Simulations in Education and Research

A Public Values Perspective

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GÉANT

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MISSION

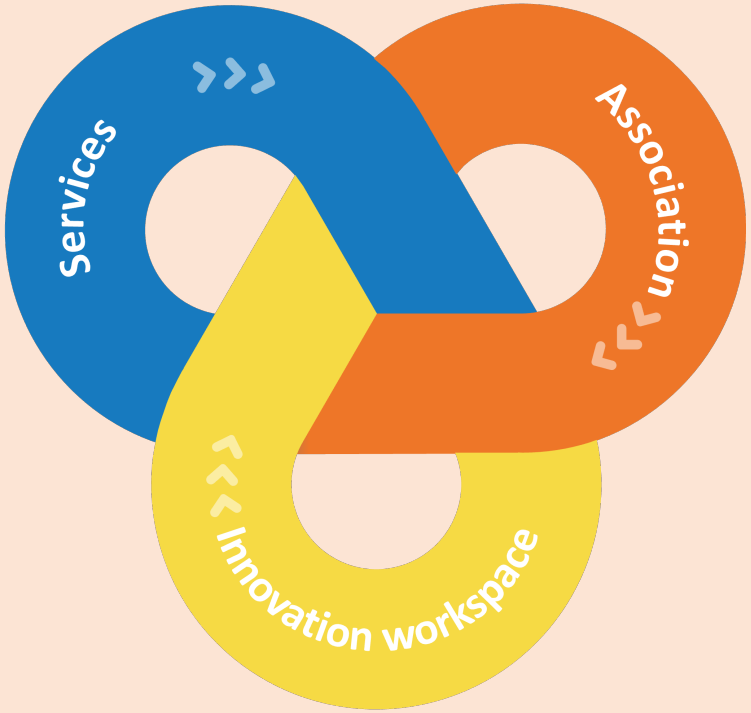
SURF makes reliable and innovative IT facilities possible, with which Dutch education and research can excel.

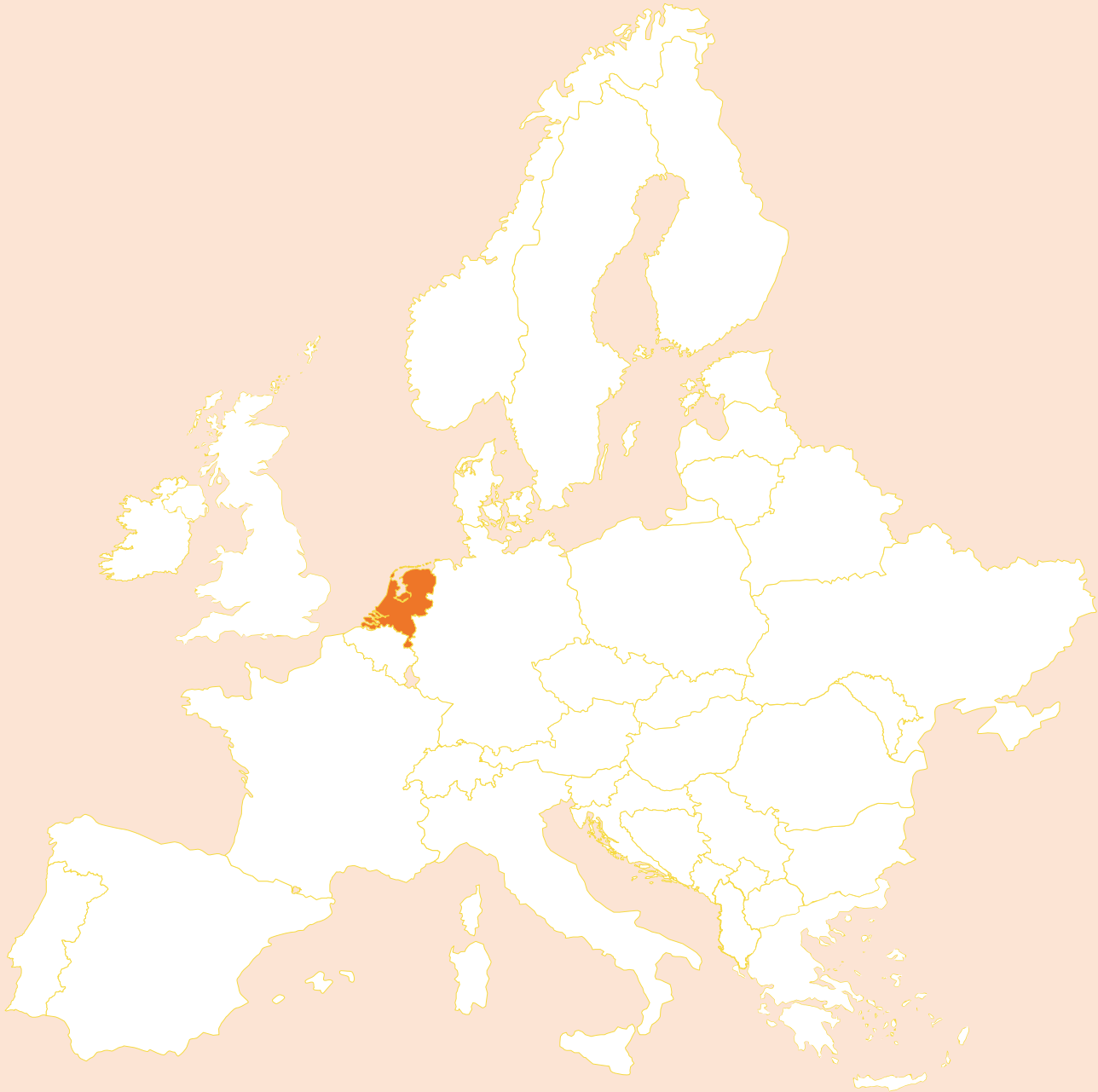
VISION

SURF stimulates the formation of ecosystems in which members and their stakeholders collaborate, innovate and share knowledge on the basis of shared values and agreements.

Three Parts of SURF

SURF's three roles that reinforce each other to grow together.





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Your Presenter

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Responsible XR
Education & Research

SURF

Three Parts: One Project

XR Case Examples 1 & 2

Public Values in Education and Research

Responsible XR

The Process

XR Tour

Meeting with members and interviewing for case examples

Public Values

Desk research / interviews / Workshopping and weighing values

Writing and Development

Reading, writing on XR in education and research

Responsible XR

Understanding and applying public values at a new level

Internal/External Reviews

Towards a common understanding. Reviews by Case example researchers.

Publishing In September

Who here has been in ‘Virtual Reality’?

What is eXtended Reality?

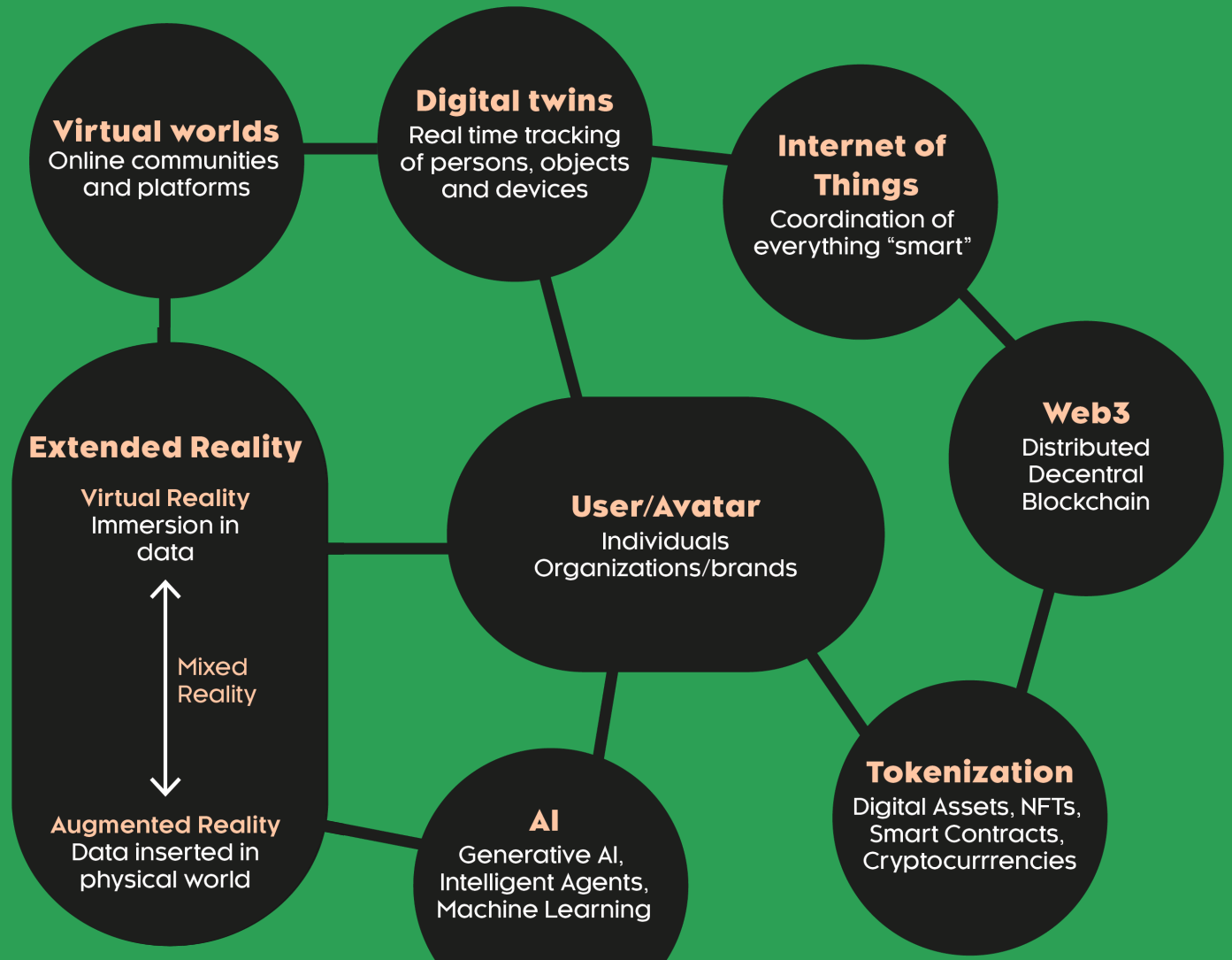
Is it the Metaverse?

Is it virtual worlds?

Is it in my phone?

Is it a culture?

What layer are we talking about when we say Metaverse?



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What is eXtended Reality?

What is the connection to Public Values?

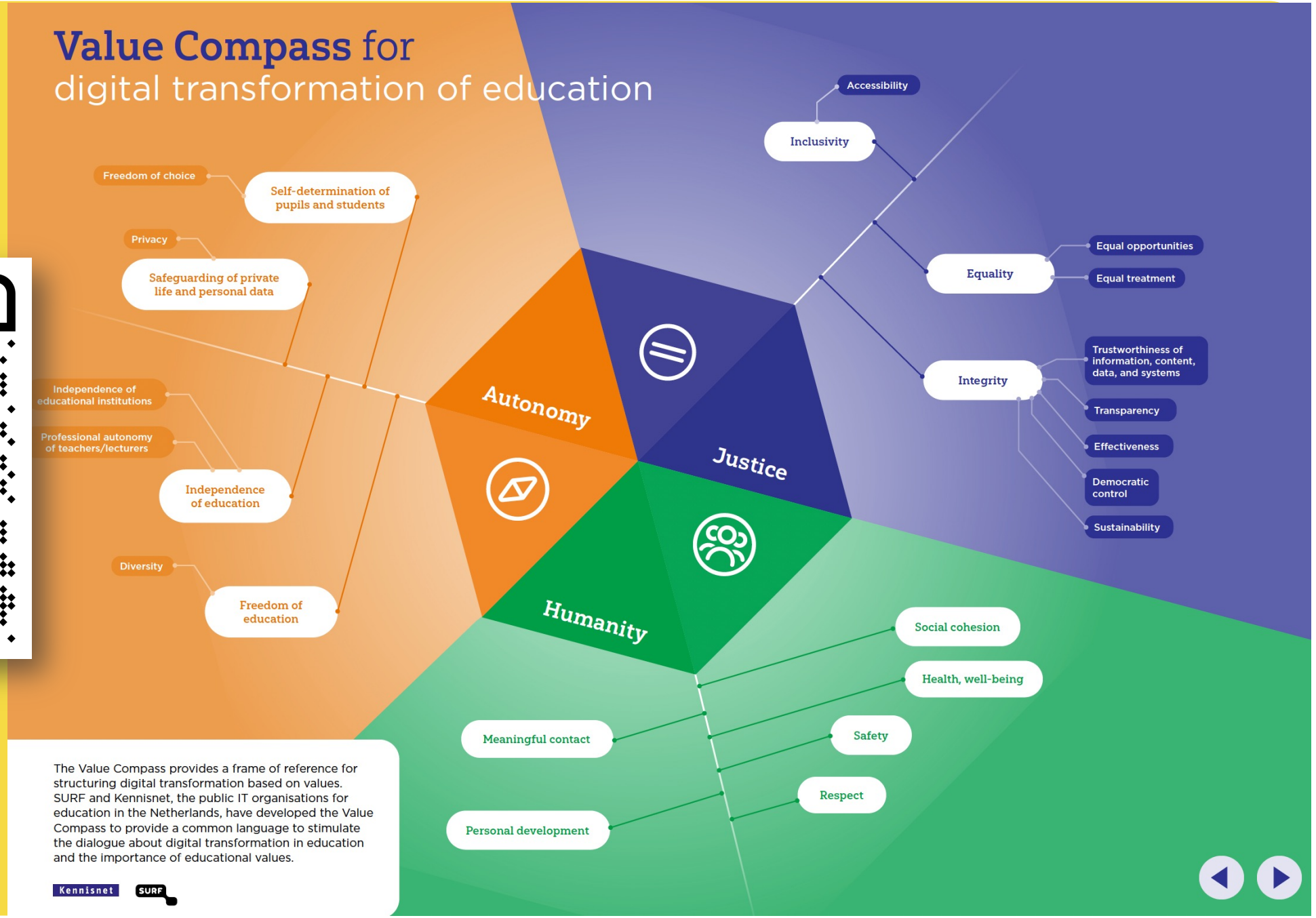
XR & Public Values: Connections

- A perspective from public values could be taken to:
  - Explore how considerations could be made from the technology to a public value.

&

  - How XR technologies can be considered as mediating/shaping both:
    - The public value considered and
    - The learning experience described in the case examples.

Value Compass for digital transformation of education



Download the Value Compass Here

The Value Compass provides a frame of reference for structuring digital transformation based on values. SURF and Kennisnet, the public IT organisations for education in the Netherlands, have developed the Value Compass to provide a common language to stimulate the dialogue about digital transformation in education and the importance of educational values.

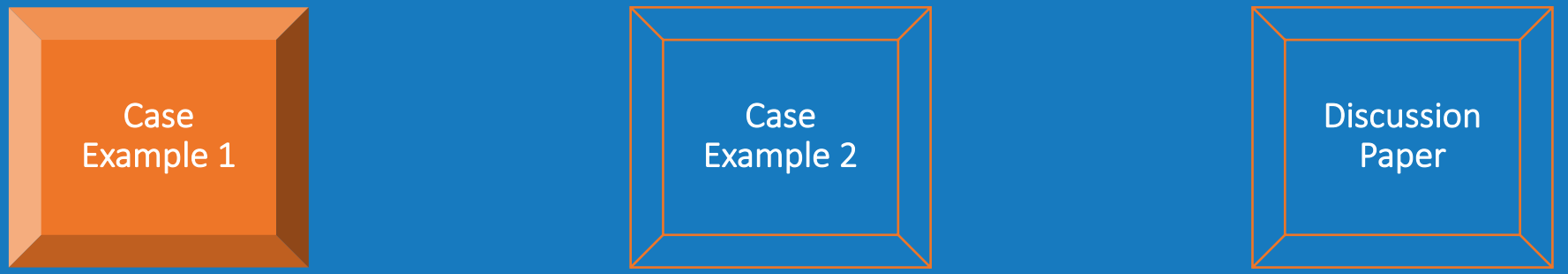
Kennisnet SURF

Asking --- Questions

Asking [More Critical] Questions

→ Means recognising that we are responsible for shaping better simulations that will in turn shape us.

Case Example 1



Case Example: VR Training in Labs

A VR organic chemistry labs experiment for laboratories in the Netherlands used to cope with both training students on new lab equipment, their feelings of preparedness in the lab and give virtual access to it during closure times during COVID 19 lockdowns.

- **Learn about the lab layout, its tools and what to expect before going into the real thing could be extremely helpful for new students.**
- **Platform for a variety of scenarios found in labs and with varying educational methodologies including challenge-based learning. The introduction of virtual labs with VR is a new experimental step for these institutions.**

Personal Development (Humanity)

Defining

Education should encourage self-development by incentivizing expression of the learners' character and their relation to the world (Bok et al., 2021).

Questions

What process or training do we as an institution see as appropriate with VR technology? How can we facilitate that training better in VR than in person?

What features of the real world should be not added to the virtual one for the betterment of experience or focus?

Which opportunities open to students who choose to use VR-based training that are not available to in-person trainings?

How might implementing XR technologies change the personal development goals of our students or staff?

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Inclusivity (Justice)

Defining

The value of inclusivity is found by keeping education open to all learners (Bok et al., 2021).

Questions

Are our simulated laboratories and accompanied trainings developed with pedagogy in mind? If yes, what are those pedagogies?

Are we the owner of our own digital twin/simulated laboratory?

What risks in data governance do we need to consider if the VR-based laboratory collects personal data on our learners?

Who can't be included in a VR-based laboratory? Who is missing from the conversation or trainings?

Self-determination Of Pupils And Students (Autonomy)

Defining

In the context of public values, students should have the right to choose the type of education that suits them through self-determination (Bok, et al., 2021).

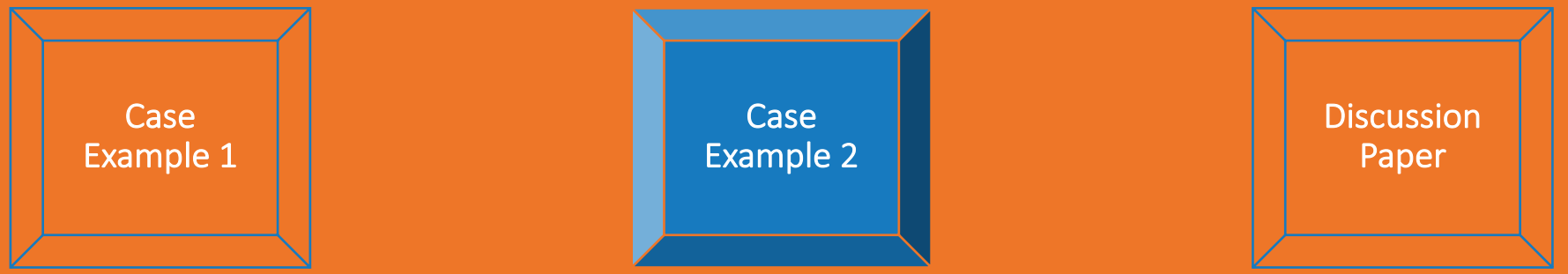
Questions

What current challenges does VR-based laboratories resolve for students and are there other technologies that could be viable instead?

Can VR-based increase the safety and privacy of certain students that in-person laboratories cannot?

Does the VR-based training in virtual labs enhance the experience current learning goals or pedagogy?

Case Example 2:



Case Example: VR Presentation Training

These simulations offer learners an audience that is always available and easy to organize with. Continual use of these simulations has been researched thoroughly to ascertain the benefits of presenting in a virtual world.

- VR simulations offer not only an existing audience, but also one that can give feedback based on eye tracking, motion tracking, speech rate and more (Ginkel, 2019).
- Virtual VR presentations are still difficult to integrate into a more traditional educational space and therefore require their own lab or workshop.

Meaningful Contact (Humanity)

Defining

Meaningful Contact can be interpreted as an important and meaningful connection between students and teaching staff (Pijpers & Bomas, 2020, pg. 19).

Questions

How does the headset or wearables impact the communication between instructor and learner? Is the instructor inside the virtual world?

What new behaviours form in VR-based presentations? Are there habits from the headset?

Does a trainer or instructor need to be present at all VR-based trainings?

Equal Opportunities (Justice)

Defining

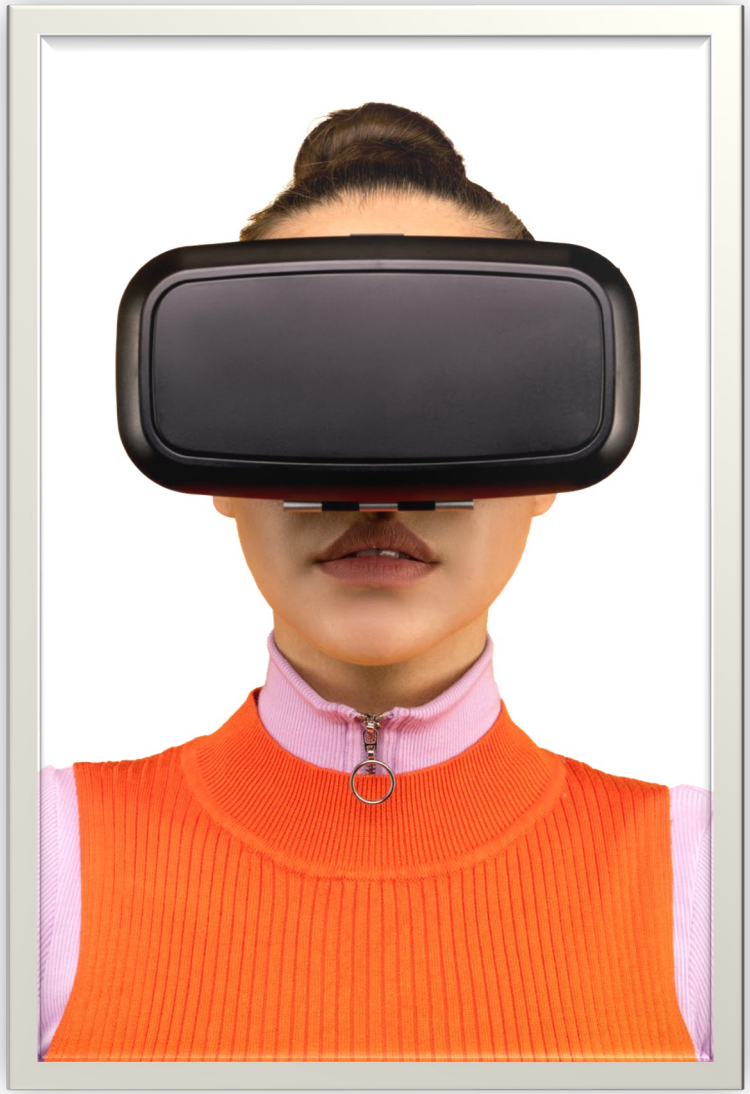
Equal opportunity may be concerned with educational institutions offering equal opportunity to all students, without disadvantaging or excluding specific groups (Bok et al., 2021).

Questions

Can agreements be made to share simulations between institutions?

What kind of opportunities do students see in the future with virtual reality for presenting?

Are our simulated presentation trainings developed with pedagogy in mind? If yes, what are those pedagogies?



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Safeguarding Of Private Life And Personal Data (Autonomy)

Defining

One component of autonomy in education is the ability to safeguard personal life and personal data; where learners and educators know their privacy is ensured when they use digital resources of their institution (Bok et al., 2021).

Questions

What data is necessary for proper feedback? How is this communicated to a learner?

If taken away from an institution, will the cameras of the headsets record the spaces of the learner? Who will have access to that data?

What current challenges does VR-based labs resolve for students and are there other technologies that could be viable instead?

Three Key Takeaways so far…

Learning in VR has impact

On learner behavior, emotion, and sense of confidence.

Public Values can re-frame technical talks

More critical inquiries that both educators and researchers should consider when incorporating these emerging technologies into their respective contexts.

Responsible XR has motivation

There is a need for creating more shared understanding around the implementation of XR technologies with responsible design and application

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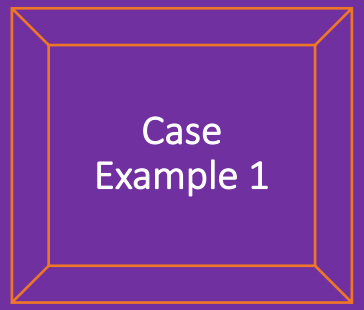
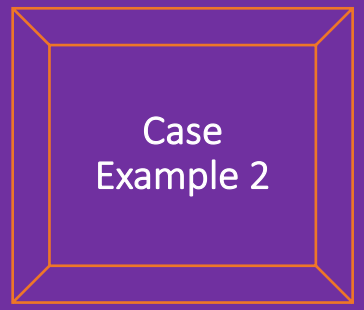
Responsible XR





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Responsible XR

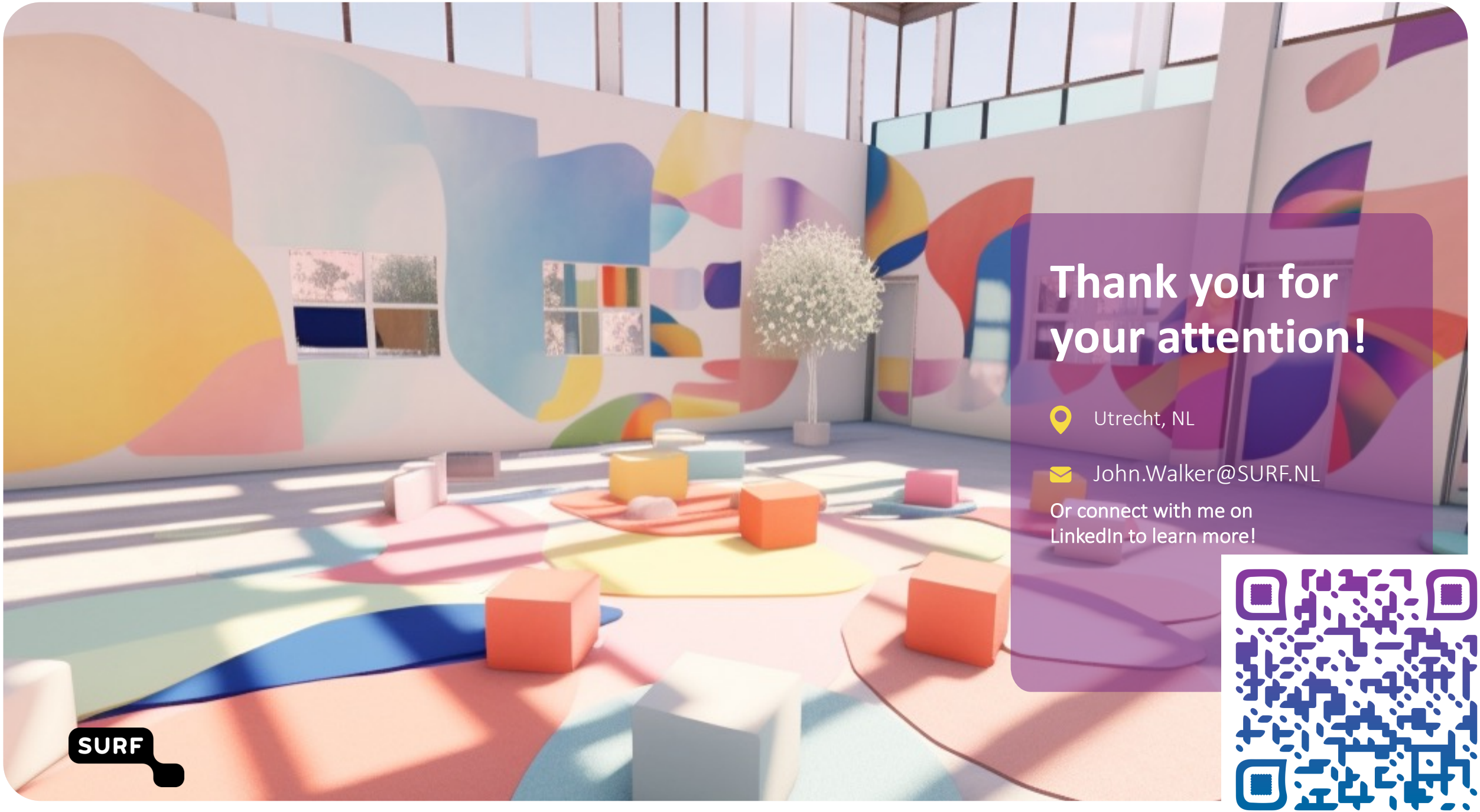
Respecting that technologies shape our daily interactions and relations to our world is one step past seeing tools as just a means to some end; a neutral tool to achieve human goals (Vallor, 2022).

Responsibility as a practice

Creating space for things like

- Critical reflection
- Consequence scanning
- Horizon building

We can create more understanding surrounding both practical and theoretical issues of new and emerging technologies in these fields without sacrificing attention to moral dilemmas and social values.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