriculum at their own pace and frequently at a lesser cost.



Augmented Reality (AR) blends the real and virtual worlds together by superimposing digital data on top of it. With the use of augmented reality (AR), adult educators can add interactive aspects to standard instructional resources like textbooks and presentations.

Picture created <https://ideogram.ai>

For example, sophisticated scientific models can be altered in three dimensions, historical items can come to life, and language learners can engage with virtual translations of actual objects. By incorporating AR, learning becomes more engaging and has an added layer of interactivity that improves comprehension.

Massive volumes of data about individual learning preferences, styles, and performance can be analyzed by AI systems. Using AI, adult educators can design individualized learning programs that adjust the pace and material to each learner's specific requirements. Adaptive learning systems are able to pinpoint areas in which people require more help and provide interventions and resources accordingly. This enhances the learning process and frees up teachers to concentrate on offering individualized coaching and mentoring.

VR and AR technology have the potential to enable smooth international cooperation in adult education. Through virtual classrooms, adult learners from all over the world can connect and exchange a variety of viewpoints and cultural ideas. Language barriers can be eliminated with the use of AI-driven translation technologies, creating a truly global learning community. This connection creates new opportunities for cooperative problem-solving and cross-cultural understanding.

Virtual reality (VR) has the potential to immerse adult learners in virtual environments, offering them unique chances for hands-on learning. Imagine adult educators running hands-on simulations in a variety of professional contexts, organizing virtual field trips to historical sites, or even teaching language in virtual classrooms that imitate real-world settings. The learning process becomes more dynamic and memorable at this degree of immersion since it improves engagement and retention.

Augmented Reality (AR) blends the real and virtual worlds together by superimposing digital data on top of it. With the use of augmented reality (AR), adult educators can add interactive aspects to standard instructional resources like textbooks and presentations. For example, sophisticated scientific models can be altered in three dimensions, historical items can come to life, and language learners can engage with virtual translations of actual objects. By incorporating AR, learning becomes more engaging and has an added layer of interactivity that improves comprehension. Massive volumes of data about individual learning preferences, styles, and performance can be analyzed by AI systems. Using AI, adult educators can design individualized learning programs that adjust the pace and material to each learner's specific requirements. Adaptive learning systems are able to pinpoint areas in which people require

more help and provide interventions and resources accordingly. This enhances the learning process and frees up teachers to concentrate on offering individualized coaching and mentoring.

VR and AR technology have the potential to enable smooth international cooperation in adult education. Through virtual classrooms, adult learners from all over the world can connect and exchange a variety of viewpoints and cultural ideas. Language barriers can be eliminated with the use of AI-driven translation technologies, creating a truly global learning community. This connection creates new opportunities for cooperative problem-solving and cross-cultural understanding.

VR and AR provide an element of novelty, which can help motivate adult learners to engage with and retain information better. By providing a more engaging and interactive experience than traditional learning, these technologies can significantly enhance learning outcomes. As the technology becomes more accessible and affordable, we can expect to see VR and AR gaining widespread adoption across the adult learning segment.

Adult learners can practice and refine their abilities in realistic circumstances through VR simulations. Virtual reality simulations provide a secure and controlled environment for hands-on learning, ranging from professional growth in numerous fields to interpersonal communication and leadership training. Through these simulations, adult educators can mentor learners and provide insightful coaching and feedback in a risk-free environment.

Virtual Reality (VR):

Virtual reality (VR) produces simulated, immersive environments that mimic actual events. Adult learners can participate in practical activities like employment simulations, virtual field visits, or training exercises. Adults can actively engage in simulations and manipulate items in virtual reality learning sessions. VR is a useful tool for adult education because it provides immersive experiences that improve comprehension and retention.

Head-mounted displays (HMDs) are frequently used in virtual reality (VR) to provide users with a 360-degree visual and aural experience. HMDs can be used by adult educators to create immersive learning environments that let students explore places outside of the typical classroom. Incorporation virtual reality, augmented reality elements in adult education or abilities to understand how it works will give self-confidence for adult practitioners. Adult



learners are better engaged when they work on realistic simulations and engaging scenarios with immersive reality experiences thereby upgrading motivation.

Picture

created <https://ideogram.ai>

Adults learn by actually immersing themselves in simulations of real-world situations with immersive reality which fosters skills development and experiential learning. Adult learning is more personalized with immersive reality platforms where every adult enjoys a unique learning methodology based on their preferences. Adults can practice and develop their abilities with immersive reality without concern about the consequences of any slight mistake occurring in real life. Every adult with impairment or other difficulties is more accessible to education since there are immersive reality technologies that match their learning needs and preferences.

Adult learners can practice and refine their abilities in realistic circumstances through VR simulations. Virtual reality simulations provide a secure and controlled environment for hands-on learning, ranging from professional growth in numerous fields to interpersonal communication and leadership training. Through these simulations, adult educators can mentor learners and provide insightful coaching and feedback in a risk-free environment.

To effectively assist learning, adult educators will need to be adept in the use of a wide range of educational tools. This includes cutting-edge technologies like virtual reality (VR), augmented reality (AR), and artificial intelligence (AI), in addition to more conventional tools like learning management systems (LMS) and presentation software. Engaging students and providing tailored learning experiences will require the ability to incorporate these technologies into teaching practices.

Augmented Reality (AR)

Augmented reality (AR) is one of the newest digital technologies that could improve the virtual learning environment even further. With the use of augmented reality (AR) technology, learning can become more interactive and immersive by superimposing digital content on the actual world. AR could be used, for instance, to show more information or to simulate real-world situations.

By superimposing digital data over the actual world, augmented reality (AR) improves learners' view of their surroundings. During live classes or field trips, adult educators can employ augmented reality (AR) to offer more material, interactive components, or annotations.

Since augmented reality apps are often used on mobile devices, adult learners can access and benefit from them. Adults can use mobile augmented reality (AR) for on-the-go learning to acquire more information or participate in interactive experiences relevant to their environment.



Picture created <https://ideogram.ai>

By including multimedia components or 3D models, augmented reality (AR) can improve conventional learning resources like textbooks or presentations. By utilizing AR, adult educators can create more dynamic and captivating learning resources that accommodate a variety of learning preferences.

Augmented Reality (AR) blends the real and virtual worlds together by superimposing digital data on top of it. With the use of augmented reality (AR), adult educators can add interactive aspects to standard instructional resources like textbooks and presentations. For example, sophisticated scientific models can be altered in three dimensions, historical items can come to life, and language learners can engage with virtual translations of actual objects. By incorporating AR, learning becomes more engaging and has an added layer of interactivity that improves comprehension.

Solutions for augmented and virtual reality are getting more affordable and widely available. These days, VR experiences are becoming commonplace thanks to reasonably priced VR gear and VR apps. These days, individuals may create their own AR and VR mobile apps.

Game -based reality

Gamification, or game-based reality, has become a potent technique for adult education that uses the captivating and immersive qualities of games to improve learning outcomes. Through the incorporation of game design features into educational settings, instructors can encourage student motivation, encourage active engagement, and facilitate the development of skills across a range of subjects.

The capacity of game-based reality to hold learners' attention and encourage high levels of involvement is one of the main advantages of this learning approach for adults. Teachers can create an engaging learning environment that inspires adult learners to actively participate and persevere in their learning by introducing components like competition, prizes, and challenges.

Games are naturally made to encourage the development of skills by offering chances for practice, criticism, and mastery. Game-based reality can be used in adult education to foster a



variety of abilities, such as teamwork, critical thinking, problem-solving, and decision-making. Games provide a dynamic and engaging approach to skill training through scenario-based challenges, interactive simulations, and role-playing

exercises.

Picture created <https://ideogram.ai>

Adult learners can apply theoretical knowledge and concepts to real-world circumstances in a safe and controlled environment through the use of game-based realism.

Through the use of simulated scenarios that closely resemble real-world problems, teachers can help students apply what they have learned to real-world situations. In addition to solidifying knowledge, this equips students to deal with challenging circumstances in both their personal and professional life.

Collaborative games encourage mutual support, communication skills, and peer-to-peer learning in adult education. Game-based reality offers adult learners the chance to work together and share knowledge through cooperative tasks, multiplayer simulations, and group-based quests.

Personalized learning experiences catered to each learner's unique preferences, interests, and skills are made possible by game-based reality. Teachers can modify game material, tempo, and difficulty levels to meet a range of student learning demands by utilizing adaptable gaming features. Furthermore, the ability for students to choose, explore, and get tailored feedback based on their performance encourages independence and self-directed learning.

Games offer continuous evaluation and feedback systems that let teachers keep an eye on students' development, spot problem areas, and offer help when needed. Through monitoring students' behaviors, choices, and performance in the game environment, teachers can learn a great deal about their advantages and disadvantages. Learning outcomes are eventually improved by this data-driven approach, which makes tailored feedback and targeted interventions possible.

Artificial Intelligence (AI):

AI algorithms analyze individual learning patterns, preferences, and performance to create personalized learning paths. Adult learners receive customized content, adapting to their pace and style, enhancing the effectiveness of the learning experience. AI-powered assessments can adapt to the learner's performance in real time, providing tailored feedback and identifying areas that require further attention. Adult educators can use adaptive assessments to gauge the progress of learners and tailor interventions accordingly.

AI-driven NLP allows for the development of intelligent chatbots and virtual assistants. Adult learners can benefit from AI-powered language learning tools, conversational interfaces, and real-time language translation. In the realm of adult education, combining VR, AR, and AI can create a holistic and adaptive learning environment that caters to individual needs, enhances engagement, and provides practical, real-world applications for acquired knowledge and skills.



Picture - <https://ideogram.ai>

Integrating these technologies requires thoughtful design and pedagogical considerations to ensure optimal learning outcomes for adult learners. “The applications of AI in education include personalized learning, intelligent tutoring systems, assessment automation, and teacher–student collaboration, which can help improve learning outcomes, efficiency, and global access to quality education. The scalability of AI means that its benefits can be shared by large swaths of society, providing high-quality education around the world. While AI has the capacity to make a significant positive impact on education, it is important to keep in mind the dangers of misusing AI. <...>To meet the challenges presented by the rise of technology, AI literacy and ethics education must become a part of the curricula. By leveraging these advancements, educators and policymakers can work towards creating inclusive, equitable, and effective learning environments that cater to the diverse needs of learners in the 21st century” (Kamalov F, Santandreu Calonge D, Gurrib I., 2023).

Virtual andragogy

By embracing the possibilities of virtual settings and developing technologies, virtual andragogy is changing and redefining adult education. The dynamic world of virtual education demands adult educators to create settings that empower, engage, and inspire adult learners to thrive. To do this, they must take into account the concepts of andragogy in a digital context. By adopting virtual andragogy, we open the door to a future in which adult learners utilize digital spaces to their fullest capacity in order to fulfill their goals for both their education and careers.

Micro-learning stands out as a potent and dynamic strategy that is reshaping the way people acquire new knowledge and skills in the ever-changing field of adult education. Micro-learning emerges as a disruptive force as attention spans get shorter and the need for adaptable, on-the-go learning solutions increases. Today's busy adult learners, who frequently balance work, family, and other commitments, will find this format to be ideal. Micro-learning, which might take the form of a little video, an interactive module, or a condensed essay, enables individuals



to access educational materials whenever and wherever they choose, promoting a culture of lifelong learning.

Picture

<https://ideogram.ai/>

Emerging technologies like artificial intelligence (AI), augmented reality (AR), and virtual reality (VR) easily combine with micro-learning. Imagine brief virtual reality simulations for practical skill development, augmented reality overlays giving micro-lessons a real-world context, and AI-driven personalization ensuring every micro-learning module aligns with the learner's objectives.

These combinations increase micro-learning's efficacy and make it a useful tool for adult educators. Employers can incorporate microlearning into workplace training programs to guarantee that workers have the newest skills necessary to fulfill changing job needs.

A futuristic, virtual learning environment where adults and seniors are immersed in an interactive experience. They are surrounded by holographic displays and advanced technology, with a 3D avatar instructor guiding them through a series of educational modules. The atmosphere is energizing, with bright colors and a sense of limitless possibilities.

How virtual andragogy adapts Artificial Intelligence (AI).

Adult education will become more individualized in the future, and microlearning will help with this by providing flexible learning options. Artificial Intelligence (AI) enables platforms to assess individual learning styles and preferences and provide content that is tailored to each learner's specific requirements. By using an adaptive method, adults are guaranteed to receive the most pertinent and focused material to improve their knowledge and abilities. Different learning styles are catered to by the range of multimedia forms, which include interactive exercises, films, and quizzes, making the educational process more memorable and pleasurable. In adult education, the term "virtual andragogy" describes the use of digital platforms and virtual technology to support adult learners. This involves utilizing webinars, online classes, virtual classrooms, and other technological resources that let students interact with digital information and have group learning experiences. "There are several concerns related to the deployment of AI; these include data privacy, security, bias, and teacher-student relationships, and they must be addressed to ensure the responsible and ethical implementation of AI in education". (Kamalov F, Santandreu Calonge D, Gurrib I., 2023).

Digital (virtual) andragogy constantly changing in the way of Web 1.0, Web 2.0, and Web 3.0 format making adaptations to adult learners' adequate needs and competencies. However, virtual andragogy will become more important in the future. Andragogy, as introduced by Malcolm Knowles, emphasizes self-directed learning and the importance of adults taking an active role in their education. In the virtual realm, these principles are amplified, empowering adult learners to navigate their educational journey independently. Virtual andragogy fosters a learner-centric approach, acknowledging the diverse needs, experiences, and motivations of adult learners.

Virtual andragogy capitalizes on the immersive nature of virtual environments and offers unparalleled flexibility in terms of when and where learning occurs. Adult learners can engage in realistic simulations, virtual field trips, and collaborative projects, transcending the limitations of traditional classrooms. This interactivity enhances the learning experience, allowing adults to apply knowledge in context and develop practical skills in a safe, digital space. Virtual andragogy emphasizes collaborative learning, transcending geographical barriers. Adult learners from diverse backgrounds can come together in virtual classrooms, share insights, and collaborate on projects. This collaborative approach fosters a rich exchange of ideas, experiences, and perspectives, creating a global learning community that enhances the

richness of the educational experience. Virtual andragogy leverages adaptive learning technologies powered by artificial intelligence (AI). These technologies analyze individual learning patterns, preferences, and performance, tailoring content to meet the unique needs of each adult learner. This personalization ensures that virtual learning experiences align with the specific goals and interests of the individuals, optimizing the effectiveness of the educational process, encouraging learners to navigate and critically assess the vast digital landscape, empowering them to discern credible information, adapt to evolving technologies, and contribute meaningfully in a digital society. Adults can access educational resources at their own pace, fitting learning into their busy schedules. Lifelong learning becomes a continuous journey, with adults seamlessly transitioning between formal and informal learning opportunities in the virtual realm.

Holograms - future of adult educators

Another technology that has the potential to completely change education is holograms. Three-dimensional pictures that are projected into space and observable from various perspectives are called holograms. They could be utilized to develop interactive learning environments that let students delve deeper into topics and engage in more lifelike interactions with virtual instructors or experts. Particularly noteworthy as a transforming tool, 3D holographic display boxes provide immersive and captivating learning experiences.

The incorporation of technology has resulted in a notable alteration of education. Teachers have embraced a variety of methods to accommodate different learning styles and preferences, from traditional classrooms to online learning environments. But the development of 3D holographic display technology, which blurs the boundaries between virtual and actual worlds, is a major step ahead.

Without the use of special glasses or headsets, a 3D holographic display box uses holography to create three-dimensional pictures that seem to float in space. These displays provide viewers a sense of immersion and interaction by projecting images with depth and perspective. Teachers can use this technology to present dynamic and interesting content in adult education settings by utilizing cutting-edge strategies.



Picture created <https://ideogram.ai>

The capacity of 3D holographic display boxes to hold students' interest and encourage deeper participation is one of its main benefits. Holographic displays can be utilized in interactive courses, simulations, or presentations to create a multisensory learning environment that encourages engagement and curiosity. Clear visualizations of complex concepts help learners better understand abstract concepts.

3D holographic display boxes are ideal for a variety of educational applications due to their adaptability. Learners can investigate complex mechanical systems, architectural plans, and anatomical structures in three dimensions in domains including engineering, medicine, and architecture. Virtual labs allow for practical experimentation without requiring real equipment, while immersive reenactments can bring historical events to life. The ability to customize and collaborate with 3D holographic display technology is another intriguing feature. By customizing information to adult learners' unique needs and interests, educators can create individualized learning experiences. Additionally, real-time student interaction across geographical boundaries is made possible via remote collaboration technologies, which promote community building and group learning.

Even though 3D holographic display boxes have many advantages for adult education, some issues need to be resolved before they can be used effectively. These could include restrictions on technology, financial constraints, and the requirement for sufficient support and training for teachers. Furthermore, it is still crucial to guarantee inclusion and accessibility for all students while using new technology.

With further advancements in technology, 3D holographic displays have the potential to completely transform adult education. The future of immersive learning environments is full of fascinating possibilities, ranging from interactive storytelling experiences to virtual field trips. By keeping up with technical advancements and embracing creativity, educators may fully utilize holographic displays to empower students and enhance learning environments.

The introduction of 3D holographic display boxes into adult education marks a paradigm change in the digital age. These cutting-edge tools can completely change the way that knowledge is communicated and comprehended by providing immersive and interactive learning experiences. By embracing the possibilities of holographic technology, educators are laying the groundwork for an endlessly curious future.

Holographic display boxes provide an answer by giving students a tactile depiction of these ideas in three dimensions, which improves learning. Holographic displays make abstract

concepts more approachable and interesting, whether one is studying the structure of molecules in chemistry, examining anatomical features in biology, or evaluating data in statistics.

The potential of holographic display boxes to produce interactive educational experiences is one of its main advantages. Adult learners have real-time interaction with multimedia content, virtual world exploration, and holographic object manipulation capabilities. With this practical approach, students are empowered to take charge of their own learning and are encouraged to participate actively. Holographic displays encourage deeper engagement and knowledge retention among adult learners by promoting interactivity.

Adult educators can model real-world situations and practical applications of theoretical concepts with the help of holographic display boxes. For instance, adult learners can participate in simulated work environments in professional development courses. Here, they can put their problem-solving abilities to use, cooperate virtually with peers, and make judgments based on plausible circumstances. These simulations offer invaluable possibilities for hands-on learning that close the gap between theory and reality.

By enabling numerous learners to interact with the same holographic content at once, regardless of where they are physically located, holographic display boxes promote collaborative learning. Adult learners can participate in peer feedback sessions, group projects, and conversations via



virtual
collaboration
technologies,
which promotes
community
building and
group learning.

Picture

<https://www.youtube.com/watch?v=xZrw6JUzS50>

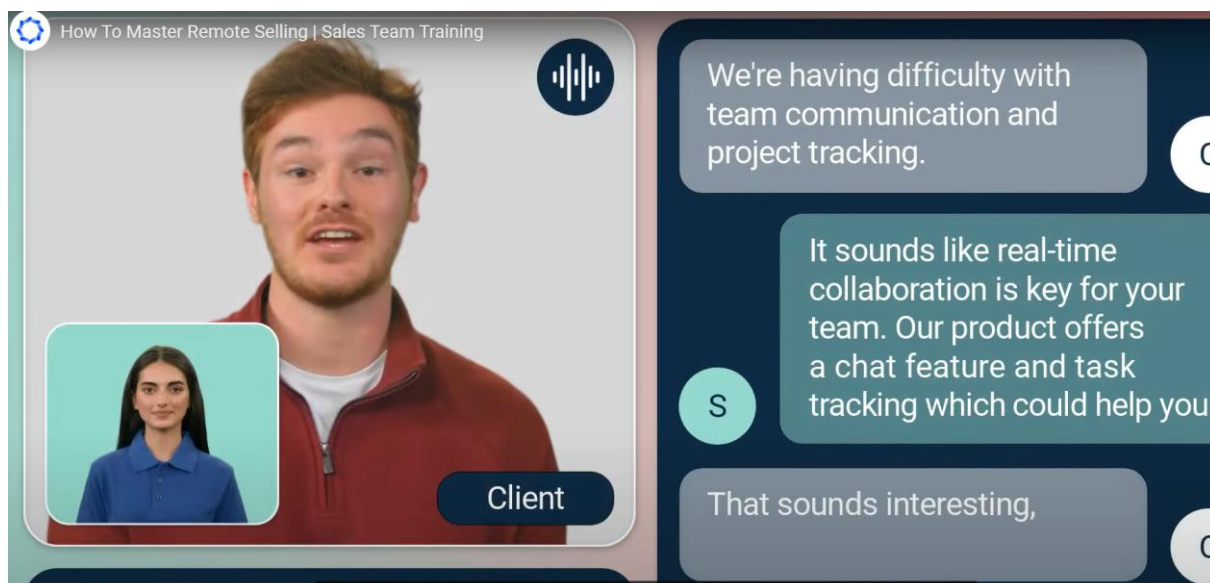
Holographic display boxes provide chances for individualized learning experiences. Holographic displays allow instructors to effectively meet the different needs of adult learners by allowing them to adapt learning routes based on student progress, provide interactive quizzes and evaluations, and modify the complexity of holographic simulations.

Holographic display boxes promote experimentation and exploration, which stimulates creativity and innovation in adult learning settings. In a risk-free virtual environment, learners are encouraged to exercise critical thinking, solve problems imaginatively, and consider alternate answers. This encourages an innovative culture where adult learners are encouraged to question norms, think creatively, and explore novel concepts and opportunities.

Avatar meaning in adult education

Avatars, which are mostly found on chat and entertainment websites, are computer representations of users in a 3D environment becoming more popular in commercial uses include sales, customer service, and training. Avatars on a company website might help prospective clients by providing text or audio connections. Avatars can help to replace adult educator, teacher who is able all the time to present the same recorded thing.

Palczna M. (2020) analyze reveals that “the avatar – a virtual representation of the player. For online education to bring the expected results, it is important for users to choose the right avatar.” <...> Due to the availability and attractiveness of electronic devices, they are used more and more frequently in educational practice (Virvou, Katsionis and Manos, 2005; Moore, Dickson-Deane and Galyen, 2011; Durkin, Boyle, Hunter and Conti-Ramsden, 2015). Many device-based activities require the creation of a virtual user representation – an avatar (Meadows, 2007). Klevjer (2007) defines it as a substitute body that allows the player to be present in the fictional world. However, a player’s representation does not have to be just a human image. It can be an animal, machine, or anything else (Waggoner, 2009). The use of avatars in education has the advantage that they are fun and are always available, therefore engagement is increased (Oestreicher, Kuzma and Yen, 2010). Furthermore, avatars’ characteristics can affect learning outcomes. For example, Chen et al., (2012) show that empathic avatars increase learners’ willingness to continue reading and complete exercises”.



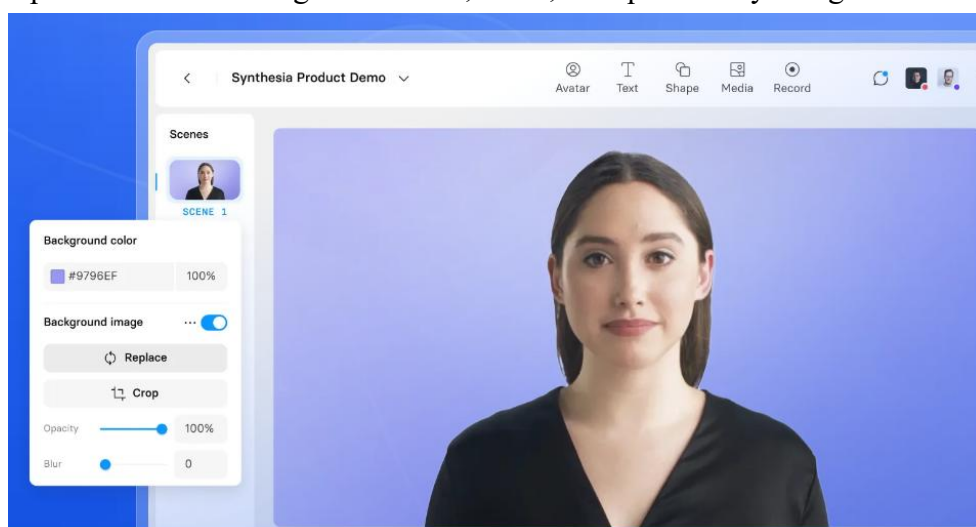
Picture <https://www.synthesia.io/>

Each learner and adult educator can create their own avatar. Already some social media networks as Meta use personal avatars. Kim (2014) revealed that participants who create personalized avatars experience less stress and aggressive thoughts, more enjoyment, and a stronger presence in the game, and at the same time show less aggressive and more pro-social behavior than participants who cannot customize their representation.

By providing a means of escape from the limitations and stresses of the real world, avatars enable people to investigate other identities, realities, and experiences. This escape can lead to a more pleasurable and fulfilling experience in virtual worlds by relieving tension, anxiety, or insecurities connected with real-life encounters.

Avatars are frequently idealized depictions of people, devoid of flaws, physical constraints, or social stigmas. People can exhibit their greatest traits, skills, and qualities by using avatars to represent themselves.

This helps people feel confident and satisfied with their online identity.



Picture <https://www.synthesia.io/>

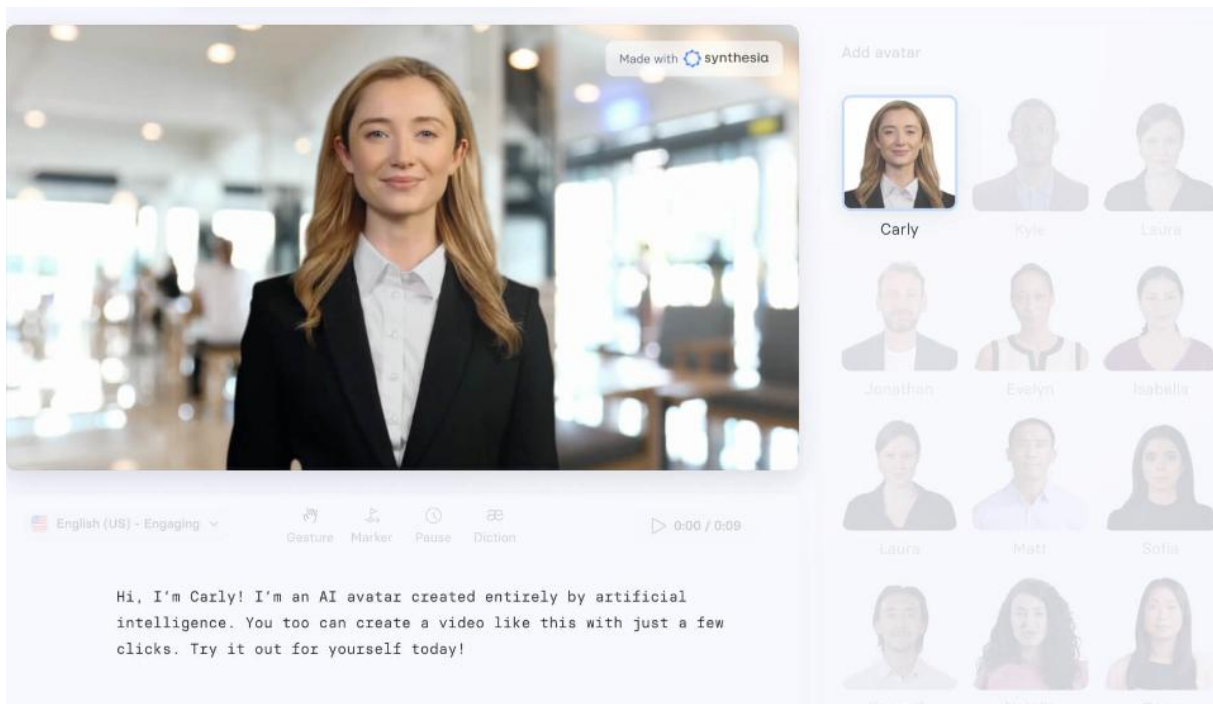
In virtual worlds, having control over an avatar gives people a sense of agency and autonomy over their online persona and communications. In contrast to real-life scenarios where people could feel confined by societal conventions or anticipations, engaging via avatars grants more autonomy and control over one's self-presentation, resulting in happier virtual experiences.

Anne M. Blake, James L. Moseley (2014) “Avatars are gaining popularity as an emerging technology to facilitate learning and instruction. Avatars can be used as agents of e-learning applications or as part of immersive learning environments such as Second Life. Research indicates that avatar use has numerous potential benefits, including increased student engagement and opportunities for quality interaction among online participants. Educators

should consider effective design principles and criteria when deciding to include avatars in course design and development.”

Getting compliments and affirmation from others in virtual settings might make using avatars to present more enjoyable. A sense of fulfillment and reinforcement of one's avatar presentation is derived from affirming experiences, which can include comments on appearance, achievements in virtual activities, or social interactions with peers.

With the wide range of customization choices that avatars provide, people can express their individuality and preferences through the customization of their appearance, attire, accessories, and even personality traits. People can construct avatars that reflect their idealized or aspirational self-image thanks to this degree of personalization, which empowers them through self-expression and gives them a sense of fulfillment. In studies by Dunn and Guadagno (2012), more attractive avatars were chosen by introverted men and women and neurotic women. Lin and Wang (2014) did not find a relationship between an avatar and a player's personality. Sometimes players adapt to the roles expected of their avatars, regardless of who they are in the social world (Yee, Ducheneaut, Yao and Nelson, 2011).



Picture <https://www.synthesia.io/>

There are significant concerns around accountability, ethics, and the ramifications of virtual interactions when imitation and responsibility are ascribed to avatars rather than the people in control of them. Avatars can behave as virtual versions of people in virtual spaces, but it's

important to understand that the choices and acts that avatars make are ultimately up to the people who govern them. People can communicate with people in virtual places by using their avatars, which typically act as extensions of their online identities. Sometimes people project parts of themselves onto their avatars, which affects how those avatars act and communicate with other people. Avatars' actions could therefore be interpreted as reflections of the people who control them, obfuscating the distinction between virtual and actual identities.

Even though users still have agency and authority over their avatars, avatars may behave in ways that are inconsistent with the goals or ideals of their controllers. A number of reasons, including social influence, anonymity, and the immersive quality of virtual environments, may contribute to this. In certain situations, people could have a sense of dissociation or detachment from the conduct of their avatars, making it difficult to assign blame.

Löllgen, Berger-Estilita, Rössler, Mileder. (2022) explains that “based on the results of this pilot study, avatar and distance simulation can be employed successfully and appear to be good supplements to face-to-face simulation. Other studies are warranted to further explore the effectiveness of various types of virtual simulation compared to conventional presential simulation. We suggest using avatar-based simulation for targeted communication and leadership skills training and the application of distance simulation to bring simulation experts virtually to remote places where educator resources are lacking”.

Avatars that replicate immoral or damaging actions give rise to moral questions about accountability and responsibility. Avatar-perpetrated acts of discrimination, harassment, or cyberbullying can have real-world repercussions for victims as well as communities. Bryant C. Mitchell, Dandeson Panda (2013) says that “avatars play a critical role in most social networks acting as virtual agents that facilitate human communications.” The ethical ramifications of virtual contacts and people's obligations to regulate the behavior of their avatars must be carefully considered to resolve these concerns.

Legal frameworks and rules governing online conduct and accountability are becoming more and more necessary as virtual environments become more integrated into social, educational, and professional sectors. While some online behaviors may be covered by current laws, resolving concerns about avatar liability and replication calls for sophisticated strategies that take into account the special features of virtual interactions.

When using avatars for therapeutic or educational purposes, it may be required to implement interventions that encourage moral behavior and responsible behavior. Developing digital citizenship abilities, encouraging empathy and respect, and dealing with instances of

inappropriate behavior in virtual spaces are all tasks that educators, counselors, and practitioners may help with. Avatars are virtual representations that people manage, yet there are complicated ethical, legal, and social issues raised by the replication and accountability of their acts. Recognizing the connection between virtual and real-world identities and encouraging responsible behavior and ethical conduct in online environments are crucial as virtual interactions become more commonplace. We may endeavor to promote inclusive, courteous, and responsible virtual communities by tackling these issues.

Falloon, G.. (2010) emphasizes that ” relating to advantages from gaming and avatar use, ranging from enhanced engagement in learning activities, through to more purposeful and focussed communication, and, when used in group situations, better cooperation and collaboration between students. It explores the potential of avatar environments to act as powerful communication mediums for students to display knowledge and understanding, and engage in the development of ‘higher order thinking skills, such as interpreting, analyzing, evaluating, synthesizing and solving complex problems’.

Avatars for vulnerable people

Avatars are a potentially useful tool for supporting learning in vulnerable groups, such as people with special needs, mental health issues, or impairments. Avatars can provide a safe, encouraging learning environment by offering an interactive, customizable virtual representation. They can also cater to the specific needs and preferences of vulnerable learners. Learning can be made more inclusive for vulnerable populations by customizing avatars to meet a variety of accessibility requirements. Avatars can be used by people with physical disabilities as a virtual representation that gets around physical restrictions and lets them participate in educational activities without any obstacles. Avatars can also help students who have visual or aural impairments by offering text-based or sign-language interactions as alternate forms of communication.

Vulnerable learners can express themselves in ways that might be difficult or impossible in real-world situations thanks to avatars. By personalizing their avatar's look, traits, and capabilities, students can design a virtual persona that accurately represents their interests and identities. Learners' motivation, self-worth, and confidence can all be increased by having this sense of agency and self-expression, which motivates them to actively engage in the learning process.



Picture created <https://ideogram.ai>

Avatars can provide vulnerable learners with emotional support and engagement, especially if they are dealing with mental health issues or social anxiety. Avatars provide learners with a safe and encouraging atmosphere where they feel comfortable expressing themselves and trying out new concepts through sympathetic interactions and constructive criticism.

Avatars can also offer support, compliments, and positive reinforcement, which helps to create a feeling of community and inspires learning. Avatars can operate as go-betweens for vulnerable populations that might find it difficult to practice and build social interaction and communication skills in a safe setting. Learners can engage with avatars and other virtual characters through social simulations, cooperative exercises, and virtual role-playing scenarios. This helps them hone their interpersonal skills and gain confidence in social settings.

Personalized learning experiences that are catered to the unique requirements, passions, and inclinations of sensitive learners are made possible by avatars. Avatars can offer personalized support and scaffolding to promote learning by adjusting the content, pace, and degree of difficulty according to each learner's unique profile. Avatars can also provide learners with tailored advice, recommendations, and feedback, enabling them to make better educational decisions.

Because they reflect a variety of identities, cultures, and experiences, avatars can encourage cultural sensitivity and diversity. Seeing yourself reflected in avatars can improve sentiments of inclusiveness, validation, and representation for vulnerable groups from marginalized or underrepresented cultures. Additionally, by exposing students to a variety of viewpoints and experiences, avatars can promote empathy and cross-cultural understanding.

Visualization of Avatars

The process of visualizing digital personalities or characters inside virtual worlds is known as avatar visualization. Users can engage with others and navigate virtual places using their avatars, which operate as their online identities.

An intriguing picture of grown-ups training to become avatars in a futuristic facility. Every person is linked to a holographic interface that shows their avatars in a lifelike three-dimensional setting. The air in the room is a mix of concentration and excitement, and it is full of cutting-edge equipment. The grownups are prepared to dive into this cutting-edge learning experience; they are dressed in a casual yet polished manner.



Picture created <https://ideogram.ai>



Picture created <https://ideogram.ai>

Picture of grown-ups training to become avatars in a futuristic facility. Every person is linked to a holographic interface that shows their avatars in a lifelike three-dimensional setting. The air in the room is a mix of concentration and excitement, and it is full of cutting-edge equipment. The grownups are prepared to dive into this cutting-edge learning experience; they are dressed in a casual yet polished manner.



Picture created <https://ideogram.ai>

An intriguing scene in a futuristic facility where adults are being trained to be avatars. They may be seen losing themselves in a virtual reality environment while donning virtual reality headsets. Every person is involved in a distinct experience where their hands interact with holographic images. A sense of awe permeates the surroundings, which combine cutting-edge technology and organic components with a calming color scheme.

Literature

1. Anne M. Blake, James L. Moseley The Emerging Technology of Avatars: Some Educational Considerations. *Educational Technology*. Vol. 50, No. 2 (March-April 2010), pp. 13-20 (8 pages) Published By: Educational Technology Publications, Inc.
2. Artificial intelligence must be grounded in human rights -
Artificial intelligence must be grounded in human rights, says High Commissioner | OHCHR
3. Bryant C. Mitchell, Dandeson Panda, Muna Elobaid, Nicole A. Buzzetton AVATARS IN EDUCATION AND THE WORKPLACE//Review of Business Technology Research. (2013). pages 440-450
4. Falloon, G.. (2010). Using avatars and virtual environments in learning: What do they have to offer?. *British Journal of Educational Technology*. 41. 10.1111/j.1467-8535.2009.00991.x.
5. Gwo-Jen Hwang, Shu-Yun Chien, Definition, roles, and potential research issues of the metaverse in education: An artificial intelligence perspective, *Computers and Education: Artificial Intelligence*, Volume 3, 2022, 100082,
https://ruj.uj.edu.pl/xmlui/bitstream/handle/item/267531/paleczna_szmigielska_avatars_in_education_age_differences_in_avatar_customization_2020.pdf?sequence=1&isAllowed=y
6. Hwang, G.J.; Chien, S.Y. Definition, roles, and potential research issues of the metaverse in education: An artificial intelligence perspective. *Comput. Educ. Artif. Intell.* **2022**, *3*, 100082. [[Google Scholar](#)] ISSN 2666-920X, <https://doi.org/10.1016/j.caeai.2022.100082>.
7. Kamalov F, Santandreu Calonge D, Gurrib I. New Era of Artificial Intelligence in Education: Towards a Sustainable Multifaceted Revolution. *Sustainability*. 2023; 15(16):12451. <https://doi.org/10.3390/su151612451>
8. Löllgen, Berger-Estilita, Rössler, Miledler. Avatar and distance simulation as a learning tool – virtual simulation technology as a facilitator or barrier? A questionnaire-based study on behalf of Netzwerk Kindersimulation e.V. *Front Pediatr.* 2022; 10: 853243. Published online 2022 Oct 26. doi: [10.3389/fped.2022.853243](https://doi.org/10.3389/fped.2022.853243)

9. OECD (2022), "Rights in the digital age: Challenges and ways forward", *OECD Digital Economy Papers*, No. 347, OECD Publishing, Paris, <https://doi.org/10.1787/deb707a8-en>. Rights in the Digital Age: Challenges and Ways Forward (oecd-ilibrary.org)
10. Paleczna M. Avatars in Education: Age Differences in Avatar Customization. *Psychology and Education*. (2020) 57(3): 203-205
11. Schiff, D. Education for AI, not AI for Education: The role of education and ethics in national AI policy strategies. *Int. J. Artif. Intell. Educ.* **2022**, 32, 527–563. [**Google Scholar**]
12. Sdravopoulou K, Muñoz González JM, Hidalgo-Ariza MD. Educating Adults with a Location-Based Augmented Reality Game: A Content Analysis Approach. *Mathematics*. 2021; 9(17):2071. <https://doi.org/10.3390/math9172071>