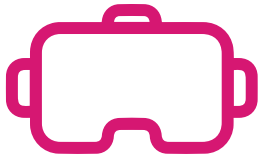# USE OF VIRTUAL REALITY
WITHIN EDUCATION

**RECOMMENDATIONS FOR TEACHERS,
IT-SUPPORT AND MANAGERS**

- CASE VOCATIONAL EDUCATION
- APPLICABLE TO EDUCATION IN GENERAL

WHY VIRTUAL REALITY?

- Students love it as an alternative way of learning, and we aim to offer versatile learning environments for students

- Possibility for real, transnational tasks and meetings for international student teams, meeting the persons "for real"

- VR offers a good way to practise online communication in a fun way in a real international team

- VR can be a training room for students, also with special needs, to simulate real life situations that can be repeated and you can get guidance on

- VR is inclusive, even for students who cannot travel for mobility, or cannot attend school because of illness etc. It is possible to attend training and to meet foreign people via VR

- Shy students can benefit from the possibility to communicate and learn in the form of an Avatar. They can modify the Avatar to look like what every way they wish to.

- In general, use VR as simulation and replicate real-life situation, e.g. to avoid costs and to create situation that are difficult to arrange in real life

- Students can also practise on their own, e.g. learn language, learn about work safety, first aid, get acquainted with difficult customer situations that are hard to practise in real working life etc

- Added value compared to Teams or Zoom: students get a feeling of really meeting the other persons live as they "use" the virtual space, move around, shake hands etc

- Experimenting with new technology is part of learning digi-skills - for both students and staff

- Mixed Reality (MR) that combines elements of both Virtual Reality and Augmented Reality is spreading fast in numerous sectors – a future working life skill

STUDENTS' EXPERIENCES:
COMMUNICATING IN VR

- Some felt it easier to communicate in VR rather than in face to face -situation

- Some students felt connected already after one meeting in VR

- Students started to brainstorm interactive tasks in VR – in other words, teachers could eventually take a step back and stay more at the background

- Students were helping each other while in VR on the technical aspects – peer learning

- A fun, new learning experience for most of the students

- Some did feel insecure to speak in English, even though they had experience of videogames

- Some students would have needed even more technical support at the beginning

RECOMMENDATIONS FOR TEACHERS

WHAT TO CONSIDER WHEN USING VR IN TEACHING

- **RESOURCES:** a quiet room (no eco, preferably soft flooring, space where there no-one else trespassing, where it is enough space not to bump into furniture) or several rooms to avoid eco/interference of sounds if the students are talking.

- **RESOURCES:** a space where it is safe and secure for students to put the VR-glasses on. Some students can feel embarrassed to be looked at with the VR-glasses on.

- **RESOURCES:** a support person/someone who can help with technical issues with the VR-glasses and their functionalities. Especially in the beginning, because there will be a lot of support needs before students learn the basics.

- Teacher roles: for communication in English, in the beginning it is good to have 2 teachers in VR, one giving the instructions, and 1 teacher going around the student groups in VR and helping them out. This is task-specific and VR-platform-specific -thing. Also student's language skills levels play a part.

- Teacher can use screen cast -function to see where the students are in VR, what the student sees. Screen cast is a command available on the VR-glasses and an app on the phones as well.

- A backchannel for teachers is needed/recommended during meetings, such as WhatsApp or Teams, especially for technical support. For example, colleagues can help if you have technical challenges, or you can communicate about details concerning the VR-session

- Take 2-4 students in one go to VR. Arrange with fellow teacher what the rest of your students do meanwhile

- Co-planning of tasks with teachers and students is important. With students, to motivate and engage them more. With teachers, so that the content suits our students, and the curriculum.

- Decide upon relevant learning aims/goals and follow that/if they will be met

- Learn in class, in advance, the skills that are in question, e.g. to discuss various topics in English (school, studies, food, hobbies)

- Discuss safety: don't share private information such as phone numbers, addresses, passwords

- Discuss good online communication guidelines, such as include everyone in discussions, friendly small talk and conversations, greeting such as shake hands and give high-fives, respect everyone's personal space and say your excuse and goodbye when leaving a conversation.

- Take 2 sessions to practice with your students, to learn to use VR-glasses and the chosen VR-environment: modifying avatars- taking pictures you want to use, and bring them to the VR-environment - make sure which colleague is the admin in the VR-environment, and can invite the participants

- Max 30 min at a time in VR, to avoid dizziness

- Choose students who have a similar age group, so that they can have more to talk about. They will have similar experiences to talk about

- For implementation, case "COMMUNICATION IN ENGLISH", arrange scheduled meetings with your partner school's teachers

- E.g. Mondays at 13:00 two students per partner school meet in the VR-environment

- Students discuss with the help of their uploaded photos

TECHNICAL RECOMMENDATIONS FOR IT-SUPPORT AND TEACHERS

INTERNET CONNECTION

Meta Quest 2 VR-glasses: 3Mbits works, depending on how many persons are using the same wifi. Should be OK for 2-3 people in one go.

In order to stream a 3D low resolution VR experience in full screen mode — which can be found with most VR head-mounted displays — at least 25Mbit/s is needed.

Information source What Internet Speed Do I Need For Oculus Quest 2? – Novint.

For HD resolution (not recommended) (4K) 80-100mbps -> link to information source.

If your school does not have a good enough Internet connection, you may

- share your 5G or possible school's 5G mobile phone connection directly from work phone via WLAN or via USB

- For sharing of Internet via your phone -> remember to bring the charger, as it takes up a lot of phone battery or use an external powerbank.

For sake of comparison:
- Teams-videocalls (withouth sharing the screen)

- one to one, resolution 1080p - 1,5 mbps

- group call, resolution smaller - 1 mbps

- link to information source

EQUIPMENT

For best, immersive experience, you do need VR glasses. Recommended so called "stand-alone" glasses for entry-level, such as Meta Quest or Pico Neo

Meta Quest VR –glass batteries -> you may use the external recharchable powerbank, to avoid running out of battery. Normally the battery should keep for ca 2 hours, however, sometimes the VR-glasses are not fully charged when you start using them.

Take out the batteries when you are not using the VR-glasses (batteries in the "controllers"), or they might run out because controllers are not necessarily switched off automatically. Have extra batteries at hand.

Other options if you do not have VR-glasses yet:

- use laptops until you get a faster web where surface works OK. Please note minimum requirements for laptops!

- The surface, i.e. the touch-screen pad, doesn't run VR quick enough

- Headphones with microphone -> the sound may circulate without headphones, even though VR works without headphones. Basic headphones with microphone with wire should work OK.

- If you want to bring your own custom 3D-models, e.g. art pieces or tools into VR, you may use the new Iphone for scanning or Matterport–scanner for example. Easier option is to download 3D-models from Sketchfab webpages. See Links on the VRinVET - website.

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RECOMMENDATIONS FOR MANAGEMENT AND IT-SUPPORT

STRATEGY

- What is the school strategy on the use of new technology, including VR?

- What kind of staff training is needed, and where to get it?

- Have expertise available how to optimize pedagogical use of apps and new technology in general

- Plan together with teachers, IT-support and HR how and for what to use VR? E.g. use readily available VR-rooms e.g. in GLUE, or start creating more content e.g. in Wonda VR or in Spatial.

- Budget to purchase the equipment: good enough laptops, and/or VR-glasses, licenses to commercial VR-platforms like GLUE or WONDA, 3D-scanning device, Internet –connection

- Time resources: available hours to plan the activities, and to carry them out, responsibility for the equipment and how to get hold of them, monitor the equipment where they are, monitor the students during the use of VR, time to evaluate the outcome/impact/ needs for improvement.

SUPPORT ISSUES

- IT/digi support is needed to help teachers set up, run it, and develop the use of VR in teaching: managing the licenses, managing the VR-glasses, securing the internet connection and/or 5G-routers to create one, downloading and updating programs onto laptops, setting up user accounts to VR-glasses, charging the VR-glasses, keeping the VR-glasses safe and distributing them and collecting back.

- Where do you store the VR-glasses? How do you share them, and how to coordinate this? E.g. one VR-classroom that can be reserved by teachers? Or VR-glasses directly to the campuses where teachers use them?

PARTNERS PRESENTING THE RECOMMENDATIONS

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(coordinator)

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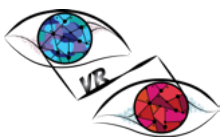*DK*

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VRinVET

For more information, please visit the VRinVET
project website "http://www.vrinvet.eu"

**More information about the Erasmus+
PROGRAMME: www.oph.fi/erasmusplus**

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