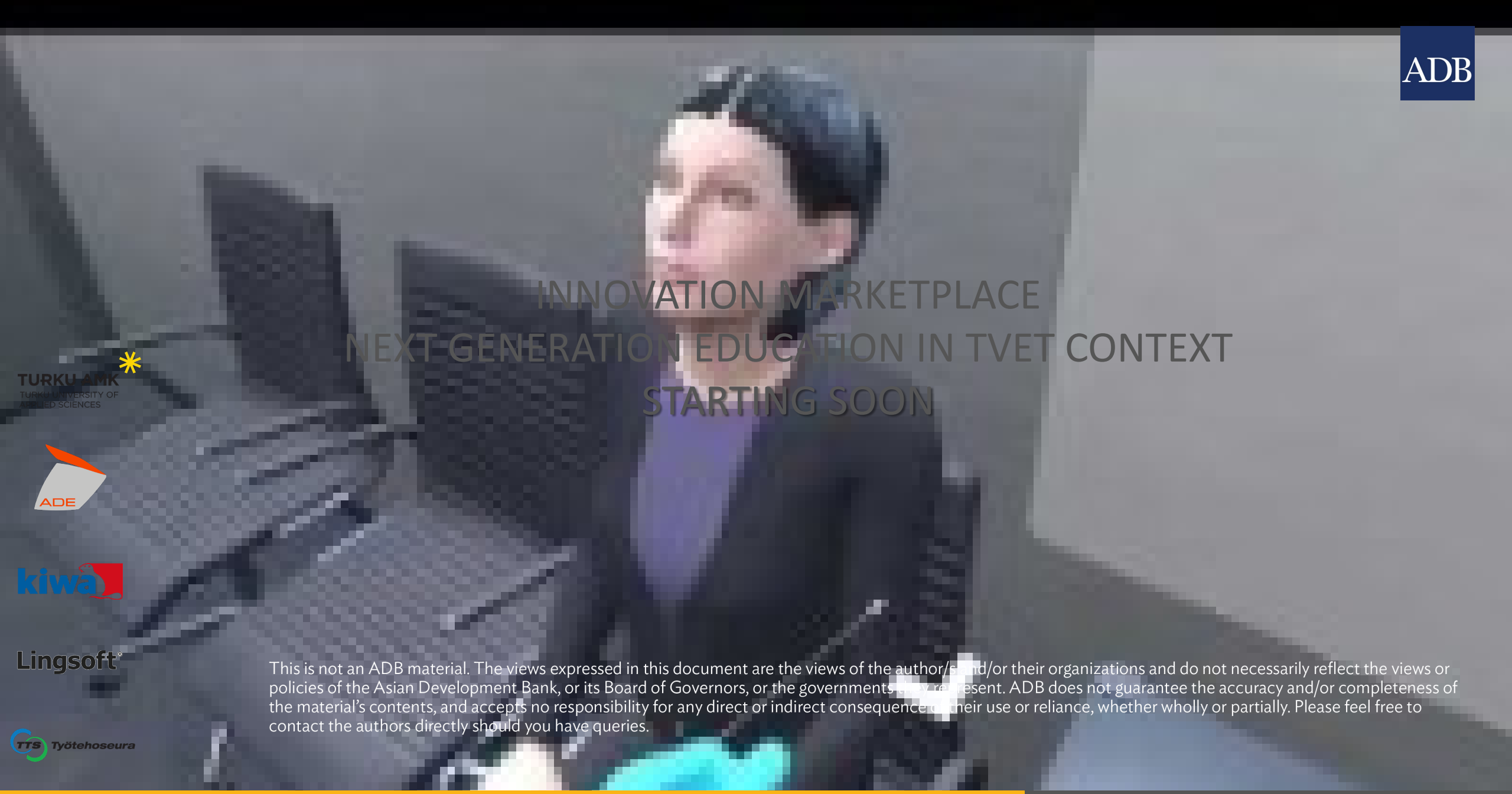

ADB

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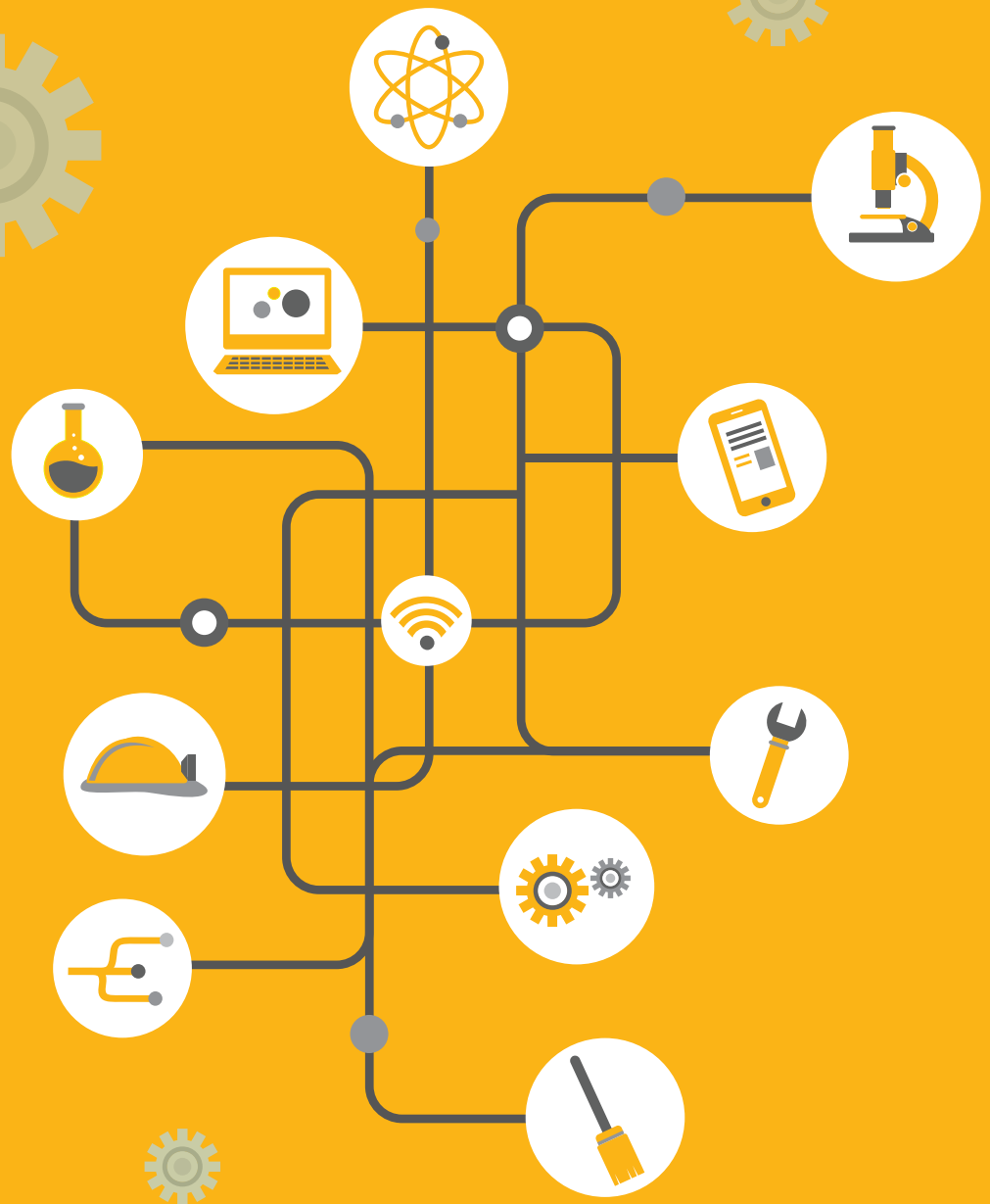
TTS Työtehoseura

23 August 2021 • 1–5 p.m. (Manila time)
24 to 27 August 2021 • 2–6 p.m. (Manila time)



ADB

9th International Skills Forum

Reimagining Education and Skills Development for a New Normal

23 August 2021 • 1–5 p.m. (Manila time)
24 to 27 August 2021 • 2–6 p.m. (Manila time)

Next Generation Education in TVET context

Dr. Mika Luimula | Maarit Pihl | Ossi Tuusvuori | Teemu Lähde

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Mika Luimula

Dr. Mika Luimula

Research Group Leader
Turku University of Applied Sciences

Dr. Mika Luimula works as a Research Group Leader of Futuristic Interactive Technologies and as a Principal Lecturer of Game and Interactive Technologies for Turku University of Applied Sciences. He holds a PhD in Information Processing Sciences and an MSc in Mathematics. He also holds an Adjunct Professorship at the University of Turku. In addition, he is a senior advisor to the board of Ade Ltd. His research interests include gamification, serious games, virtual reality, augmented reality, health informatics and location-aware systems. He has published around 130 scientific papers and his research group has won various awards in the abovementioned research areas.

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Speakers

Dr. Mika Luimula, Research Group Leader
Turku University of Applied Sciences

Award winning research projects in virtual training

Maarit Pihl, COO
Kiwa Inspecta / ADE

Over 4500 TCI specialist all around the world

Virtual training episodes since 2004

Ossi Tuusvuori, Senior Advisor
Lingsoft

Wide range of linguistic professionals in tens of countries globally

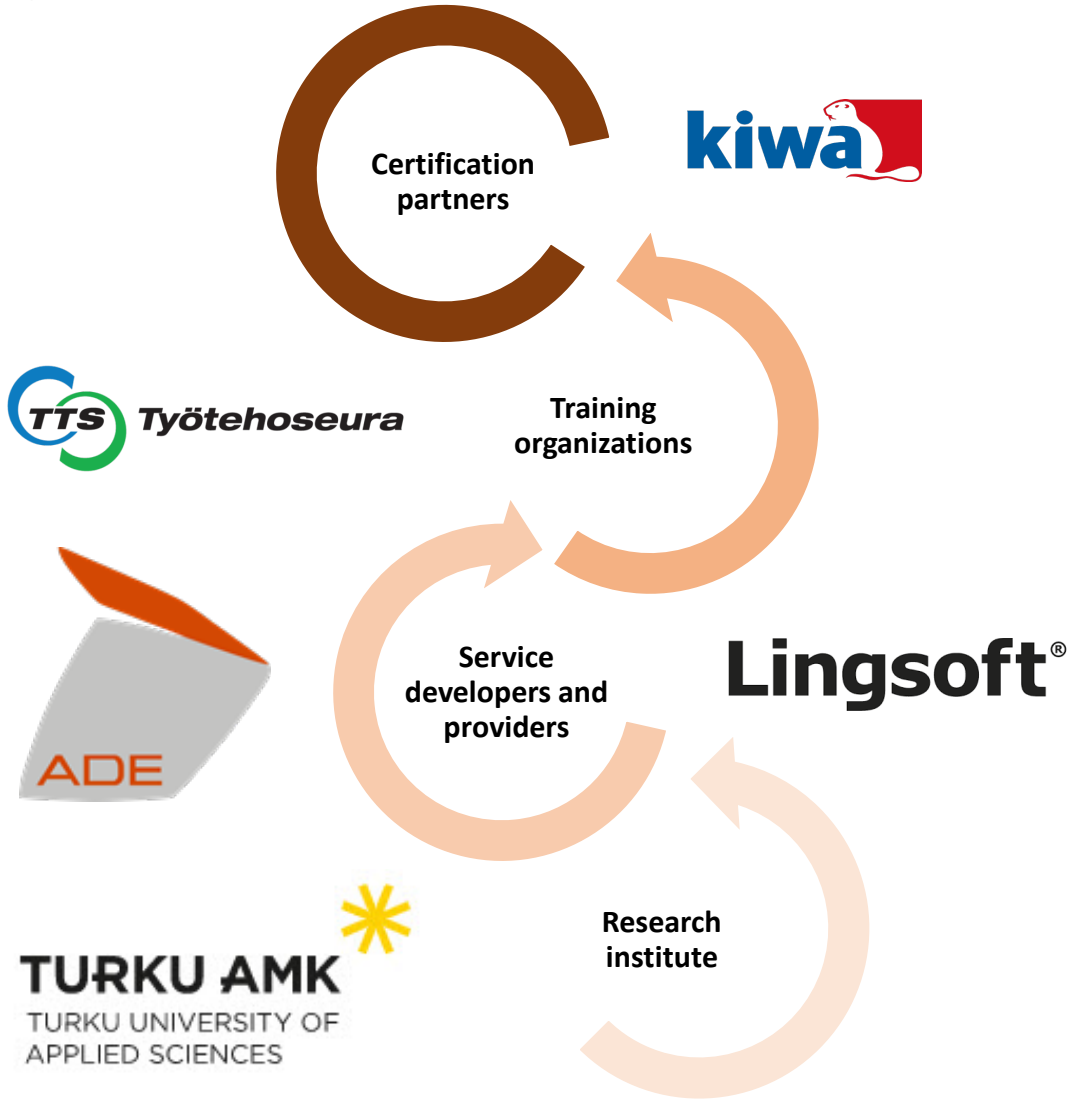
Teemu Lähde, Development Manager
TTS Development

Finnish pioneer in virtual pedagogy

Next generation education made in Finland

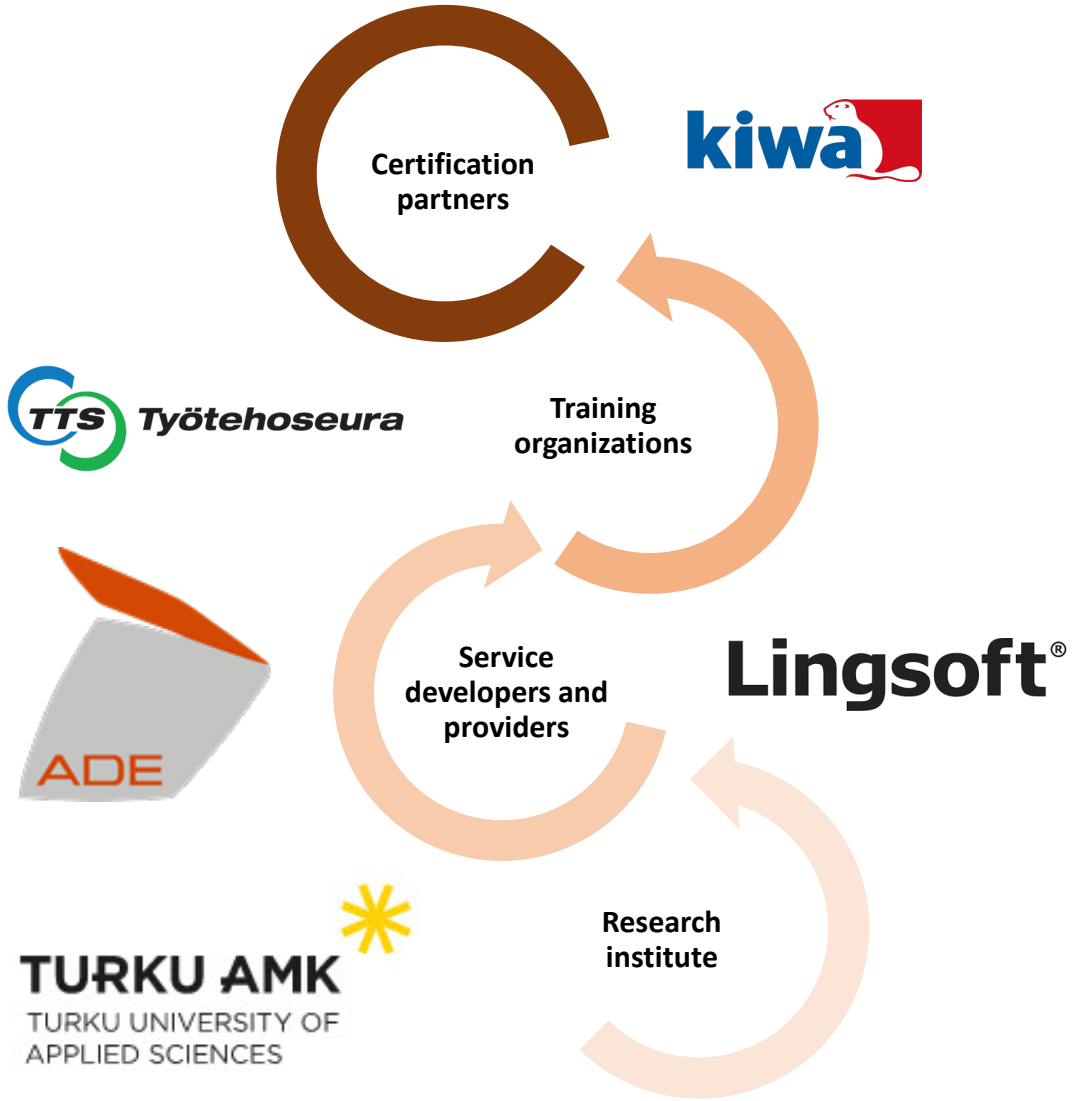
- Multidisciplinary consortium to build new generation virtual education
- Involved a wide range of professionals from different fields:
  - Pedagogies
  - Psychologies
  - Certification experts
  - TVET specialists
  - Game designers
  - Programmers
  - Computer scientists
  - Graphic designers
  - AI specialists

We can bring this same education development model to ADB Developing Member Countries (DMC) in mutual co-operation with local partners.



Global needs in education

- New tools for teachers
- Lack of teachers, an urgent need for digital solutions
- Gender equity in education
- Sustainability, decreasing a need for traveling
- Effective learning methods
- Cost-effective learning methods
- Multilingual content
- Labor mobility, demands for continuous education
- Skill gap analysis
- Standardized competence recognition



What is needed to build next generation educations?

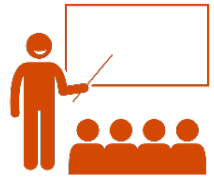
1) Management **group experts**: vocational teachers, certification, law, pedagogy, technical, etc.

2) **Analyzing local** official regulations, laws, certifications and pedagogy requirements. Creating cross-tabulation.

3) **Creation** of VR and Web **training environment**, e-leaning theory materials, gradings and test methods and environments. Localization and linguistic accessibility.

4) **Validating trainings** with teachers and certification body based on cross-tabulation of requirements.

5) Documentation and implementation into **learning management systems**.



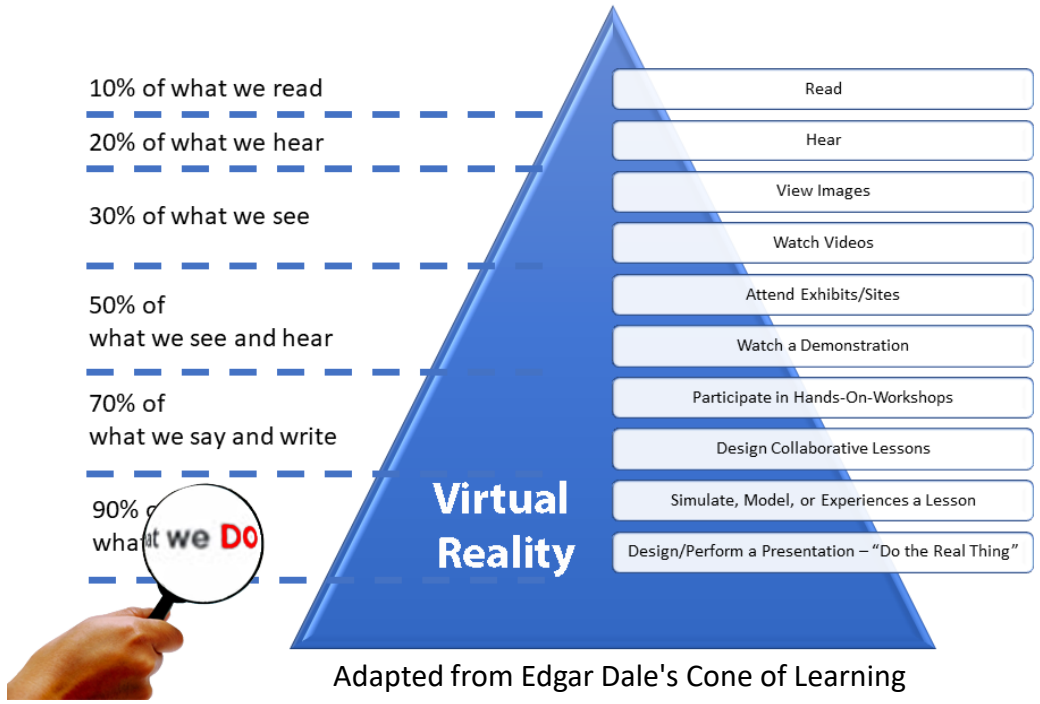
Benefits of Virtual Education

For students

- Interesting way to learn (incl. gamification)
- More practical training hours (cf. Cone of Learning)
- Safe environment for training (e.g. fire escape)
- Gender equality

For teachers

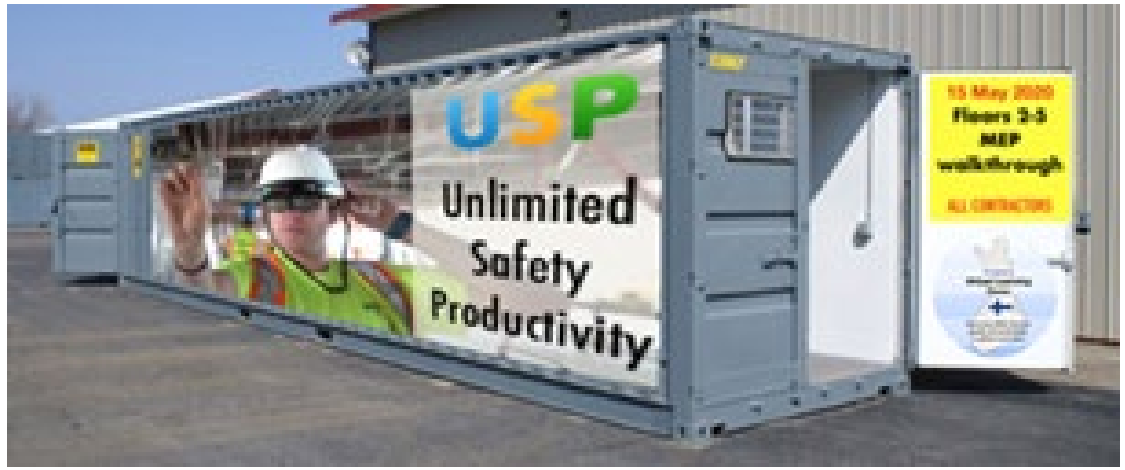
- Easiness of grading and learning recognition (e.g. European Hot Work Certification)
- Competence identification
- More efficient training sessions (incl. Multiplayer functionalities)
- Readymade training episodes, less preparing for lessons, frees resources from routine work



Adapted from Edgar Dale's Cone of Learning

Green and sustainable way to learn and educate

Benefits of Virtual Education



Luimula et al. (2020) Unlimited Safety Productivity - A Finnish Perspective Using Virtual Learning Methods to Improve Quality and Productivity in the Construction Industry

For educations facilities

- Cost savings (e.g. traditional simulators)
- Better management of resources
- Standardized grading and reporting
- Risk to damage equipment is reduced
- Modern continuously developing education tools
- Possibility to organize training sessions which are difficult and expensive to organize in real life (incl. portable training centers)

Green and sustainable way to learn and educate

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Turku University of Applied Sciences

ADB

- Futuristic Interactive Technologies (FIT)
  - the research group focusing on virtual and augmented reality, serious games, and gamification
  - during years 2019-2021, FIT has achieved various international academic awards in research areas of virtual training and mobile augmented reality
  - FIT is an active member in various international project consortiums (e.g. H2020, Erasmus+, Business
- As a research organization
  - we are interested in joint research activities
  - possible cooperation covering rapid prototyping, user centric design, and effectiveness studies
  - We are also interested in research, teacher and student exchange

Turku Game Lab

Running since 2009

Our learning environment for our students – focus on entertainment

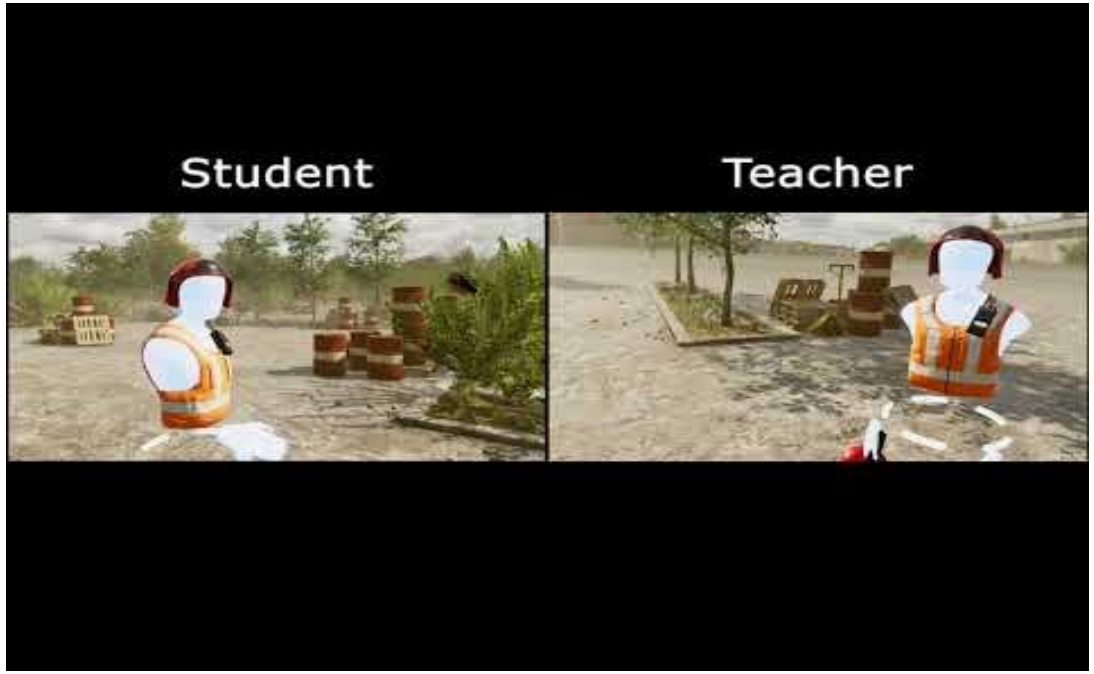
FIT Turku Competence Center

Opened in the spring 2021

A joint competence center for companies, research organizations and public sector

Turku University of Applied Sciences

- We have own Virtual Training Center
  - possible to study European Hot Work Certification
  - test environment for effectiveness studies
- In our Virtual Training Center
  - developing hands-on-training episodes with multiplayer functionalities
  - teacher coaching various trainees



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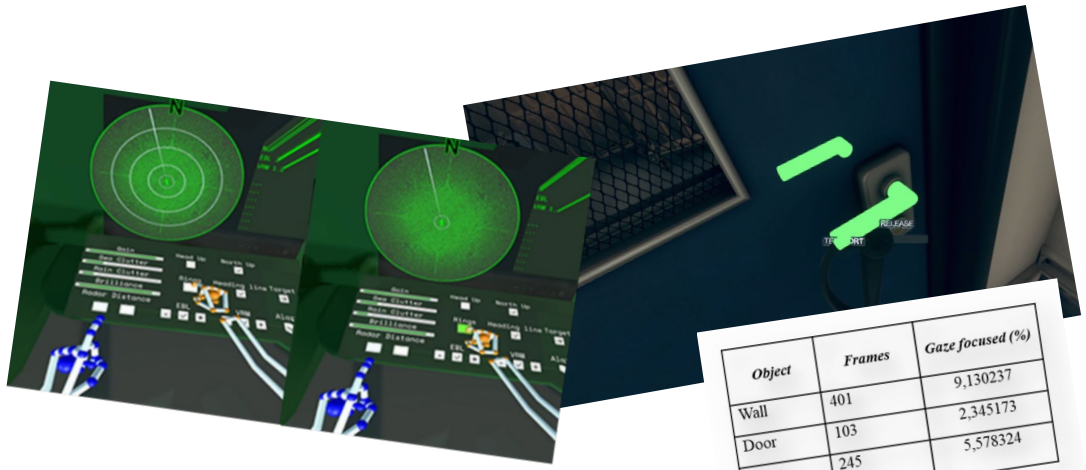
- Virtual Training Center is equipped
  - with the latest interactive technologies
  - to track and trace human behavior (e.g. eye tracking, bio sensors)



Object	Frames	Gaze focused (%)
Wall	401	9,130237
Door	103	2,345173
Door handle	245	5,578324

Frame	CaptureTir	LogTime(S	HMDPosit	HMDRotat	GazeStatu	Combined	Combined	LeftEyeSta	LeftEyeFo	LeftEyePos	LeftEyePu	RightEyeSt	RightEyeFc	RightEyeP	RightEyeP	FocusDista	FocusStab	GameObje
11342	1E+18	19	(-1025.455	(55.139, 1	VALID	0.0677930	0, 0, 0	VALID	0.0865885	-0.031853	(0.1638583	VALID	0.0489607	0.0318530	0.1924257	2	0.2980078	Door_Han
11345	1E+18	19	(-1025.461	(55.028, 1	VALID	0.0630068	0, 0, 0	VALID	0.0811125	-0.031853	(0.1619642	VALID	0.0448694	0.0318530	0.1899812	2	0.4521821	Door_Han
11348	1E+18	19	(-1025.462	(54.843, 1	VALID	0.0603870	0, 0, 0	VALID	0.0790511	-0.031853	(0.1630046	VALID	0.0416919	0.0318530	0.1907337	2	0.5342962	Door_Han
11352	1E+18	19	(-1025.463	(54.492, 1	VALID	0.0595688	0, 0, 0	VALID	0.0786262	-0.031853	(0.1629936	VALID	0.0404800	0.0318530	0.1920393	2	0.5819359	Door_Han
11355	1E+18	19	(-1025.464	(54.233, 1	VALID	0.0605883	0, 0, 0	VALID	0.0801675	-0.031853	(0.1653077	VALID	0.0409771	0.0318530	0.1929839	2	0.5826062	Door_Han

Luimula et al. (2020) Eye Tracking in Maritime Immersive Safe Oceans Technology

- Virtual Reality Social Platform (VRSP)
  - we have experiences organizing events in VRSP (e.g. Microsoft AltspaceVR)
  - can be seen as a precursor for metaverse
  - started own technology development

Luimula et al. (2021) Avatar Based Multiplayer Functionalities in Next Generation Communication and Learning in Virtual Reality Social Platforms – Case MarISOT Room

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Turku University of Applied Sciences

ADB

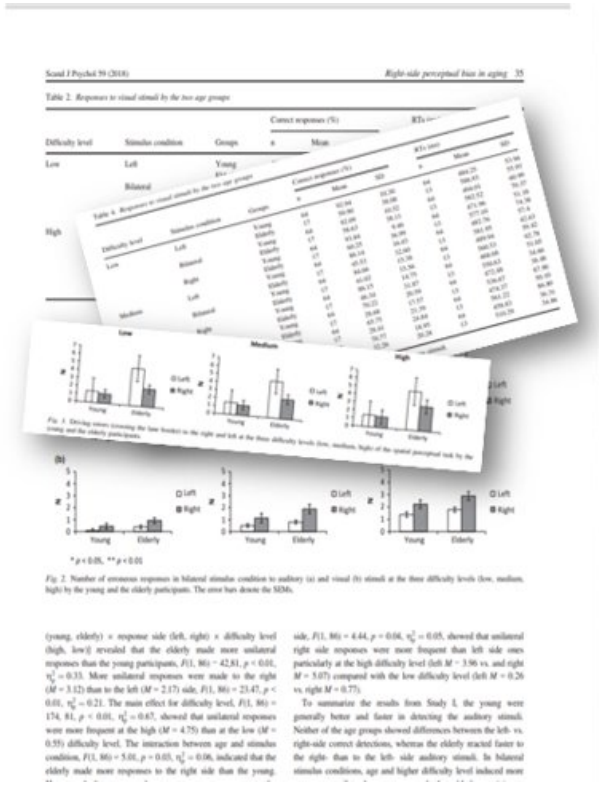
Is Virtual Education effective?

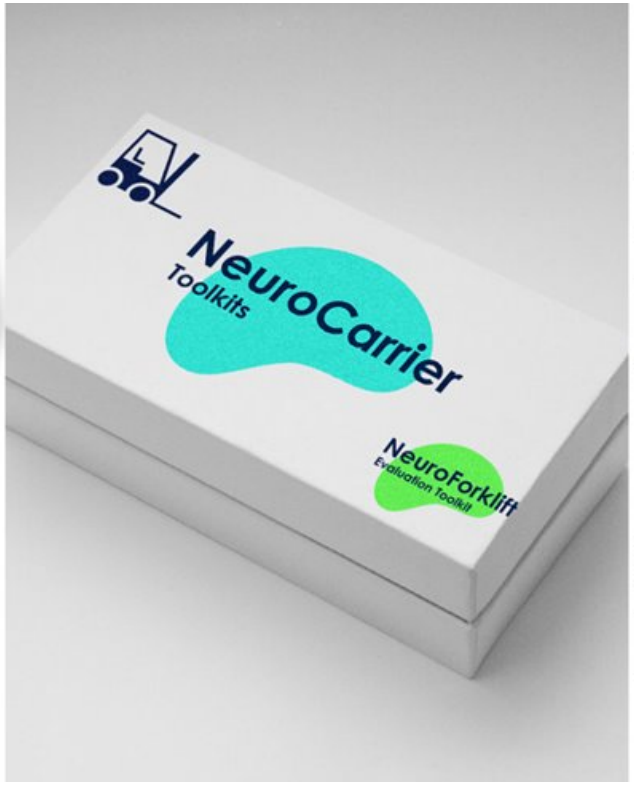
Virtual training engages and builds self-confidence.

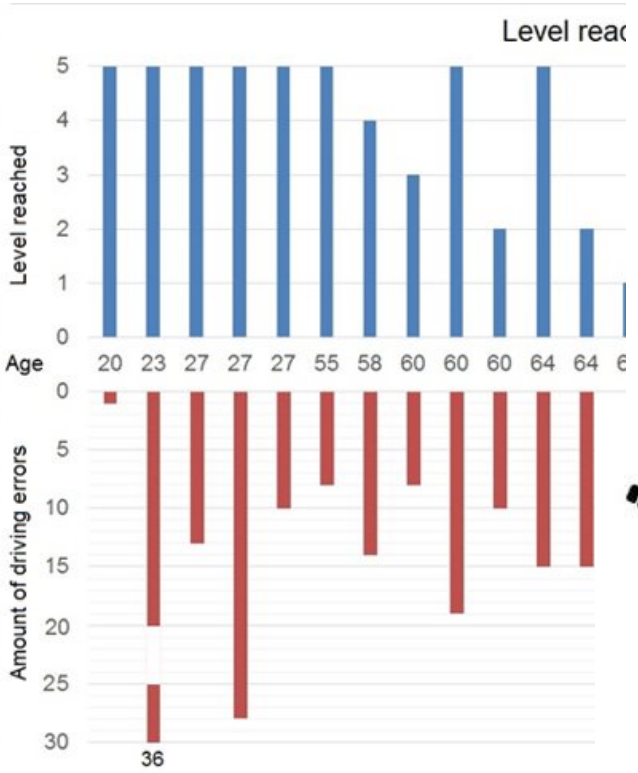
- 4 x times faster way to learn than classroom training.
- Engagement. Students' emotional connection to virtual education content is 3.75 times better than the connection to classroom teaching content and 2.3 times better than the connection to the content of online teaching.
- Trust. After virtual training, students feel 275% more confident when working with a learned topic. The trust gained through virtual education is 39% better than that gained through classroom teaching and 35% better than the trust achieved through online teaching.

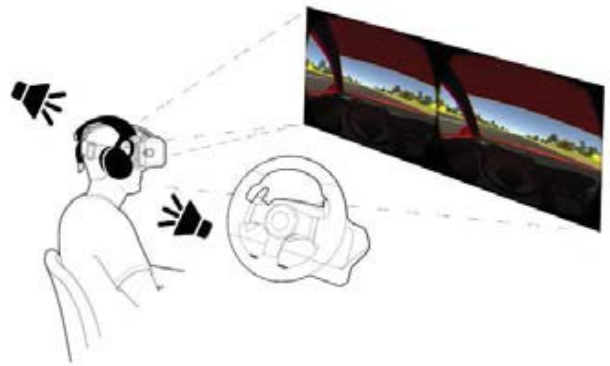
PwC (2020) VR Soft Skills Training Efficacy Study

Our Research Activities - Virtual Reality in Driving Inspection









Hämäläinen et al. (2018) The Right-side Perceptual Bias in Aging Determined in a Laboratory and during a Virtual Driving Task

Izullah et al. (2021) Differential Interactions of Age and Sleep Deprivation in Driving and Spatial Perception by Male Drivers in a Virtual Reality Environment

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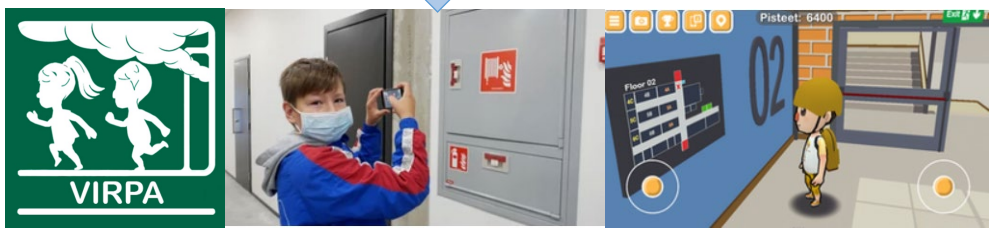
Our Research Activities - Hazardous scenarios in Virtual Reality

ADB

1) VR solution to test behavior in fire escape
2) Result: School kids not able to navigate
3) AR solution to teach safety symbols
4) Testing AR in autumn 2021 – participants also from Asia?

Download on the App Store

GET IT ON Google Play



https://www.virpagame.fi/?lang=en

Oliva et al. (2019) Virtual reality as a communication tool for fire safety – Experiences from the VirPa project.

Maarit Pihl

Chief Operating Officer and Business Unit Manager
Kiwa Inspecta Finland

Maarit Pihl works as a COO and business Manager for Kiwa Inspecta Finland. Maarit has worked in the training industry for more than a decade and during this time has been involved in multiple development programs, where the latest findings on learning studies have been taken in to practice in the business sector. During the recent years her focus has been in the digital solutions and interactive technologies.

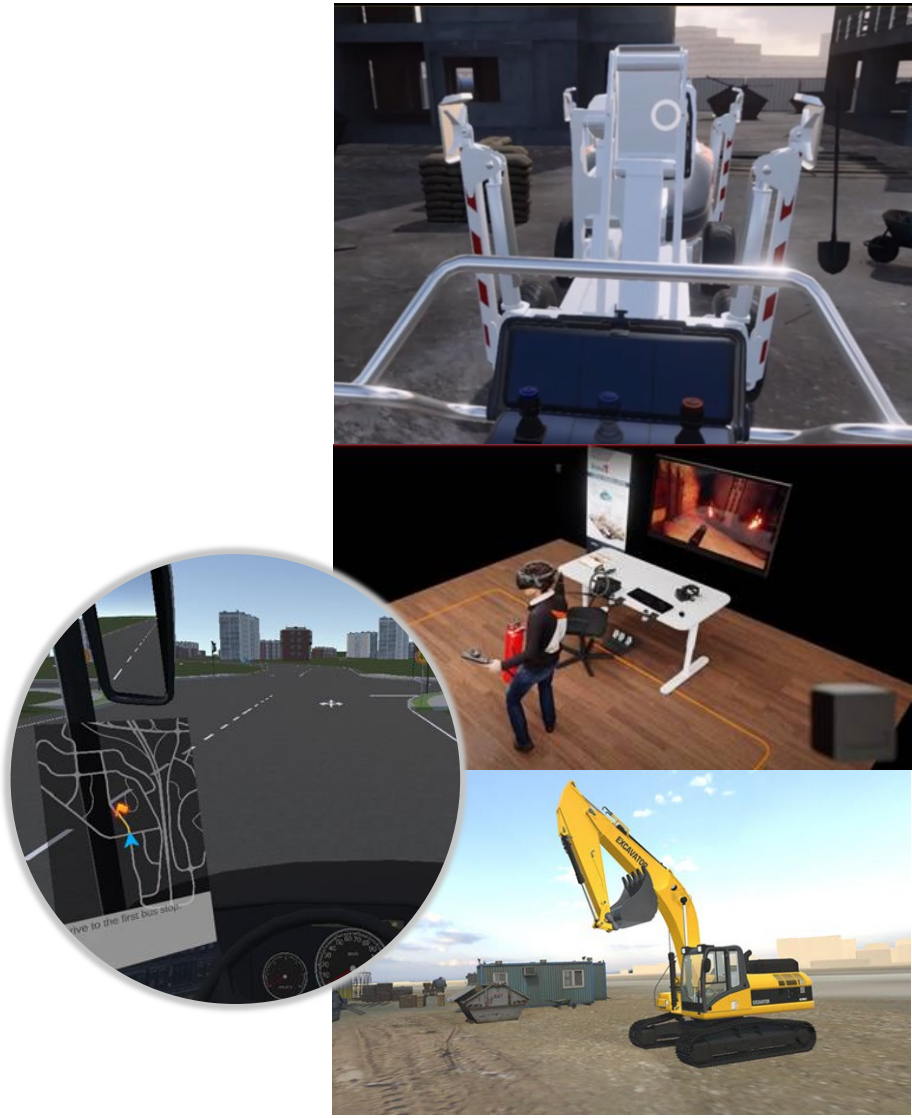
Maarit Pihl also representing ADE Oy behalf of Pasi Porramo, CEO in this event.

- Creating trust in international markets
- A world top 20 leader in Testing, Inspection and Certification (TIC).
- Complete TIC portfolio, including training, data and consultancy services. Training services include a wide library of elearnings
- Expert services in areas such as building materials, oil, gas & chemicals, management systems, transport & mobility, retail, agri-food and utilities.
- Over 5,500 professionals in 35 countries
- Combined turnover about 500 MEUR

- Finland based high-tech software company, founded in 2000
- Leading provider of virtual reality since 2004: specializes in developing educational virtual reality environments, interactive web360 content, animations and customized CPQ solutions.
- Expertise of thousands of projects
- The world's first simulator-based competence assessment system
- Reliable partner with wide partner network
- Sister company proving virtual surgery planning solutions (www.surgeryvision.com)

ADE Virtual Education

- Intelligent *ISOVELI*-platform
- Wide continuously growing portfolio of hands-on trainings for logistics, health care, warehouse work, forestry, gardening, construction, safety training etc.
  - Real VR, light VR
  - Web 360 materials
  - AI-based social interaction exercises
- Ade uses 3D and 360 technology in animations and interactive web contents. AR / XR technology has been piloted in several projects.
- Trainings are based on eRequirements of the Finnish National Agency for Education.
- ADE licenses these trainings to vocational institutes, education providers and corporations and has created over 2000 tailored animations for companies.



Training centers with authentic experience

ADE provides training centers with accurate physics modeled simulators and add-on equipment.

One of a kind authentic smart controls

- e.g. Patent pending fire extinguisher control with various sensors such as pin removal and foam monitoring

Social interactions

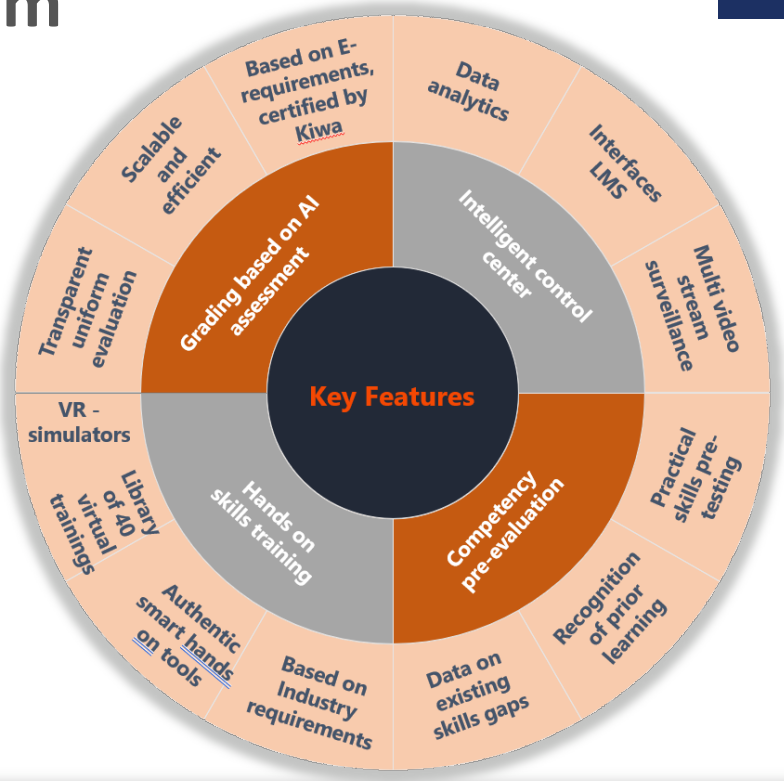
- AI-based speech-to-speech episodes, linguistic

https://virtualtrainings.ade.fi

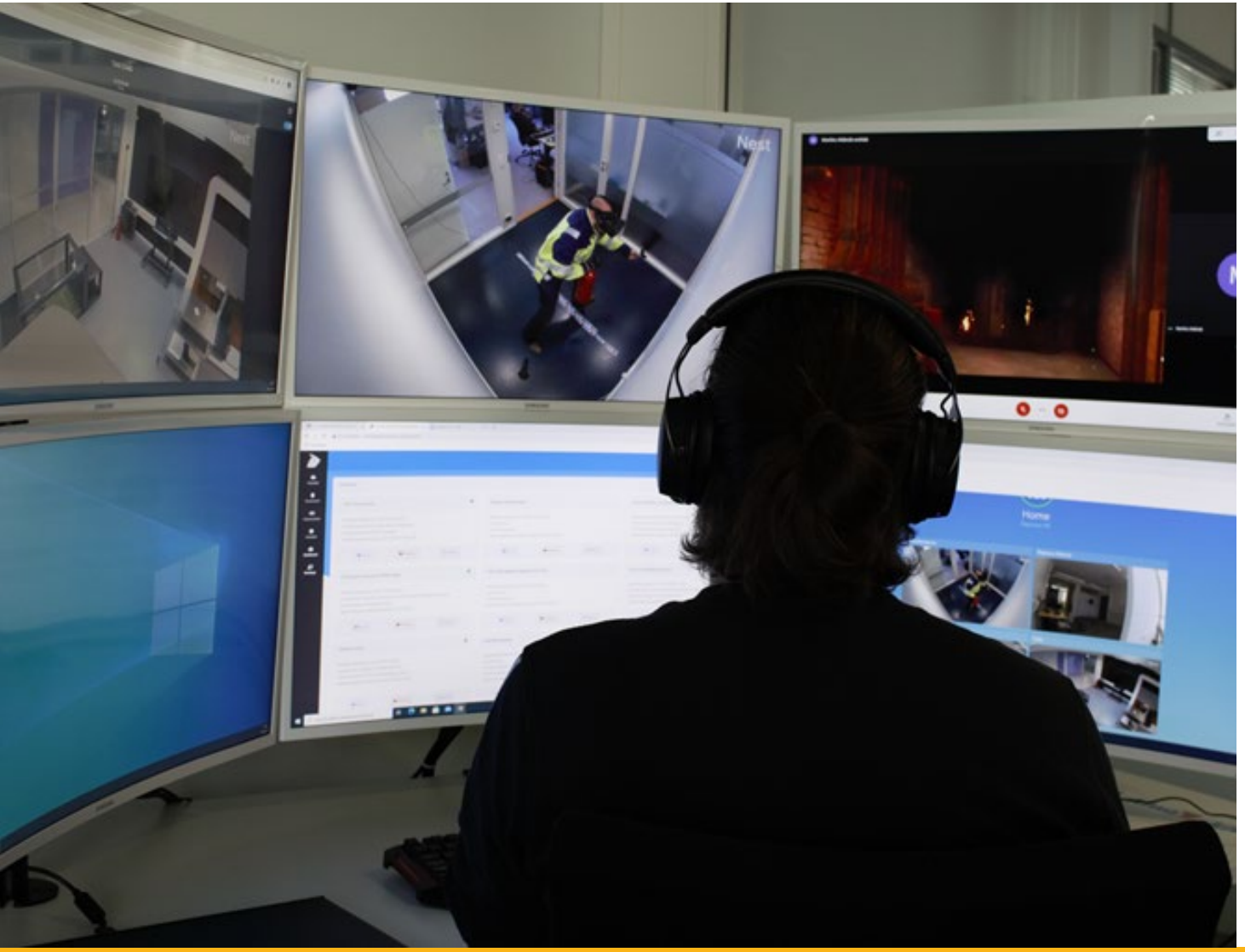
Intelligent Isoveli – platform

Trainings are distributed via intelligent Isoveli – platform

- Cloud-based Saas service, easily scalable
- Trainings library (VR trainings, videos, animations, interactive 360 web contents etc.)
- Measurement and assessment of competence
  - Performance monitoring
  - Competency pre-evaluation
  - Grading of trainings based on AI assessment
  - Remote monitoring
- Data analysis on for example skills gaps
- Integrations into LMS and other systems



Remote monitoring and competence assessments



- With the help of AI and remote monitoring, a large numbers of employees or job seekers can be screened efficiently at any location
- Simulator-based pre-screening of skills and mapping of existing skills and gaps
- The AI component assesses how the learner performs and transparently evaluates the outcome
- Kiwa's surveillance rooms for remote monitoring to validate the practical test for certified qualifications and provide technical support.

Theory as e-learning to support Virtual hands-on trainings

Wide library of vocational and qualification e-learnings available

Ossi Tuusvuori

Ossi Tuusvuori

Senior Advisor
Lingsoft Ltd.

Ossi Tuusvuori (MSc) has longstanding working experience in global (UN, WTO, UNESCO, OECD, etc.) , regional (EU, EFTA) and national Finnish trade policy and international politics an d diplomacy,, research & development, education and cultura l heritage related projects, research activities on internationa l politics and history, integration policies, public-private partnerships.

He has been working as Lingsoft Senior Advisor since 2008.

Lingsoft®

Lingsoft

- Lingsoft (est. 1986, parent company Lingsoft Group) is one of the leading privately owned companies in its field in Europe with an extensive range of language services and language technology solutions, offering a variety of services and solutions for the analysis, processing, production and management of spoken and written language (e.g., Machine Translation, Speech Recognition & Speech Service App)

- Its own language technology and extensive R&D is based on global 2-level morphology standard. Lingsoft has collaboration in Europe and globally (e.g., with Microsoft and IBM). Lingsoft is the only Finnish company included in Nimdzi report on the world's hundred biggest language service companies for 2021 .

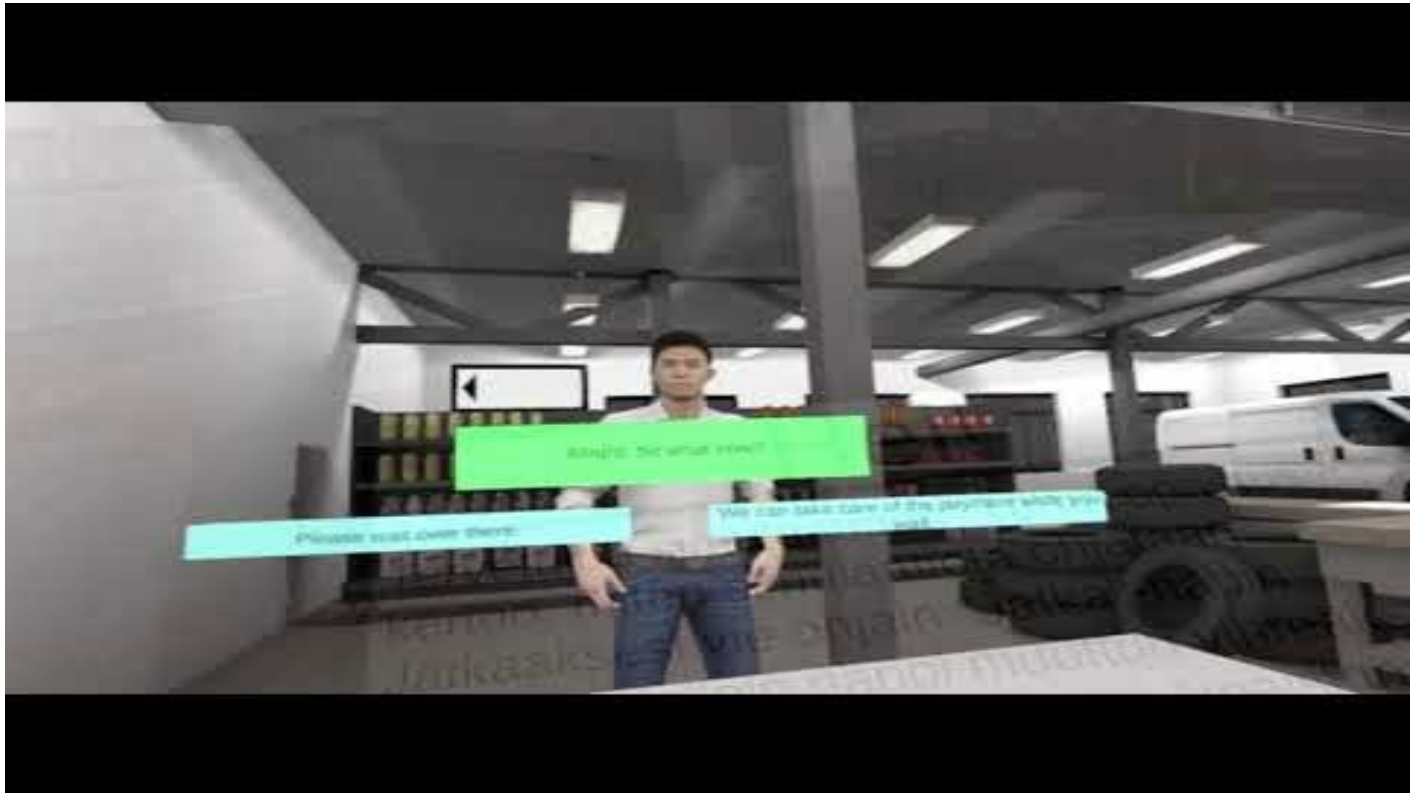
- A broad set of NLP for both text and speech with 35 years of experience of new NLP (neural language processing) development. Scalable and language-independent solutions with easy extension to new languages.

Lingsoft

- "Own language, own mind" . Everyone has the right to use, learn and to be understood in his or her own language - including all underserved and indigenous languages - whether in real or in virtual life.
- Supporting social practices and linguistic accessibility in Virtual Reality and in all educational services
- Extensive variety of language services (e.g., Machine translation, Localization, Speech service, Terminology management, eBook and eLibrary services) solutions available for Next Generation Education in TVET context
- **Our Vision: Linguistic Accessibility and Semantic Virtual World**

Lingsoft

- Our experiences of virtual training
  - A lot of needs for soft skills training with multilingual versions
  - We have successfully integrated speech-to-text, text-to-speech, and chatbot functionalitieis in virtual training episodes in a close cooperation with our partners



Lingsoft®

Teemu Lähde

Teemu Lähde,
TTS Työtehoseura ry

Development manager, vocational training and international assignments. 15 - years of experience in transport and logistics training and managerial positions as well as simulation development. Five years of experience in developing e-learning environments - mainly virtual training - for the forestry, transport, logistics and construction industries.

TTS Työtehoseura

TTS is the leading innovator of work in Finland

TTS (Työtehoseura) is an independent corporation which provides nationwide training and development services to the clients. The goal of our operation is to improve the economic efficiency and work safety.

TTS is one of the biggest and oldest private organizers of vocational education and we train approximately 8000 students a year for a variety of professional occupations.

TTS brings education and research together

We are the first educational institutions in Finland who actively develop practical VR training for customers' needs in vocational education.

TTS Työtehoseura

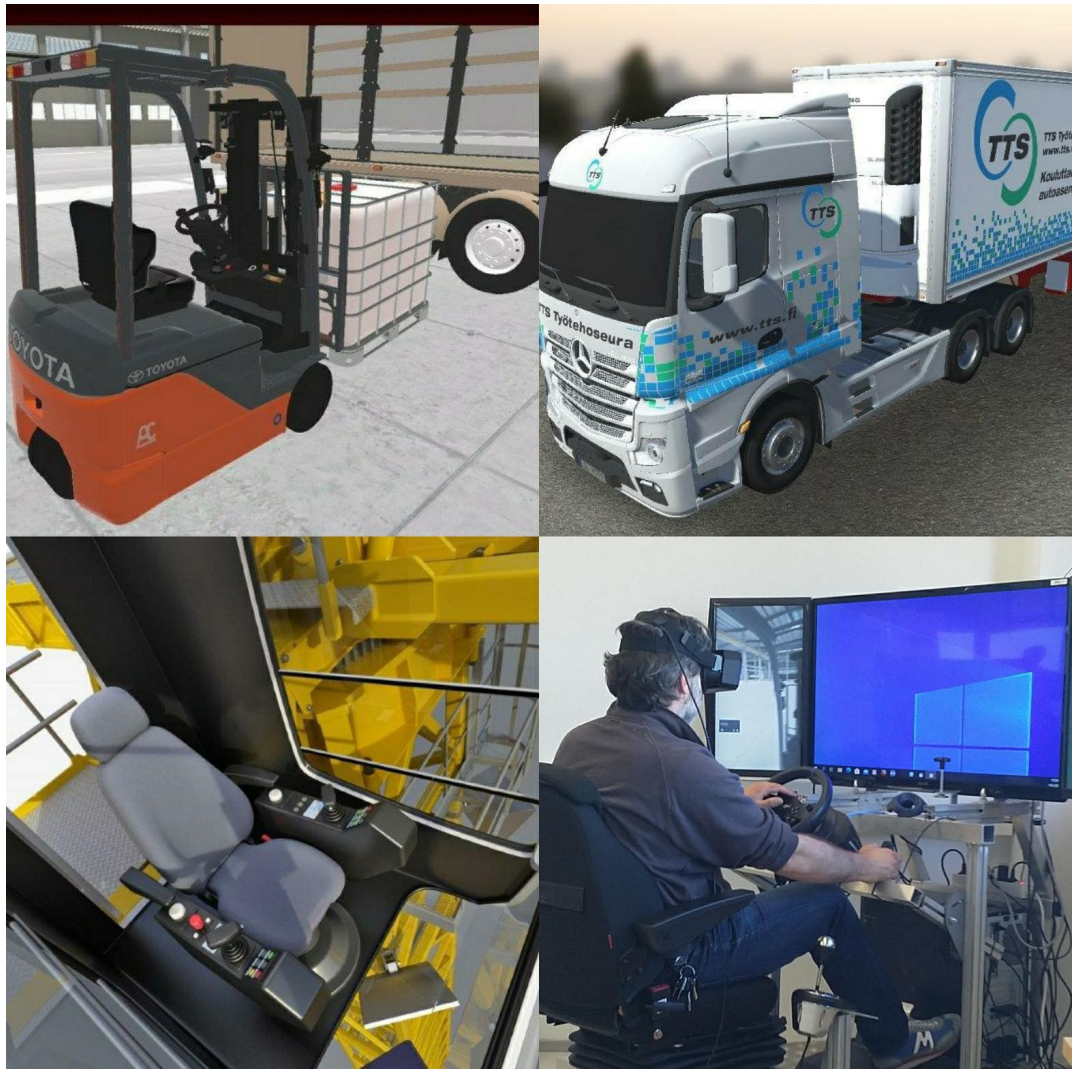
Our state of mind

- Invest in practical training
- Create a work-based processes from individual practical trainings
- Find the right uses for virtual environments
- Focuses simulations on a single platform
- To create a national / international framework for the practical studies of vocational education
- Develop one standard environment which can practice as many different professions as possible

TTS Työtehoseura

Together, with the consortium we have developed a virtual working environment that is growing into new areas.

The environment is unique to vocational training needs and saves equipment and staff costs really effectively.



Mika Luimula

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Turku University of Applied Sciences

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We open for collaboration with ADB and DMC's

Possibility to develop ADB tailor made web portal to distribute and localization next generation educational content to their members countries (DMC) together with us and partners in local destinations in Asia.

- Intelligent *Isoveli* – platform
- VR training materials
- E-learning materials
- Material localizations and customizations (linguistics, certifications, etc.)

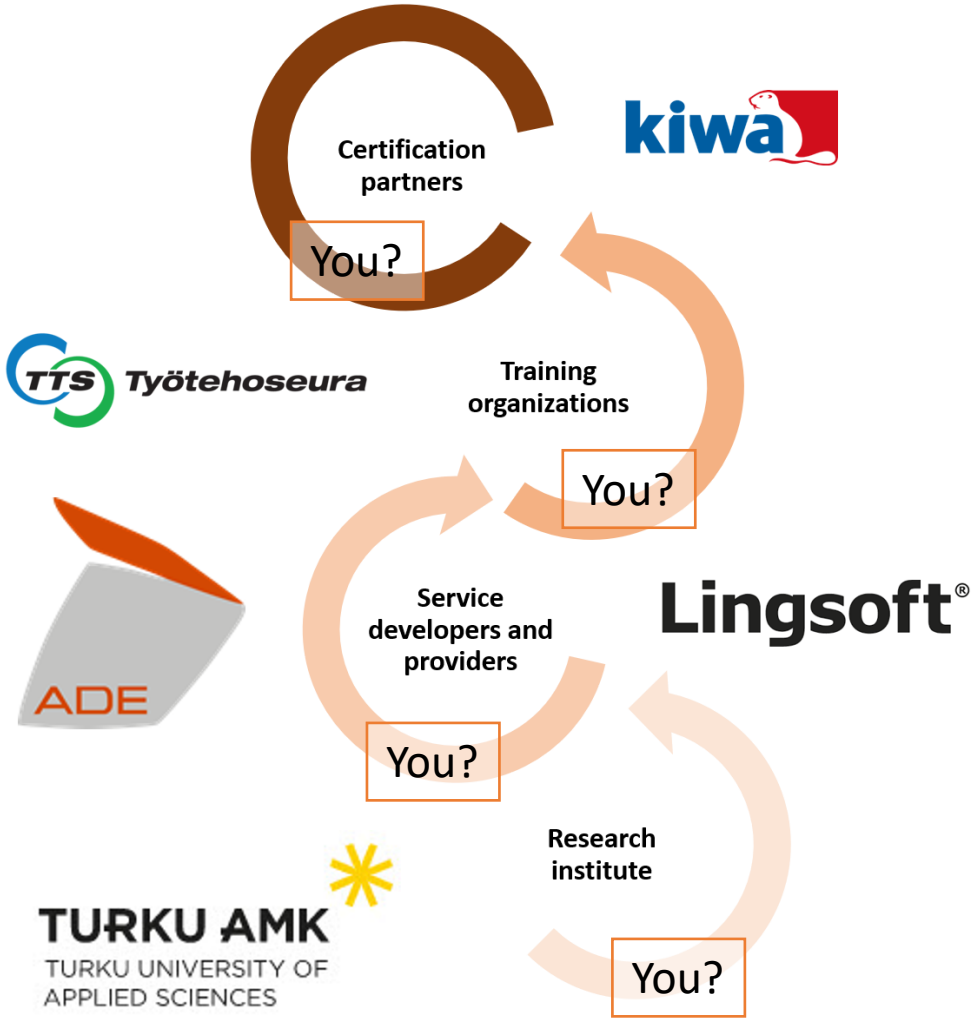
- Research collaboration in chosen focus areas. (e.g. usability, user experience, effectiveness studies, etc..)

- Partner network available for joint R&D projects

We welcome you to be partner in any position

- Be a pioneer and collaborate with us to develop next generation education at your region with local regulations, laws and linguistic.

- Early birds have great opportunity to distribute their educational content along with us to other regions.



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https://www.tts.fi/en/tts

Thank you for your attention.

We are looking forward fruitful cooperation.

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