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School as an innovation platform - a unique model for co-creation. The Finnish Smart Learning Environments for the Future project.

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Co-creation allows products and services to be refined to better respond to the needs of the user. This article describes some of the results of the Smart Learning Environments for the Future-project showcasing examples of how schools and companies have been co-creating educational products in Finland.

THE FINNISH SMART LEARNING ENVIRONMENTS FOR THE FUTURE-PROJECT

The ongoing change in education has created a need for building new, user-centric and sustainable learning environments. This development is giving ed-tech companies possibilities to develop the kind of learning environments that schools and higher education institutes need, based e.g. on the new national curriculum, reform of the vocational education system in Finland and digitalization. The new curriculum in Finland emphasizes transversal competences, phenomenon-based learning, versatile learning environments, the active role of students as learners and school's interaction with the surrounding society as well as utilizing the latest technology in supporting learning and teaching. **This article describes some of the results of the Smart Learning Environments for the Future-project showcasing examples of how schools and companies have been co-creating educational products in Finland.**

The benefits of co-creating learning environments are many. The companies creating services and products for learning need cities and R&D organizations as their partners to be able to develop solutions which genuinely serve the users' needs. The cities can open their learning environments such as schools and the entire city for user-centric co-creation process. Ed-tech companies' possibilities for growth and internalization are improved significantly when they get to develop their products with learning-experts and the end-users of their products. The co-creation process of smart learning environments with companies and cities is also helping the HEI's increase their knowledge and skills in creating learning environments which support students learning. The cities' and companies can also use this

increased knowledge in validating their solutions. However, for this kind of company collaboration, an **operations model** is needed, which defines the roles, responsibilities and benefits for each partner. The model needs to be tested as well.

The problem with educational products at the moment might be that teachers may not know what kind of products and services are available and on the other hand the companies may not know about the needs of the students and teachers. The Smart Learning Environments for the Future project offers an excellent opportunity for companies to **develop their products in collaboration with users**, namely students and teachers. The project provides companies with an opportunity to gain valuable user experience in a facilitated manner and test their products and services in the educational institutions of Finland's largest cities, thus giving participating companies a valuable reference for the future. **The Agile Piloting programme**, in particular, focuses on developing products to address the everyday challenges faced in schools, and participating companies can often be compensated for their pilots as well. In addition, companies may be given access to the **Living Lab facilities** to be built in different cities, which also serve as platforms for co-creation. The project also contributes to the building of an **education export ecosystem**, in which schools and educational institutions serve as innovation and experimentation platforms for new business and growth. The project also organises needs-based business coaching and supports companies' opportunities in the international market.

Co-creation allows products and services to be refined to better respond to the needs of the education sector and the everyday operation of educational institutions, enabling cities to procure higher quality and pedagogically more effective learning environment solutions in the future. Teachers play a key role in this type of co-creation: having a front-row seat, they are best-equipped to see what is possible with new technology and influence how products in the education sector are being developed. Co-creation also offers pupils and students a unique opportunity to participate in companies' product development processes and thus familiarise themselves with the everyday operations of companies.

The learning environments of the future will include more and better solutions for utilising virtual and augmented reality (VR and AR), data produced by sensors, artificial intelligence (AI), 3D modelling, space analytics, immersive spaces, learning analytics, physical learning environments and digital tools in teaching and learning.

The current trends in education include e.g.

- Personalized learning (learning analytics)
- Learning outside classrooms
- Digital and virtual tools, immersive rooms, robots etc. will be integral part of everyday learning (Robots as assistants to teachers, VR, AR, immersive spaces help deepening the emotional experience of learning)

- Modern school buildings enabling new learning and teaching methods
- Focus on creative problem solving, design thinking and collaboration skills (Maker culture, STEAM)
- Teachers as coaches, facilitators and mentors

Each of the trends mentioned include the use of the latest edtech products in the market. In addition to places traditionally thought of as educational institutions – from day care centres to universities – learning is also increasingly taking place elsewhere, outside the classroom. This is why the scope of the project covers not only schools, but other learning environments suitable for development and testing as well, such as museums, libraries, green spaces and multipurpose buildings in different cities.

Teachers play a key role in this type of co-creation: having a front-row seat, they are best-equipped to see what is possible with new technology and influence how products in the education sector are being developed.



Image 1: Hiukkavaara comprehensive school (@City of Oulu)

DEVELOPING INNOVATION PLATFORMS IN THE FIELD OF EDUCATION

Objectives of the Smart Learning Environment for the Future- project are

1. New business through co-creation

The project aims primarily at creating new business opportunities for companies developing new products, services, and solutions for different types of modern and sustainable learning environments (physical, virtual as well as combinations of physical, digital, and virtual learning environments). The project gives many concrete possibilities for companies and start-ups to co-create and test their new products together with teachers and students. Companies gain valuable user experience, feedback of their products and user references. Companies also gain an insight on the needs of the users in order to start developing new products responding to these needs.

2. Higher quality learning environments for teaching and learning

The project wants to advance the development and creation of user-driven learning environments in the six largest cities of Finland. The co-creation process created by the project partners allows products and services to be refined to better respond to the needs of the education sector. Teachers are given the opportunity to influence how products in the education sector are developed. Also, the students are involved in the product development process. Making the learning environments visible, open, and accessible for all partners to develop, test and demonstrate their new solutions at is also encouraged.

3. Systematic and tested models and structures for co-creation

Before this project a shared model for this kind of testing has not existed. Each of the five cities have had their own model, if any. Therefore, a shared framework for co-creating learning environments was needed. The stakeholders involved in the project are city organisations, companies, research and education organisations, and end users. A shared framework leads to more efficient and better functioning co-operation between cities, companies, schools and R&D organisations in co-creation and product testing.

The themes for co-creation pilots were kept quite broad, because reaching as many companies as possible was important. The project is not aimed only at edtech companies. There have been e.g. companies providing furniture for schools involved in the project.

The themes of the project are:

- The whole city as a learning environment
- Smart and sustainable physical learning environments
- Learning analytics
- Digital tools and new technologies
- Virtual and augmented reality
- Product and service development environments

Goals for co-creation and testing could be

- Usability testing of MVP
- Testing an existing product in a new market area (in this case education)
- Developing the innovation platform
- Producing user-centred content and testing new solutions
- New innovations: from idea to finished product or prototype

MODELS FOR CO-CREATION AND TESTING

There are three models for co creation and testing. They all have been piloted in each of the participating five Finnish cities. Reports from pilots are available on the project website. In the reports the companies describe their pilot experiences, benefits, challenges and lessons learned. The reports might help other companies to understand the benefits of co-creating ed tech products. **Altogether over one-hundred pilots, experiments or co-creation processes have been carried out during the 2,5-year project so far.** The three models are:

1. Challenge-based
 - Agile piloting
 - Pilot procurement or “standard” pilot
 - Duration: 3-4 months
2. Customized
 - Testbed model
 - Single pilots
 - Company-driven
 - Duration: varies
3. Standalone pilots
 - Competitive tendering
 - Based on the needs of the city and ecosystem
 - Duration: varies

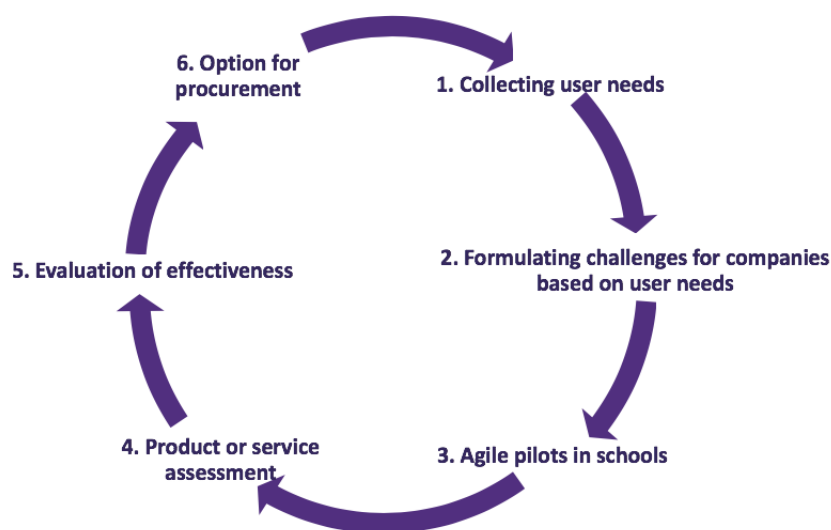


Figure 1 Co-creation process cycle

THE AGILE PILOTING PROGRAMME CHALLENGES FOR COMPANIES

The challenges were designed together with the schools' teachers. This way the need for the solutions could be ensured. Some of the challenges co-created with the teachers are listed below.

- How to develop feedback, assessment and evaluation to be more motivating and diversified in schools?
- How to find new and inspiring learning facilities outside school buildings?
- Immersion, augmented reality and virtual reality in education
 - Interaction in AR and VR environments between students
 - Students as active creators in AR and VR environments
- How can school better support the development of socio-emotional skills of students?
 - Can positive personal growth be supported by using technological solutions?
- Teaching work life skills for general upper secondary students
 - How can technology help in finding new ways of teaching work life skills for students and/or even finding a job?
- Babel Fish
 - Innovative ways of using language and translation technology in schools
- Show your skills!
 - How to make visible the skills and knowledge learned outside formal education?
- How to increase the student's physical activity during the school days through innovative solutions?
- Smart and engaging solutions for sustainable future
- New solutions for individual learning path

CO-CREATION WITH COMPANIES: WHAT'S IN IT FOR TEACHERS AND STUDENTS?

Teachers play a key role co-creation. The teachers have a front-row seat in what's happening at schools and in education today. They are best equipped to see what is possible when it comes to using new technology in the classroom. The co-creation of the ed tech products gives the teachers a possibility to influence how and what kind of products for the education sector are being developed. Teachers also gain novel expertise in new technologies, product development and collaboration with companies. This way the teachers are able to provide inspiring learning opportunities for their students. For the students the co-creation process offers a unique opportunity to participate in companies' product development processes and they also get to familiarize themselves with the everyday operations of companies while at the same time telling about their needs and hopes for educational products used in classrooms.

CO-CREATION WITH COMPANIES: WHAT IS IN IT FOR CITIES AND R&D ORGANISATIONS?

Co-creation allows products and services to be refined to better respond to the needs of the education sector and the everyday operation of educational institutions.

For R&D organisations co-creation processes provide concrete platforms to conduct research and student projects. Enabling cities to procure higher quality and pedagogically more effective learning environment solutions in the future.

LESSONS LEARNED

- Co-creation is a strategic decision. Support of leading decision makers and school principals is crucial.
- Define a clear concept and a model for co-creation. Make it as simple as possible for the companies and the teachers.
- Communication, communication, communication. Be open about the aims and methods in order to avoid any misconceptions.
- Let the teachers decide and give them tools to take an active part in the process. Trials/pilots will not succeed without motivated teachers.
- Make sure your internal processes are ready before starting the pilots. Waiting is not an option for start-ups.
- It is a joint effort, not a standard procurement. Companies need to be ready to invest their own time and money as well. A successful trial/pilot is not a guarantee for a larger procurement.
- Let the process breathe. Leave enough freedom for companies and teachers to plan and execute the pilot/trial.
- Companies expect visibility from the cities. Cities should openly promote the co-creation success stories and best practices.

6Aika, the Six City Strategy: The Smart Learning Environments for the Future is a 6Aika pilot project funded by the European Regional Development Fund. The project will continue until November 2020.

The project website (mostly in Finnish): <https://www.oppimisenuusiaika.fi>