



DISABILITY

BEYOND BARRIERS

Embracing Diversity Through Technology

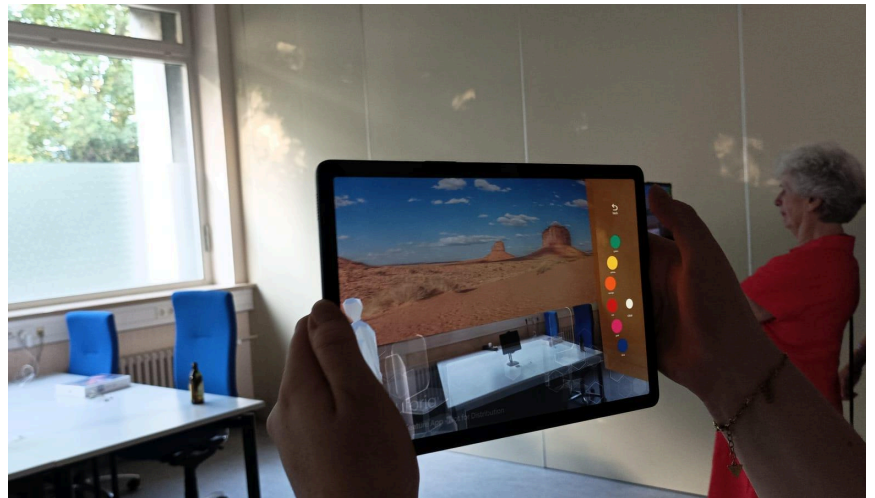
Group 5 - Fun-f

20.04. 2023 - 14.07.202

Kiana Samiee Moghadam, Johann Pauli, Chanda Gauranga, Gian Dubberke, Kristina Koseva

1 in every 8 people in the world lives with a mental disorder [4]. They are affected by inaccessibility from both a civil right and business perspective. They experience stigma and exclusion most of the time. This thought-provoking fact inspired us that in our immersive experience and make a room in which our audience can experience a future classroom in year 2045 which adapts to their preferences in both in physical space and learning methods.

[A1] Link: <https://vimeo.com/849184740>



Contents

Contents	2
Abstract	4
Project brief	5
EUt+	5
Solarpunk	5
A Day in The Life of a Student in 2045	5
Research	6
Concept	7
First prototype	7
Interview insights	8
Final Concept	9
Experience Goals	10
Overcoming Disabilities and Normalizing Accessibility	10
Personalized Learning Journey	10
Global Collaboration and Connection	10
Enhanced Focus and Immersive Environment	10
Empathy and Understanding	10
Production	11
Physical interaction	11
Displayed Content	11
Music Video Development	12
Implementation	12
Digital interaction	13
Why AR	13
Unity & Vuforia	13
Feasibility Test	13
Advancing Development	14
Modes	15
Wall Color	15
Window Scenery	16
Presentation	17
Sound	18
Reality fade	19
UI & UX Design	20
Social Media	21
Event day	22
Layout	22
Introduction	23

AR-Part	24
Opening Statement & Device Distribution	24
Learnings and impressions	25
Practical part	26
Certificate	29
Feedback	30
Conclusion	31
Project Achievements	31
Group Learnings	31
Personal learnings	31
Gian:	31
Johann:	31
Kiana:	32
Chanda:	32
Kristina:	32
Team Responsibilities	32
Sources	33
Appendix	33

Abstract

In a world where a huge number of people live with a mental or physical barrier and face stigma and exclusion, we envision a future where there is no room for being excluded. At the core of the experience is the belief in accessibility and personalization. Advanced technologies are harnessed to create a learning journey tailored to each student's unique needs and strengths, offering a future where disabilities are normalized through cutting-edge assistive technologies. Geographical constraints are overcome through virtual platforms and holographic displays, fostering global collaboration and a vibrant learning community.

We started with digging EUt+ values and imagining a future which is aligned with the solarpunk concept. These to lead us to GSDG. Beyond the concept, to design a scene of the year 2045, we also utilize the concept of diminished reality and benchmark the developments of cutting-edge technology.

Our immersive experience seeks to address this issue by creating a futuristic learning space that adapts to students' preferences in physical space and learning methods. Embracing diversity and accessibility as core principles, the adaptive learning space leverages transformative tech solutions to eliminate barriers and empower learners.

Project brief

EUt+

The project was created in consideration of EUt+. EUt+ has certain principles that we wanted to represent in our experience. We identified the core pillars that later served as guidance for our goals and connection. The core pillars are "Think Human First", which describes the human-centered conception of technology. The technology we create is focused on simplifying and improving aspects of human life. In our case we focus on enhancing education through technology and improving learning experiences with adaptive learning spaces. Utilizing technology to create a responsible future and use communication and exchange to grow together as one. We support the value and idea of collaboration that strengthens each partner university. One of EUt+ mission statements is "Technology is first and foremost human: It is our essential human ability to express, think and understand the world through artifacts" [1].



Solarpunk

Solarpunk is a genre of speculative fiction that envisions a positive future where renewable energy and sustainable technologies have transformed society. It promotes ecological balance, emphasizing harmony between humans, nature, and technology. Themes include community, resilience, and hope, inspiring real-world solutions for a greener world. Solarpunk serves as a powerful catalyst for inspiring real-world solutions and fostering a collective vision of a thriving and sustainable civilization.

A Day in The Life of a Student in 2045

On the 14th of July, 2023, the media campus of H_Da hosted a "Future Festival" and was a portal to the year 2045. A year where society has embraced solarpunk and education is decentralized owing to the trailblazing efforts of EUt+.

Visitors could experience campus life in the year 2045 by entering any of the 5 rooms that focused on a specific aspect - Future Learning Spaces, International Collaboration, Nature & Humans, Leisure & Living, Mindfulness.

Research

After debriefing our client's request, we find out about their vision and mission which is technological education that empowers citizens and impacts society to build a powerful Europe of the century. Diving deep to these visions we found a connection between them and SDGG that lies in the promotion of inclusivity, diversity, and sustainable communities. Among the 17 goals we came up with 5 of them regarding Sustainable Cities & Communities, reduce inequity, gender equality, partnership for the goals, and equal education.

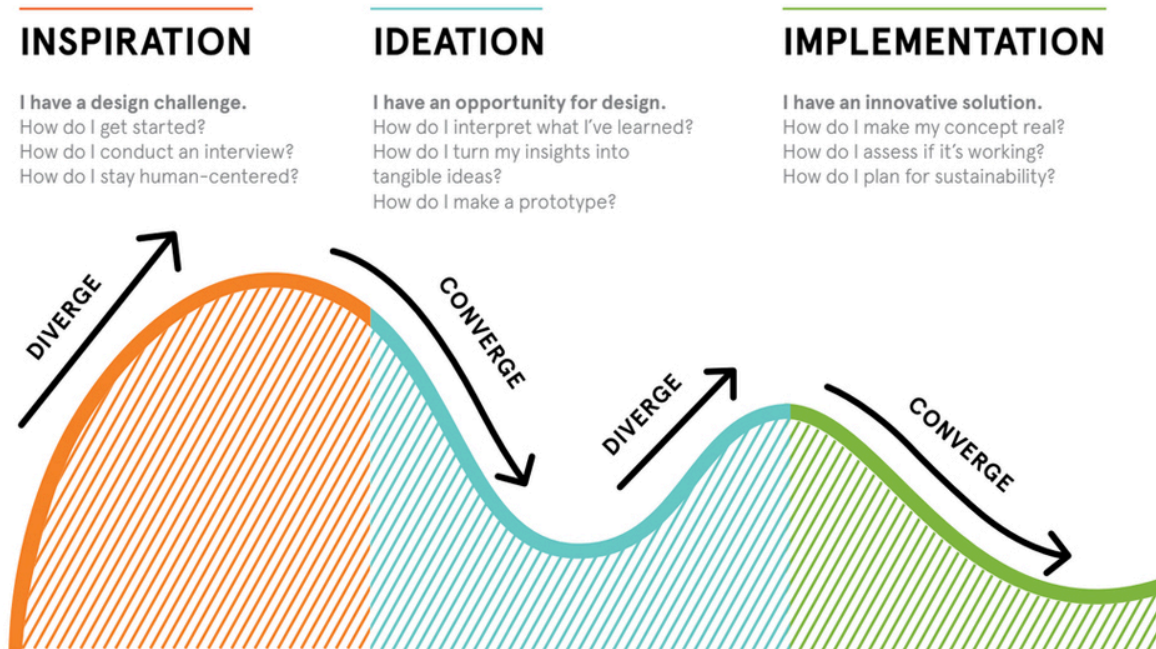
We emphasize providing people with a diverse space where knowledge is shared with all individuals, regardless of their background or feelings of exclusion. By offering equal opportunities for participation in problem-solving communities, this aligns with the Sustainable Development Goal, which aims to reduce inequalities within and among countries. Embracing diversity and inclusivity in problem-solving initiatives helps ensure that everyone's voices and perspectives are heard and valued.

The idea of creating a diverse and sustainable society reflects the objectives, which focuses on building inclusive, safe, resilient, and sustainable cities and communities. Embracing diversity in problem-solving efforts can lead to innovative and sustainable solutions that address the unique challenges faced by different communities around the world.

"Connecting the dots", which emphasizes the importance of global partnerships and cooperation to achieve the Sustainable Development Goals. Embracing diversity in problem-solving fosters a collaborative environment where people from different backgrounds and expertise can come together to address complex global challenges. By promoting inclusivity, diversity, and sustainable problem-solving, our experience aligns with several Sustainable Global Goals, contributing to a more equitable, resilient, and interconnected world. These goals are essential for creating a future where everyone has equal opportunities and access to sustainable development, progress, and knowledge.

Concept

Our Concept creation process followed the design thinking methods (see [Img.1](#)) of creating divergent ideas to find creative approaches, followed up by a converging phase to narrow down the concept. This process was repeated multiple times to come closer to our final Concept.



Img. 1 Example from Design Kit: The Course for Human-Centered Design, by IDEO.org + Acumen Fund

First prototype

After narrowing down our creative approaches we created our very first rough prototype. Our idea back then was focusing on showcasing a future in which classroom-related difficulties and disabilities are accounted for and the classroom is now as accessible to everyone, as it always should have been. And all that thanks to the integrated assistive and informational technology we would have provided.

In the first half of the classroom, we had 4 immersive and educational stations, each focusing on a different difficulty (see [Img.2](#)):

- one for vision, which tackled color blindness, partial or complete blindness;
- one for hearing, which tackled hearing loss and different types of sound sensitivity;
- one for motor difficulties, which focused on muscle control, movement and mobility;
- and one for cognitive, which focused on ADHD;

In the second half of the classroom, we created a highly immersive feedback station, where with the help of augmentation, the visitors would directly create their perfect classroom environment and set their learning type preferences, instead of just writing it on a whiteboard or answering a questionnaire (see [Img.3](#)).



Img. 2 Initial first person view, showcasing the first half of the experience - the 4 Learning Stations.



Img. 3 First person view, entering the second part of the experience - the AR Task Area.

Interview insights

With the help of our digital room walkthrough, we tested our concept with 12+ participants including multiple extreme users (affected by disabilities or difficulties). The core results from these qualitative interviews are shown in the following (see [Img 4](#)).

Positive Points	Negative Points
• Poke their thoughts by experiencing the difficulties • cheerful that we are tackling the topic and increasing awareness • <u>positive impact of such an idea</u> (permanent class in 2045) • mentioned “increasing awareness” and “learning about disabilities”	• Unclear instruction/task in the room • Range of disabilities is not broad enough • Long and hard to grasp all parts of the concept

Img. 4 Our summarized positive and negative findings from the concept interviews.

Final Concept

Our client, EUt+, provides people a diverse space in which knowledge is shared with all people. No matter how you feel you are excluded from society, everyone has the equal opportunity to participate in communities for solving problems. We embrace diversity to solve problems and make a diverse and sustainable society. We believe that new ideas come up when we “connect the dots”. These values lead us to an adaptive learning space.

At the core of the adaptive learning space is the belief in accessibility and personalization. Each student's unique needs and preferences, utilizing advanced technologies and personalized features to elevate the learning experience and eliminate disabilities through transformative tech solutions.

To eliminate any barriers in the learning spaces, the adaptive learning space harnesses cutting-edge assistive technologies. Visually impaired learners can embrace augmented reality (AR) glasses or retinal implants that translate visual data into auditory or tactile feedback, enabling them to perceive their surroundings and access learning materials in a manner tailored to their individual needs.

The adaptive learning space transcends physical boundaries, fostering collaboration and communication beyond geographical constraints. Virtual platforms facilitate seamless connections among students and educators from across Europe, utilizing holographic displays to create virtual classrooms, group discussions, and collaborative projects, fostering a vibrant global learning community in collaboration with Eut+ partners.

Recognizing the profound impact of the learning environment on student focus and engagement, the space allows for environmental customization. From lighting to background sounds and overall aesthetics, students can tailor their surroundings to create an optimal learning atmosphere, minimizing distractions and promoting an immersive learning experience.

Ultimately, the adaptive learning space of 2045 is a visionary realm where technology and compassion intertwine to create an educational journey of empowerment and growth. By embracing the principles of accessibility, personalization, and inclusivity, this transformative learning environment paves the way for a generation of students to overcome disabilities, embrace their unique abilities, and flourish as lifelong learners in an interconnected world.

DISCLAIMER: The above is only a proof of concept and is to be taken only as the team's vision of the future and not as scientifically accurate. Everything shown should be subject to further research.

Experience Goals

Overcoming Disabilities and Normalizing Accessibility

One of the core aspirations of the adaptive learning space is to overcome disabilities through technology. We believe in a future in which by equipping the space with advanced assistive technologies, such as AR glasses and retinal implants, the goal is to break down barriers for students with physical or mental disabilities, fostering an environment where everyone can access and thrive in their educational pursuits.

Personalized Learning Journey

Central to the experience goals is the notion of personalization. The space endeavors to create a learning journey tailored to each student's unique strengths, weaknesses, and learning style. Our goal is to provide customized learning experiences that optimize understanding and normalize disabilities and barriers in the future.

Global Collaboration and Connection

The adaptive learning space aims to transcend physical boundaries and promote global collaboration among students. We envision an EUt+ campus where by providing virtual platforms and holographic displays, the goal is to facilitate seamless communication and interaction between learners from diverse cultures and geographic locations, fostering a rich and interconnected learning community.

Enhanced Focus and Immersive Environment

The experience goals include creating an optimal learning atmosphere that encourages focus and minimizes distractions. By allowing students to customize their environment, adjusting lighting, sounds, and aesthetics, the goal is to create a setting that enhances concentration and promotes a deep sense of immersion in the learning process.

Empathy and Understanding

The immersive experience aspires to instill empathy and understanding among students. By fostering an inclusive learning environment where individual differences are celebrated, the goal is to cultivate a culture of empathy, respect, and appreciation for diversity, both within the educational space and beyond.

Production

Physical interaction

Displayed Content

As part of the physical segment of the experience, we were constantly contemplating what the sample topic would be to showcase personalized learning.

Initially, it was developed to simulate a mandatory design class and the topic being taught were design principles. The goal was to demonstrate learning of design principles in a personalized manner that could also be immediately applied by moving the elements in the room in a more accessible and individually preferred arrangement.

Upon further testing, the idea evolved to focus more on the concept of personalized learning as opposed to the topic being taught. This was done owing to two factors-

1. A specific topic might deter guests who are not interested in the topic from engaging in the experience.
2. Topic becomes the talking point as opposed to the concept of personalized learning method.

The second leg of the iteration saw the topic being simplified into very simple concepts, such as:

1. Gravity- A ball bouncing (watch a video of a ball bouncing, hear a sound byte that describes a ball bouncing, read a description of a ball bouncing, and use a ball and bounce it to learn what happens)
2. Shapes- Watch a video explaining three basic shapes- triangle, square and a circle, hear a sound byte that describes the three shapes, read a description of the three shapes, and fit the three shapes into their respective frames.

The general consensus from user tests as well as feedback from professors was that it bordered on being too simple/ not entertaining enough to be part of the general ambience of a festival that the visitors would be in.

This brought us back to a brainstorming session to discuss what would be the displayed content to showcase the four learning methods. The rounds of testing helped narrow the brainstorming; it had to be abstract and entertaining.

Of all the songs that were played as background music to help us think and work, a jovial break to laugh at Schnappi Das Kleine Krokodil sparked an idea. Nursery rhymes. As quirky and simple as they are, nursery rhymes are designed to drive home simple messages quickly and strongly. This inspired us to create a minute long music video that is composed

in a nursery rhyme-esque manner that talks about the possibilities of learning in the year 2045.

Music Video Development

Johann Pauli, with his experience in sound and music, composed a track that encapsulated the essence of nursery rhymes and before we knew it, the team was humming along through the day.

Chanda Gauranga toyed with ChatGPT and eventually rewrote a rhyme to better encapsulate the concept while keeping in mind the human aspect of a funny and entertaining rhyme.

With a few days to go for the festival, the voice recording and shooting of the music video was conducted simultaneously, wherein Johann would record a vocal segment and Gauranga would go and shoot that segment while the next person would record theirs in the booth.

It was a race against time to wrap up production as other team members were busy with their respective responsibilities. Despite the struggles and tight deadlines, the process turned out to be a fun team bonding experience and hopefully reflected on the final output.

Implementation

The song was composed and mixed on ProTools while using Ableton Live to record the vocals. Premiere pro was used for the editing along with the visual and graphic effects.

The video was projected top down on a table surrounded by the physical prototypes that were built. Together, the goal was to demonstrate the ease of choosing a learning style irrespective of content and size of the class.

Part of the concept was to incorporate projection mapping that displayed unique projections of the video on top of the physical prototype. Unfortunately, due to time constraints, the idea was scrapped. However, the concept was strong enough to create the intended wow moment.

Digital interaction

Why AR

Augmented Reality (AR) offers a unique perception of digital content laid out in reality. Virtual objects are grounded in reality by e.g. position and can work as an extension or subtraction of reality. This type of subtracting from reality is called “Diminished Reality” (DR).

For this project, we used AR to show how virtual content and reality could work together in the future and we presented this idea with tablets to further abstract this as a “window into the future”. Presenting future technology on current/old devices can often be problematic because users are bound to the limitations of these old devices. The level of abstraction from the tablets helped us to mitigate this and rather sparked conversations about how we might perceive this in the future.

Unity & Vuforia

We decided to try and simulate DR through Unity's SRP and its AR capabilities, in combination with Vuforia's Area Targets. The first step after importing all necessary packages to Unity, was to scan a test room using a rented iPad Pro, which we used because of its LiDAR proficiencies.

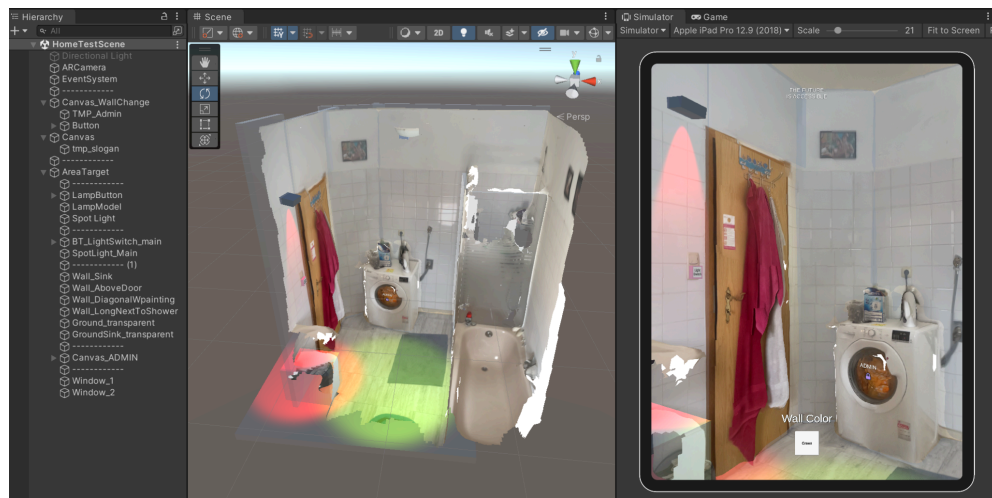
Feasibility Test

Settling for Vuforia's Area Targets meant that the only way to test the application on the AR device itself, is for the user to be present at the exact scanned space. Hence why our scanned test room was at home for fast testing access on the device itself. In order to fully test our idea's general feasibility, our first test included a simple “Test Text” tracked onto a specific real life object, as well as an interactive spatial button that turns a virtual light on and off (see [Img. 5](#)).



Img. 5 Tablet's View from the Feasibility Test

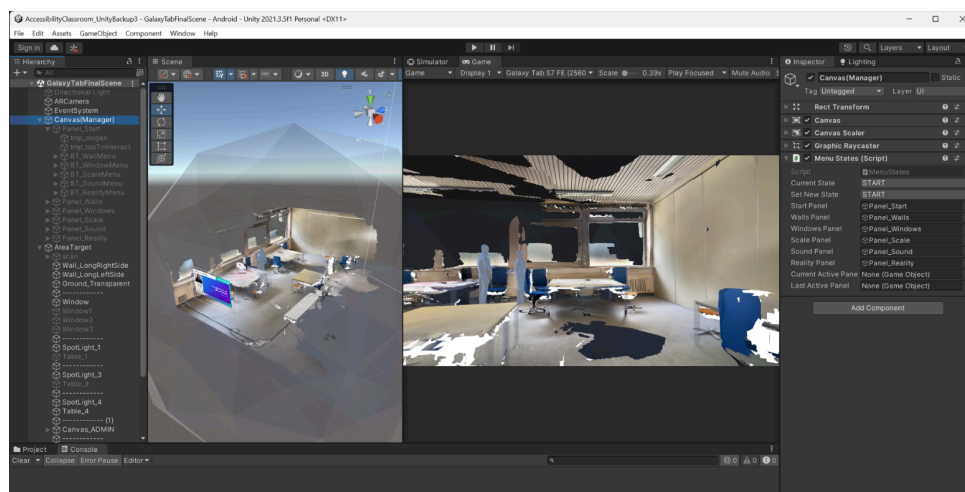
One unexpected hurdle we had to find a solution to was that the virtual lights didn't affect the scanned mesh of the real room. As a quick fix, we aligned Unity's in-built 3D cubes as closely to the scanned mesh as possible, but that also wasn't ideal, as the scanned walls and ground weren't completely flat, which resulted in the undesired choppy look (see [Img. 5](#)). We spent some time trying to find a solution by looking for different types of transparent and light-catching shaders, but none of them seemed to work or achieve the desired look. In the end, we settled on a simple semi-transparent material that we could also repurpose with another of our planned AR interactions, but ideally with enough time, we would have liked to find a more seamless solution (see [Img. 6](#)).



Img. 6 Unity's View from the Feasibility Test

Advancing Development

After greenlighting the general feasibility with the first test, we continued at campus by rearranging our assigned room for the Future Festival according to our concept, then scanning it using the iPad Pros (see [Img. 7](#)) and finally - replacing the scan in Unity. At this point Kristina and Gian split the development of the separate functions between each other.



Img. 7 Unity's final state before the day of the event

Modes

Wall Color

The idea of customizing the walls of the classroom environment was one of the absolute definite must-haves that we identified from the user feedback of our concept interviews. The augmented wall overlay was created using Unity's in-built 3D shapes and a singular material assigned to all of them. Each button was assigned a specific color value and upon interaction, the wall's material color updated accordingly. To provide further flexibility, an additional "clearing" option was incorporated, allowing users to revert to the original wall color if preferred (*see Img. 8*).



Img. 8 Personalizing the color of the walls using the provided color wheel. Additional option to "clear color" is shown on the right of the wheel, presented in white.

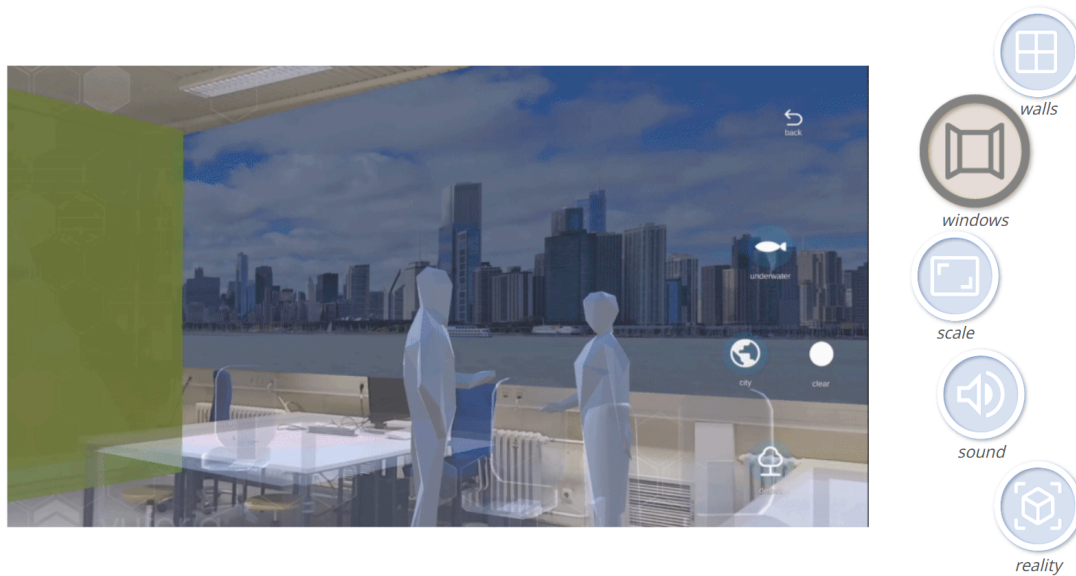
Other additions we would have loved to implement include, but are not limited to:

- a proper color wheel for further flexibility;
- choice between solid color, gradient and texture preferences;
- option to decorate additionally with personal images that would serve as either posters or full wallpapers;
- ...

Window Scenery

The ability to choose what you see outside the windows of your classroom was one of the most well perceived ideas we had.

From Unity's standpoint, the function was developed in the exact same way as the changing of the wall color, with the exception that now each button had a texture assigned to the material instead of just a color value. (see *Img. 9, 10 & 11*).



Img. 9 Cityscape, image by [2]



Img. 10 Underwater scenery, image by Google



Img. 11 Desert scenery, image by [3]

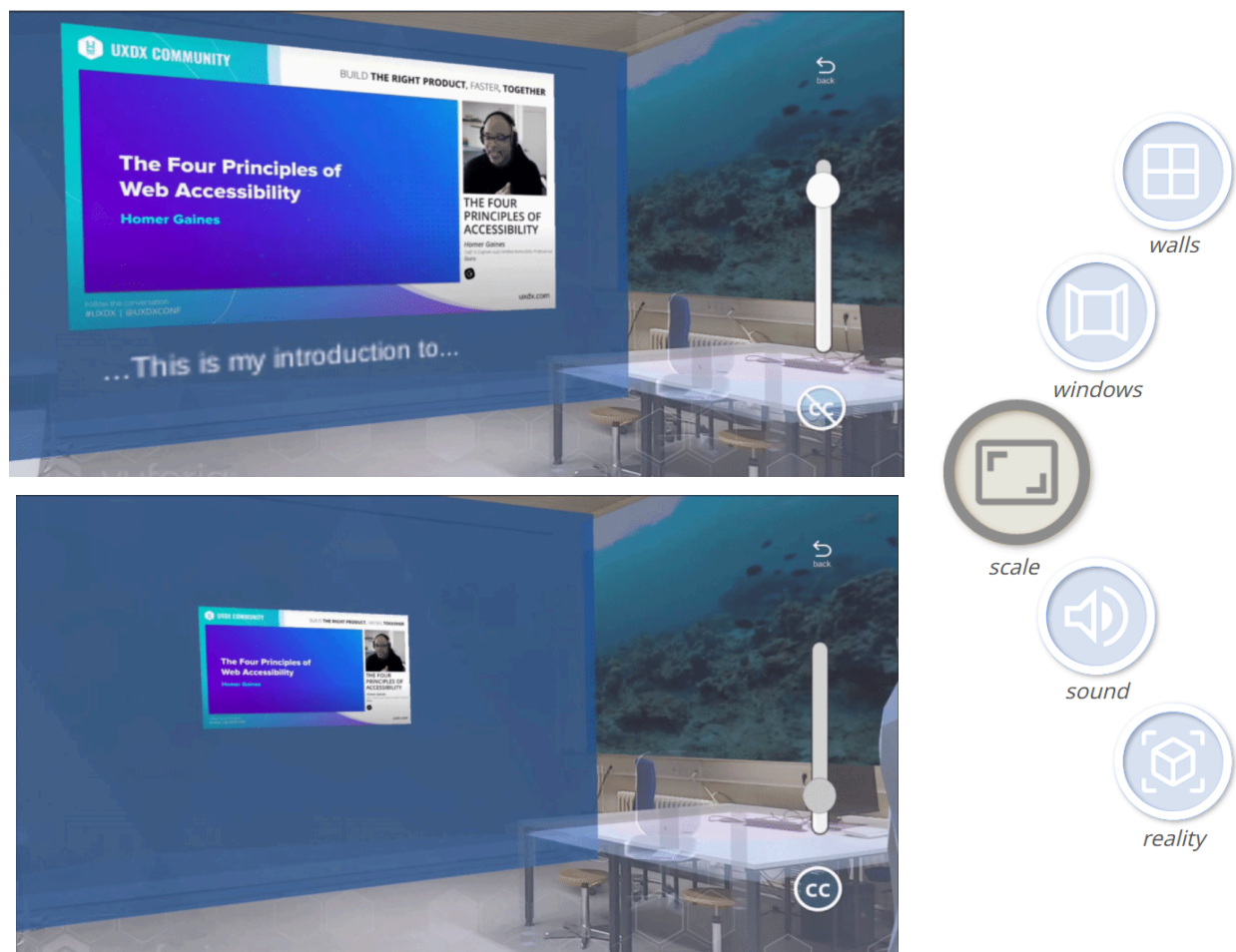
Other additions we would have loved to implement include, but are not limited to:

- visible window frames;
- animated 3D environments; (we experimented, but didn't find suitable environments in the short time frame)
- animated videos instead of a still image;
- build-your-own modular environment;
- ...

Presentation

The presentation resizing was implemented to show visitors the personal adjustment of otherwise university set-up learning material. Traditionally Presentation screens are set up in a way that tries to suit everyone in the room, this often means that the presentation scale is too big in the front and too small for the back rows. By allowing users to customize the size individually we ensure the optimal perception starting point for everyone. This is further expanded on with the subtitle activation allowing to better include users with auditory difficulties or helping presenters to overcome language barriers and oral restrictions.

Inside Unity this feature was implemented with an object scale set to a slider value, allowing to set up minimum (min) and maximum (max) scale values inside the slider UI.



Img. 12 Adjusting the size of the presentation using the “scale” slider. Enabling or disabling the “live” subtitles catered to what’s being presented.

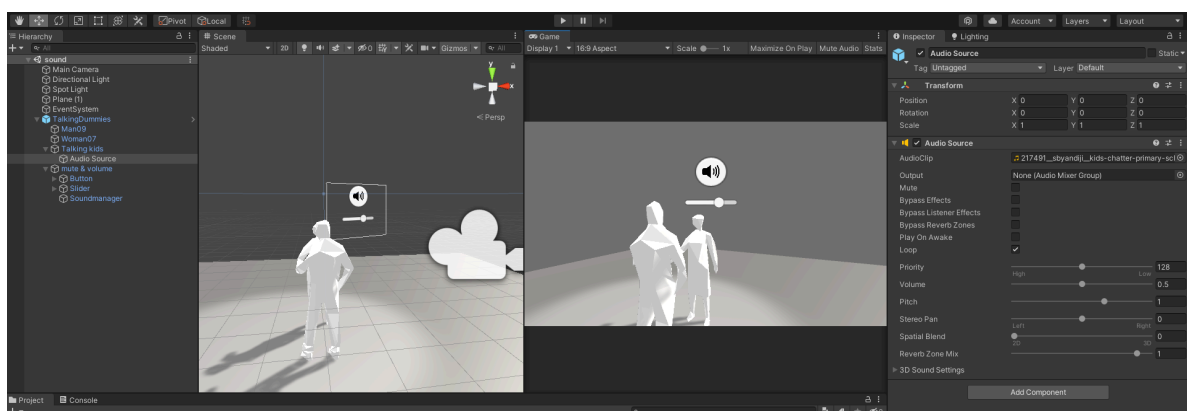
Sound

The Sound adjustment is our first of two diminishing reality options. It allows users to adjust the volume of others in their environment or mute them completely. This supports users further in setting up their ideal learning conditions and allows users with e.g. hearing impairments or auditory sensitivities to participate. The adjustment works hereby in both directions - users could either quiet down others e.g. students or increase the volume of supporting elements like the voice of a professor/presenter.



Img. 13 Adjusting the volume of the virtual crowd using the slider or completely silencing it using the quick action button.

Inside Unity this feature was implemented with the audio source volume set to a slider value once more allowing to set up min and max values directly in the UI. The mute functionality was implemented with the Play and Pause functionality of the audio source.

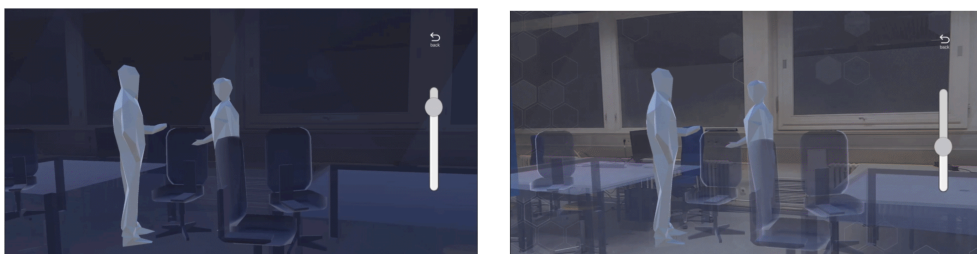
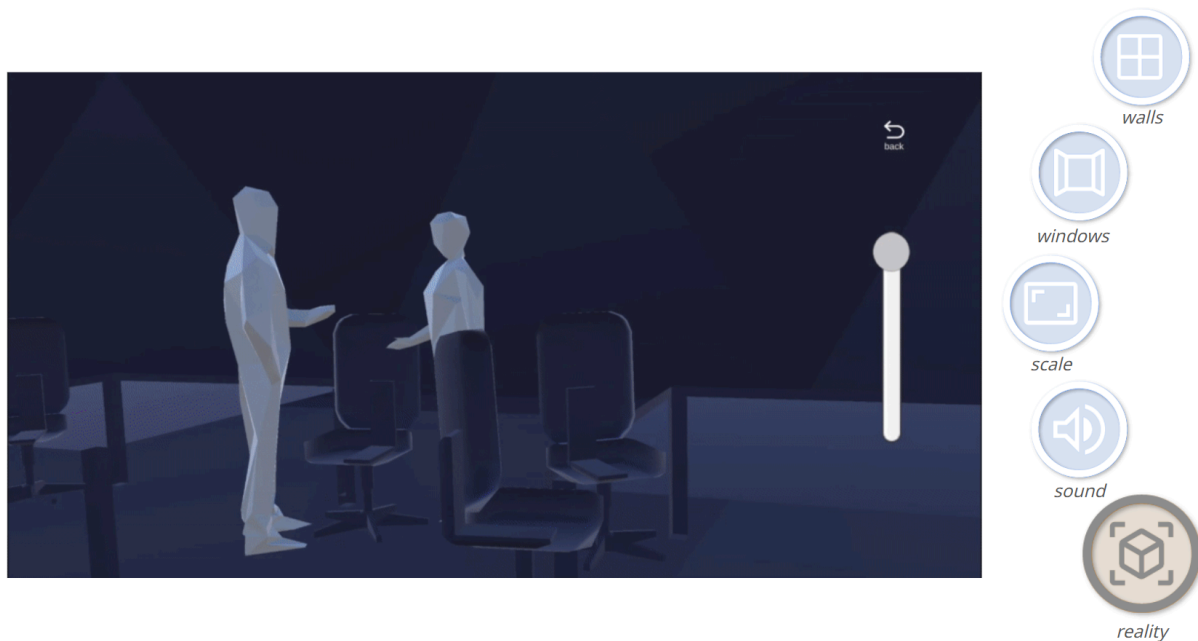


Other additions we would have loved to implement include, but are not limited to:

- additional option to adjust the volume of each person and/or object individually;
- informative UI elements on top of each person and/or object's volume;
- ...

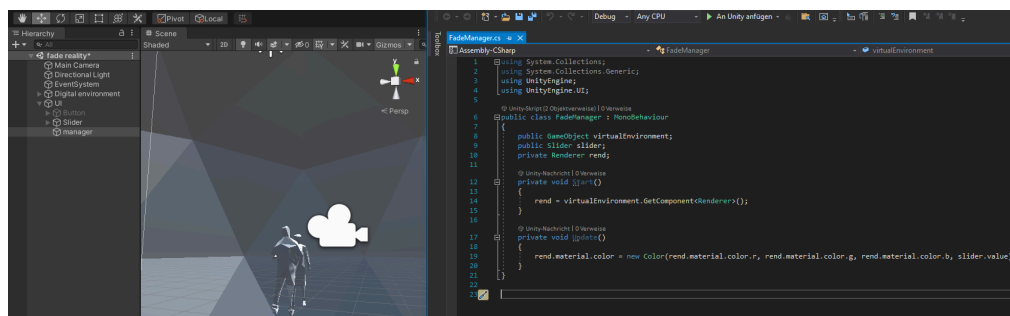
Reality fade

The Reality fades or blend option is our second diminishing reality option, allowing users to subtract reality and blend into a fully virtual environment. This feature illustrates to users the option of removing visual elements from their learning environment. These elements can range from distracting furniture to bothering people. It helps them to set the focus on the learnings and supports a wide range of struggles e.g. ADHD.



Img. 14 Diminishing the real world classroom's space into the fully virtual space using the "reality" slider.

Inside Unity this feature was implemented by setting the alpha value of an instanced texture to the values of the slider, blending the virtual environment smoothly between 0 (hidden) to 1 (fully visible).



UI & UX Design

Our AR application could not possibly exist without an UI (User Interface), so we tested several options we could go with - a fully spatial UI, a fully flat UI or a mix of both:

- The “fully spatial UI” allowed us to tap directly on the lightswitch through the camera view, which turned the respective light it belonged to on or off. While this method felt most futuristic, it proved to be quite uncomfortable to interact with, as the tablets are already big and it destabilizes the user’s holding preferences.
- The “fully flat UI” allowed the user to comfortably interact as it was positioned on the right side of the screen in an optimal location for a thumb swipe across the whole screen.
- The “mixed UI” allowed us to tap directly on a wall through the camera view, which in turn would open the 2D sub-menu populated with the color picking options. With this method however, we figured that when the 2D button was positioned in front of the wall, the raycast of the tapping went directly through and collided with the wall as well, which hid the sub-menu. This was not the desired effect and it proved to be very unintuitive at its current stage, so we decided against it.

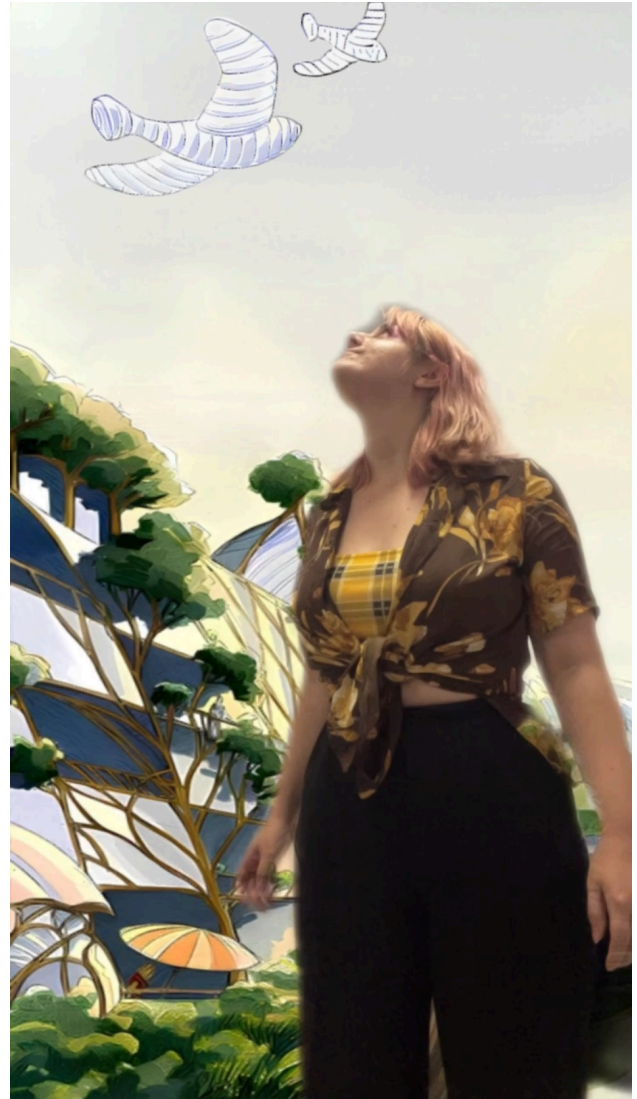
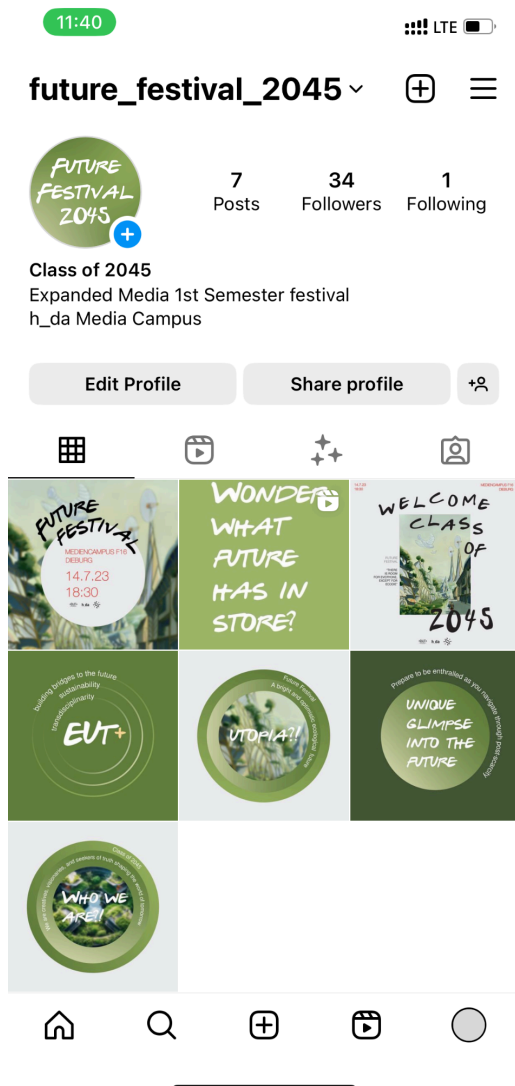
Last but not least, the visual design of the buttons was initially inspired by the concept of glasmorphism, but due to the complexity of the implementation and the time limitation, we settled on the next closest variant and took inspiration by Microsoft Hololens’ semi-transparent button designs.

Other additions we would have loved to implement include, but are not limited to:

- a step-by-step onboarding:
As a non-intrusive UI at start, we had started developing a step-by-step onboarding for each specific interaction one after the other. The UI consisted of a 1 liner task description floating and highlighting the objects that need to be interacted with. The user could only proceed to the next step by having the current task completed. However, due to the harsh time restrictions, we decided to keep the whole menu visible from the start;
- a properly developed spatial or mixed UI;

Social Media

As part of the Meta group, we were assigned to plan the marketing and execute it. We came up with a social media plan for Instagram and created an AR filter to let people immerse themselves in the future we illustrated in the poster of the festival.

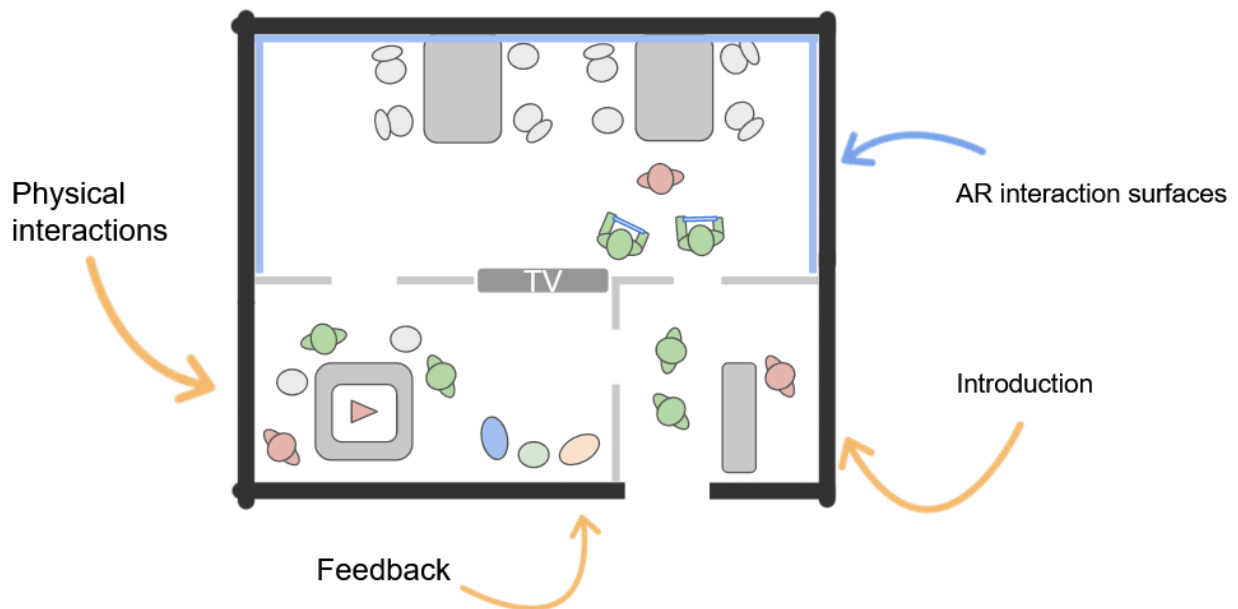


[A2] Instagram Account

Event day

Layout

The room focusing on education was divided into four segments: the introduction, the personalized learning environment, personalized learning methods, and the reflective feedback area. It is structured in a way of a guided experience to provide an exciting and immersive feeling.



Img. 15 Top-down view illustration of the classroom setup for the day of the event. It consisted of 3 separated parts - introduction, augmentation and physical interaction.

Introduction

In the introduction stage, visitors are provided with name tags to stick to their clothes. Only, it wasn't a typical name tag, but an icebreaker that set the tone for the need and benefits of a classroom that adapts to the needs of every individual student.

This gave us the opportunity to reintroduce the topic of "classroom 2045" and segue into the topic of disabilities and difficulties in education.

The visitors were encouraged to write what they struggle with in a classroom/ learning experience. What we saw was a range from 'colleagues' to people struggling with ADHD.



Img. 16 Examples of the most common visitors' struggles we identified.

AR-Part

Opening Statement & Device Distribution

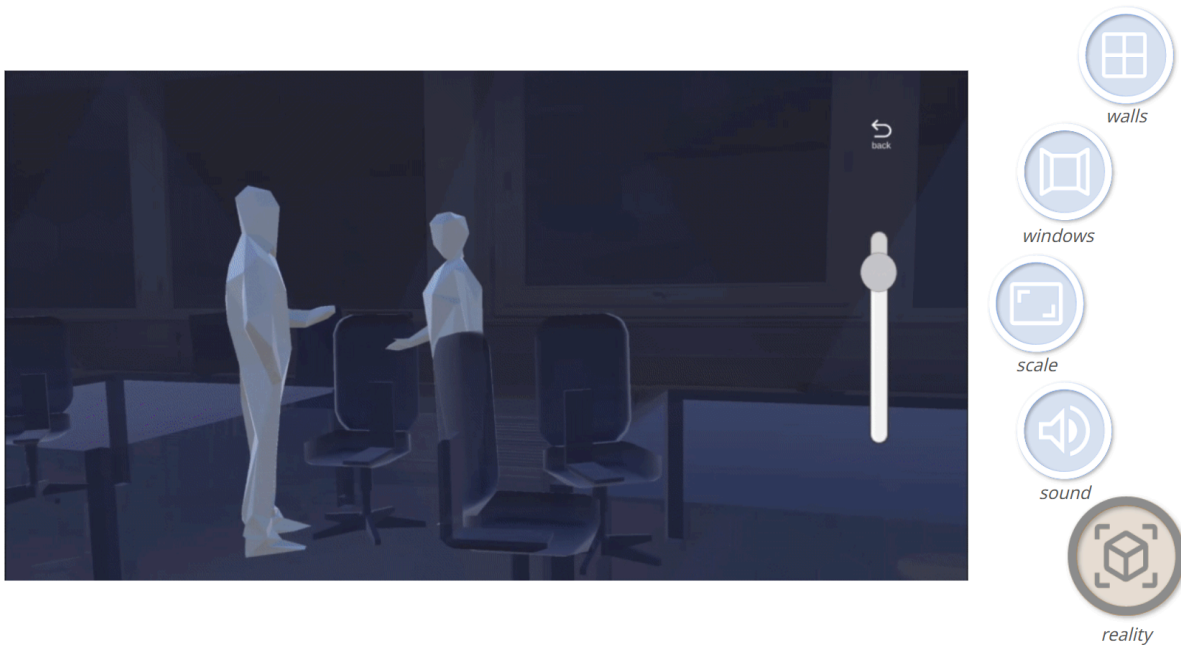
After everyone had finished writing, we invited them to step into the next area which at first glance resembled an empty classroom. There, two of the visitors were given a tablet with the augmented application already open on it. In a case where more than 2 visitors were present at the same time, we asked them to pick 2 persons among themselves that will be interacting with the tablets. The initial view through the tablet's camera shows the real environment with an added touch of augmentation such as - virtual classmates being present in the room and talking to each other, a presentation on the wall, as well as a semi-transparent overlay of the virtual 3D environment layered on top of the real world (see *Img. 17*).



Img. 17 Initial view of the augmented classroom, seen through the AR device.

We proceeded with a guided step-by-step onboarding of the application and its use cases, starting with a brief explanation on what its goal is - **as newcomer students & staff of the future campus, they were introduced to our accessibility system, which is designed to adapt the educational space to their own individual preferences and needs.**

During this introduction, visitors heard annoying background noises (full classroom) played by the Tablets. As many of them leaned forward to better understand us, this created our segway into the application. We explained to them that they should press the sound button to mute the other classmates so that they can better follow us. This allowed them to experience an actual use case and provide them with a clear understanding of what we aim to achieve. We noticed our big "WOW moment" from the visitors was the augmentation of the view outside the windows. Many expressed that they always dreamed about changing what they see outside and that they often wished for a change of scenery.



We ended our tour with the diminishing reality option, which also created a lot of interest and sparked discussions of when and how they would have used it.

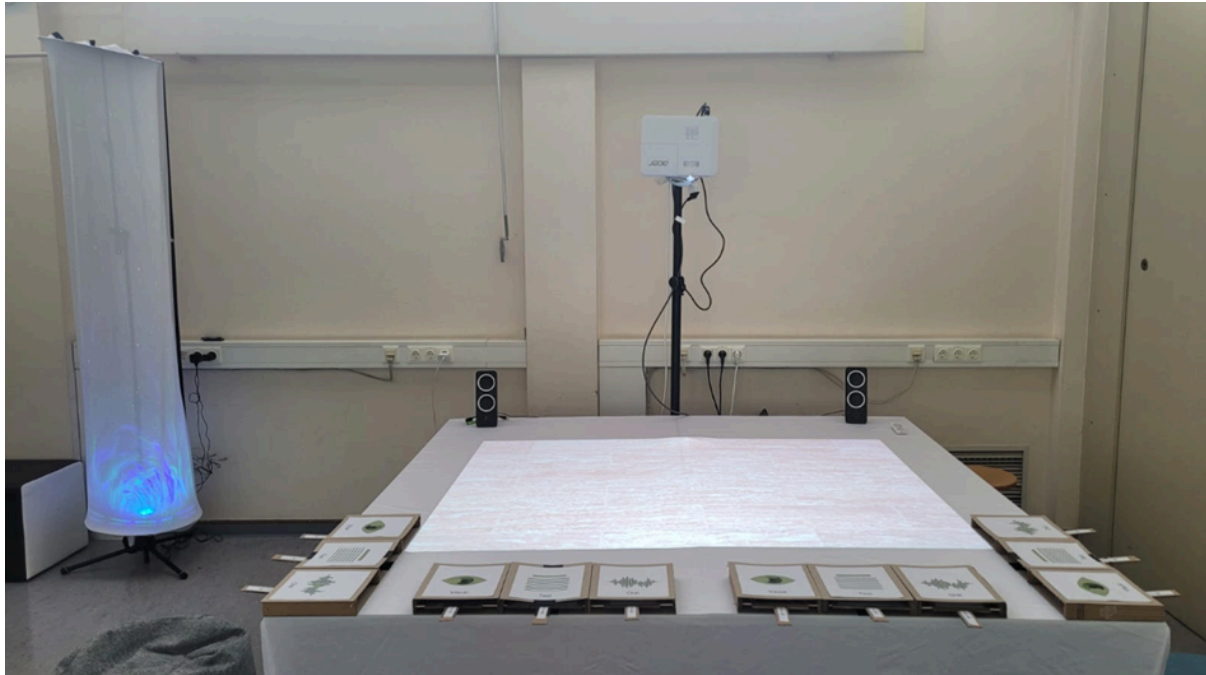
After having the visitors go through all the classroom environment setup options, we collected the tablets from the visitors and redirected them to the next stage of the experience where they would learn about the 4 major learning types we identified in our research, as well as get to set up their own learning type preferences accordingly. At this stage, one of us stayed behind to reset the AR devices for the next visitors.

Learnings and impressions

Overall, we achieved what we intended with the AR application and both the body language and the spoken **feedback by the different visitors solidified our concept and proved that each component is something that people definitely want and need in a classroom.**

For example, many visitors shared their relief with us when they found the option to decrease or mute the crowd noises. A lot of them even made jokes about muting their colleagues, partners and/or friends, which was always fun to experience. Additionally, the fact that it was a repeating joke coming from a lot of different visitors proved once again that our concept could have a bright future.

Practical part



Img. 18

Four people could simultaneously take part in this experience. The first thing they were noticing were those paper devices.



Img. 19

The cover of it says: Visual, Text, Oral. Our intention here was to give people the option to choose their preferred learning method. In future, students shall have the choice of picking their preferred learning method to learn more efficiently. Also, they should not get pressured and bored about the learning-style but have the opportunity to learn at their own speed and method.



Img. 20

Once the visitors pressed the buttons, each of them had indicators on them.

VISUAL: shows a video of the content

TEXT: shows an informative text about the topic

ORAL: hear it like an audiobook

The fourth method was kinesthetic, which is obviously not on the device since it's all about moving and practicing. This was also a good transition to the following part. We were asking the visitors to choose their preferred learning method before we progressed to the video part. Once they've finished watching, we asked them again, IF it's still the same or something changed. Some of them pressed all three afterwards, some stuck to their previous decision.

To showcase those methods, we created a one minute Nursery Rhyme Song. The intention was to hook the audience and get into an amused track. Although it was a very childish and funny way to teach, people went away in a good and laughing mood.



[A3] Music Video

Response

The physical experience, ie, the personalized learning stage is introduced after personalizing the learning environment which is an AR experience. The contrast between the tech experience and the simplicity of the physical experience set the guests into a jovial mood, which is ideal for learning- keeping it fun. What we witnessed was simple joy in playing with the prototype which got amplified when the video started playing.

It was very satisfying when visitors would request to watch the video again and when we would hear people humming the tune around the campus.

Certificate

To give the visitors the impression to really be part of an exhibition, we've created a certificate which they can keep. We tried to sell them (in a funny way), that a very expensive AI now analyzed their learning style. Throughout the “semester” we offered them that they can come back to us to recalibrate the method, to keep up to date.



Img. 21 The certificates we were giving out to people by the end of their “setup”.

Feedback

After the whole experience part, we gave the visitor an optional chance to leave some feedback on a whiteboard. Almost everyone left positive feedback – we were very happy.



Img. 23 The written feedback we got.



Img. 24 The visible feedback from the visitors' expressions.

Conclusion

Project Achievements

- developing a very strong proof of concept about a future where accessibility is fully integrated and normalized with the help of assistive technology
- developing a fully interactive AR application within a week and a half
- grabbing the hearts of the visitors with the playful music video
- grabbing the hands of the visitors to lead them into an interactive exhibition to have a dynamic experience, but also keep the topic and the message in focus

Group Learnings

- It's important to know the strengths and weaknesses of every single group member to be as efficient as possible. Also it structures future steps way better.
- It's important to have a project leader / project manager to keep the group members on track and not to drift aside.
- Speaking and communicating is a major way to delete misunderstandings.
- Be as participative as possible and not rely too much on others.
- Structuring the workload is a mandatory task.
- It's not necessary to have a fully technical experience to sell the an idea

Personal learnings

Gian:

- iOS development has a range of problems when developing from Windows.
- To transport complex concepts it can be beneficial to use abstraction and carefully craft voids that users can fill with their imagination and let them explore how they think the future could look like
- Improved my project management

Johann:

- Sometimes taking steps back is the right direction to progress.
- It's often the more simple things which are impactful in the end.
- Working in a group of very creative people is amazing. Sometimes it needs a good structure to filter the very best ideas.
- Talking and communicating is a mandatory thing to be successful.
- Having all research aspects covered and being well prepared is a keypoint to be successful.
- Prototyping is a mandatory way of developing a good product. Once you set it up in real life, new innovations come into your mind.

Kiana:

- During the semester, we all work on each task together, we did the ideation in all parts together and the team expect everyone to participate and propose suggestions about everything. At first glance, it sounds such a team work but the reality behind it has another story. I with my background in graphic design and marketing, feel the pressure of “Why I can’t think about this and that (things that I do not have knowledge about them)?”. From this experience, I have learned that teamwork does not mean that everyone should work on everything but we should concentrate on our skills and abilities. Next time I expect each of us to propose spectacular ideas regarding their skills.
- Moreover, I understand that if the concept is strong enough, a simple installation can convey the message. Spending more time on research and the conception process is an important step in creative work. Also, regarding technical skills, I get acquainted with the process of making an AR app.
- In the execution phase, I was in charge of social media as a member of meta group and also providing any visual support to the team from designing the poster to create the UI design of the AR experience.

Chanda:

- Learning to let go and work in a larger group and trusting each person to do their work
- Having faith in my abilities and backing it up when pushed against a corner
- The research part, though longer than I expected, was still a lovely time where I got to dive deep into various new topics.
- Re-inforced my love for creating unique experiences

Kristina:

- coming from the Expanded Realities bachelor, I learned for the first time what it is to be working together with people who come from different industries than me
- I learned quite a lot theoretically throughout the research phase of our project, such as very niche Solarpunk and SDG related or inspired topics and products and much more from my groupmates, thanks to our “research findings” meetings we had in the group

Team Responsibilities

Collective: Research, Ideation, Concept, Interviews, Production, Acting

Gian: Unity AR development, Project Management

Johann: Music Video: Song Production, Physical Prototype

Kiana: Social Media, Visual Design (Posters, Stickers, Certificate, UI Design)

Chanda: Music Video: Direction & Editing, Physical Prototype, Documentation Video

Kristina: Vuforia + Unity AR development, Project Management, AR Filter for Social Media

Sources

[1] EUt+ mission statement:

<https://www.univ-tech.eu/mission-statement>

[2] Chicago city urban skyline panorama, Image by TravelScape on Freepik

https://www.freepik.com/free-photo/chicago-city-urban-skyline-panorama_26743880.htm#query=panorama&position=3&from_view=search&track=sph%22%3EImage

[3] Panoramic shot of the famous monument valley in the USA, Image by wirestock on Freepik

https://www.freepik.com/free-photo/panoramic-shot-famous-monument-valley-usa_17245568.htm#query=panorama&position=0&from_view=search&track=sph%22%3EImage

[4] <https://www.who.int/news-room/fact-sheets/detail/mental-disorders>

Appendix

[A1] Trailer: <https://vimeo.com/849184740>

[A2] Instagram Account: https://www.instagram.com/future_festival_2045/

[A3] Music Video: <https://www.youtube.com/watch?v=-nA1yBAO4ww>