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Quality of life - the potential of innovation competences

For CIEV international conference 2021, Portugal

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Geography of Finland

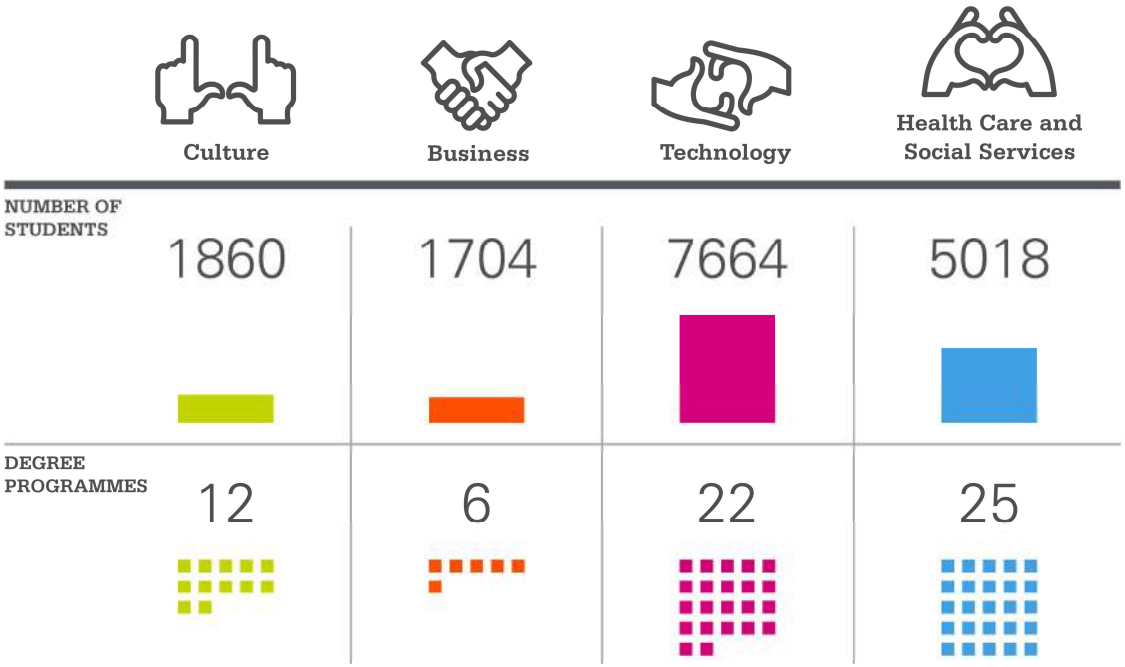
- There are four main areas in Finland
- Helsinki Region
- Costal
- Lakeland
- Lapland

Metropolia University of Applied Sciences, Finland

18.2.2021

Metropolia UAS is Finland's largest UAS that educates in the fields of culture, business, health care and social services and technology, with over 16,500 students and 63 degree programs

16 500 DEGREE STUDENTS



In addition

- 400 different continuing studies, 5500 participants
- 3345 Open UAS students
- 930 staff members

2019 figures

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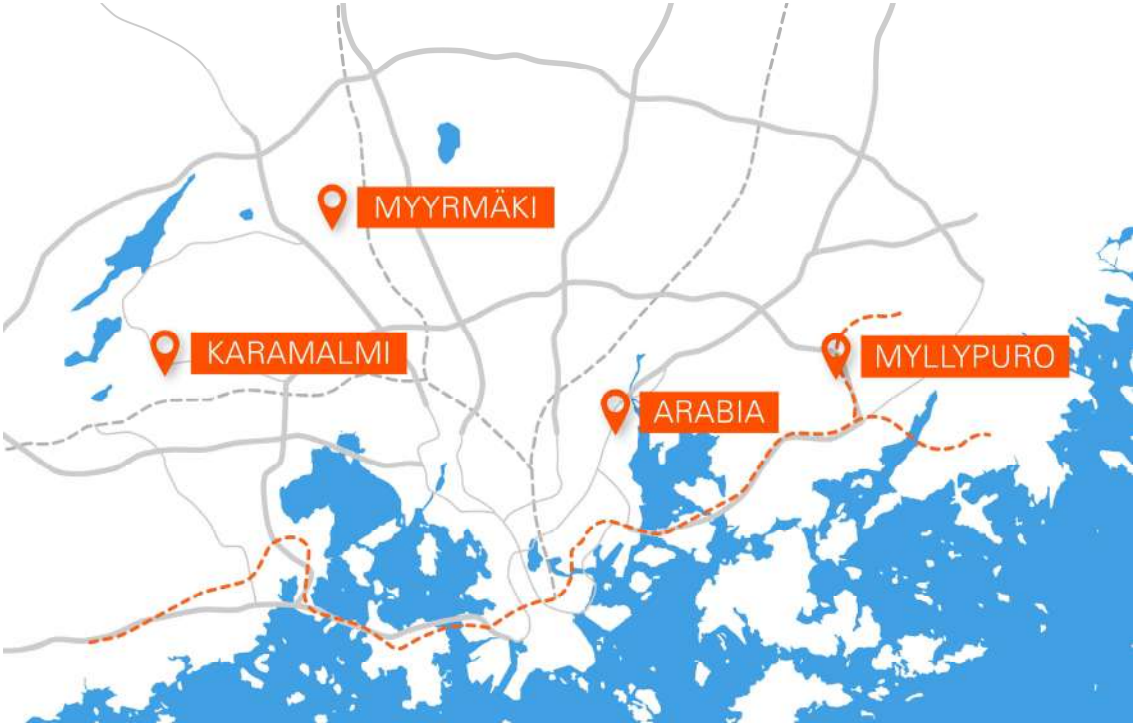
ONE METROPOLIA – FOUR CAMPUSES

Arabia Campus
- Culture

Karamalmi Campus
- Technology / ICT

Myllypuro Campus
- Technology / Construction
- Health Care and Social Services

Myyrmäki Campus
- Business
- Technology



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Metropolia’s new Myllypuro campus

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Quality of Life: the potential of innovation competences

- Background
- MINNO®Innovation project
- Researching the effects of MINNO®
- Conclusions

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Background

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Innovation and Europe

- Innovation – an increasing role in the European economy
- Innovations are needed, among other things, to
  - Create better jobs
  - Build a greener society
  - Improve the quality of life

https://www.europarl.europa.eu/factsheets/en/sheet/67/innovation-policy

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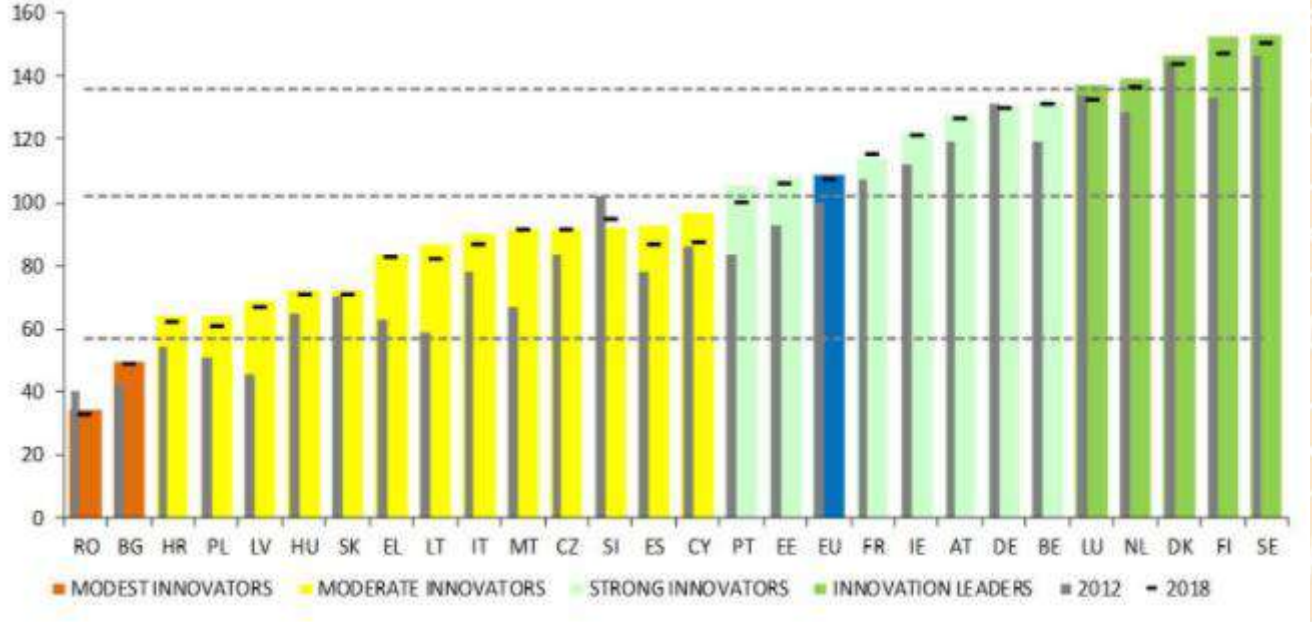
Innovation performance in the EU, 2020

- EU's innovation performance continues to increase at a steady pace: 8,9 % since 2012



https://ec.europa.eu/growth/industry/policy/innovation/scoreboards_en

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The research, development and innovation (RDI) infrastructure in Finland

- 13 universities
- 22 universities of applied sciences
- 12 public research institutes (solution-oriented research for societal decision making and business sector)
- 5 university hospitals
- Numerous other public or private research institutes or research units of organizations

2/3 of Finnish RD takes place in companies; companies are also involved with significant amount of innovations

https://www.research.fi/en/

METROPOLIA'S INNOVATIVE SOLUTIONS FOR THE FUTURE – TOGETHER

Phenomenon-based innovation hubs

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COLLABORATION PLATFORMS ENABLE OPERATION AS AN ECOSYSTEM

https://www.metropolia.fi/en/rdi/innovation-hubs/customer-oriented-wellbeing-and-health-services

1. HyMy Village offers wellbeing and health services as well as research and product development.

3. Helsinki XR Center operates at the center of research, startup and business cooperation in the XR field.

2. Urban Farm Lab is an energy, water and space efficient urban farming space.

4. Metropolia Workshop is a flexible project space for product development in automotive and transportation technology.

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5. Proof Health provides companies, research institutes and public sector organizations with a modern environment, flexible processes and extensive expertise in preclinical testing, piloting, validation and verification

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MINNO®Innovation project

Photographs: courtesy of Hannele Hokkanen and Laura-Maija Hero, senior lecturers / MINNO® projects

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MINNO®Innovation project

- MINNO® Innovation project means a collaborative team project that solves authentic problems by innovating a novel, practical and concrete solution.
- Every undergraduate takes part in a 10 ECTS innovation project, distributed across 7-14 weeks
- One project consists of 270 hours of development work and learning per student, normally 4–7 students/team from different fields of study
- The challenges arise from labour market needs and surrounding society
- Students, lecturers and tutors from various fields of study cooperate with organisations to create new solutions; teachers act as coaches
- The outcome will not be determined in advance: new solutions will be found during the process for the benefit of businesses and customers

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Project course contents

- The concept of innovation, development work management and building a development team.
- Collaborative project and innovation work and assessment:
  - brainstorming
  - future-oriented concepting and planning
  - customer and user understanding
  - contracts and copyrights
  - communicating, publishing
  - Productisation
  - marketing and implementation planning.
- Multidisciplinary teamwork, stakeholder activities and networking.
- Innovation development tools and methods.

MINNO® Innovation projects – building the future today

100 innovation projects completed each year

https://www.metropolia.fi/en/rdi/innovation-projects

MINNO® pedagogy

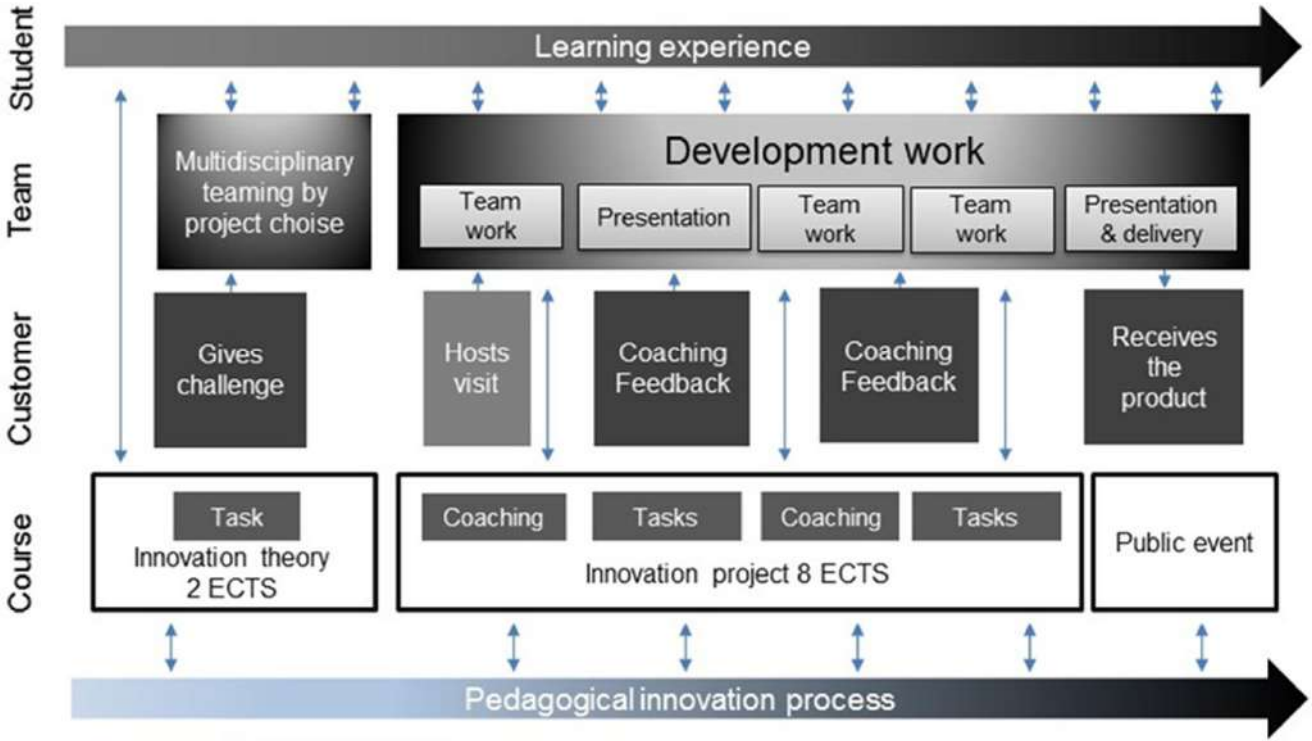
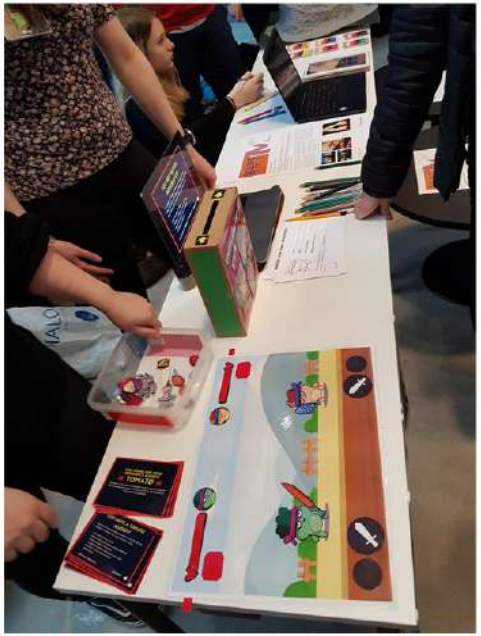


Figure 1. Multidisciplinary innovation pedagogy example (Hero & Lindfors, 2019)



E.g. Concept pitching (in the 3rd week)

Tools (theory) every Mon

Coaching by companies and teachers every Thu

MinnoFest – A big fair with stands and presentations, deliver whole package

Examples of MINNO projects in the healthcare sector

- **How to help children to experience a more enjoyable hospital visit with new technology?**
  Physiotherapy Microsoft Xbox Kinect game for the New Children's hospital.
- **How to make the elderly and children to meet?**
  A functional outdoor area as a meeting place for different generations. In cooperation with the City of Helsinki's Kustaankartano centre for the elderly.
- **How to improve the hospital environment?**
  New interior design of cancer clinic entrance hall.
- **How to go about drug education in a new way?**
  Computer games that educate people about substance abuse, for example Addiction Islands. In cooperation with the Finnish Association for Substance Abuse Prevention.
- **A guide dog's rewarding device for persons with disabilities.**
- **Ambulance simulator** for a safe way to learn how to provide emergency care. Automation Engineering, Mechanical Engineering and Emergency Care students created an ambulance simulator for emergency care teaching purposes.
- **A mobile phone alert for blood donors** informing them of the next opportunity to donate blood. Ordered by the Blood Service of the Finnish Red Cross.

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MobiDent –Mobile Application for Elderly Home Care in the Context of Oral Healt

MINNO | INNOVATION PROJECT!

TAPSU - Help Chart for Daily Oral Care

Taulukkoapuri päivittäiseen suunhoitoon

WHY?

To promote oral health of the elderly

To empower nurses to provide best possible care

- ✓ Visual
- ✓ Practical
- ✓ Easy to clean and disinfect
- ✓ Reusable
- ✓ Individualized
- ✓ Simple and quick to use

WHERE?

Co-operation with Munkkiniemen Palvelutalo

HOW?

By creating an instructional tool to guide nurses on a daily basis

metropolia.fi/en

Autumn 2018 TAPSU team:
Anita Badham, Ronja Halme, Helmi Harju, Eveline Penttilä, Rashmi Pyakurel, Maya Tai, Aino Vesterinen, Anni Vuorivirta, Hung Wang

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How to utilize the sences in elderly care where many people have memory dissordes?

Movable Multisensoral trolley

- -music
- -voices from the nature
- -scents from the nature
- -materials from the nature

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From Age man suit towards virtual reality: Virtua experience of Alzheimer or Cataract

A multidisciplinary team of a first year ICT student, 2 cultural managers, one social services students and one health student developed a working prototype of a Finnish sauna and wood chopping VR game in a 7 week MINNO. They were challenged by Helsinki XR center: “How could we engage our foreign visitors?”

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Researching the effects of MINNO®Innovation projects

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MINNO®Innovation project – the core research team

Dr Laura-Maija Hero, project leader, researcher

Dr Kaija Matinheikki-Kokko, researcher

Dr Marianne Pitkäjärvi, researcher

Currently: 4 students from Master’s programmes (4 x Master’s Thesis)

Contact: laura-maija.hero@metropolia.fi

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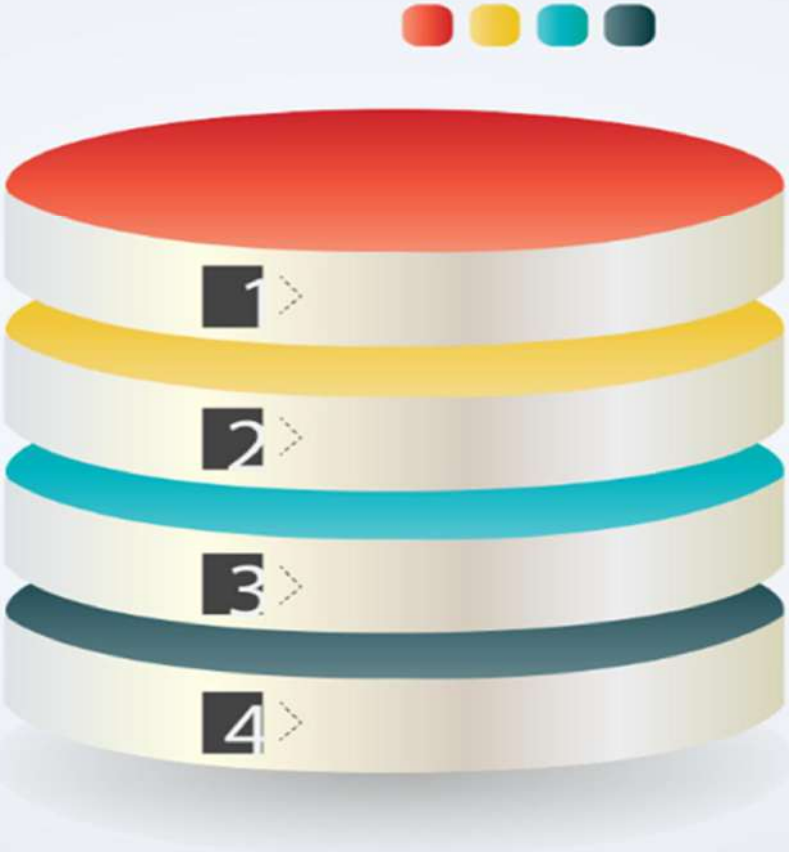
How do we study MINNO?

Simultaneous research and development activities at Metropolia UAS



Student innovation competence – development of the IIC scale, pilot study

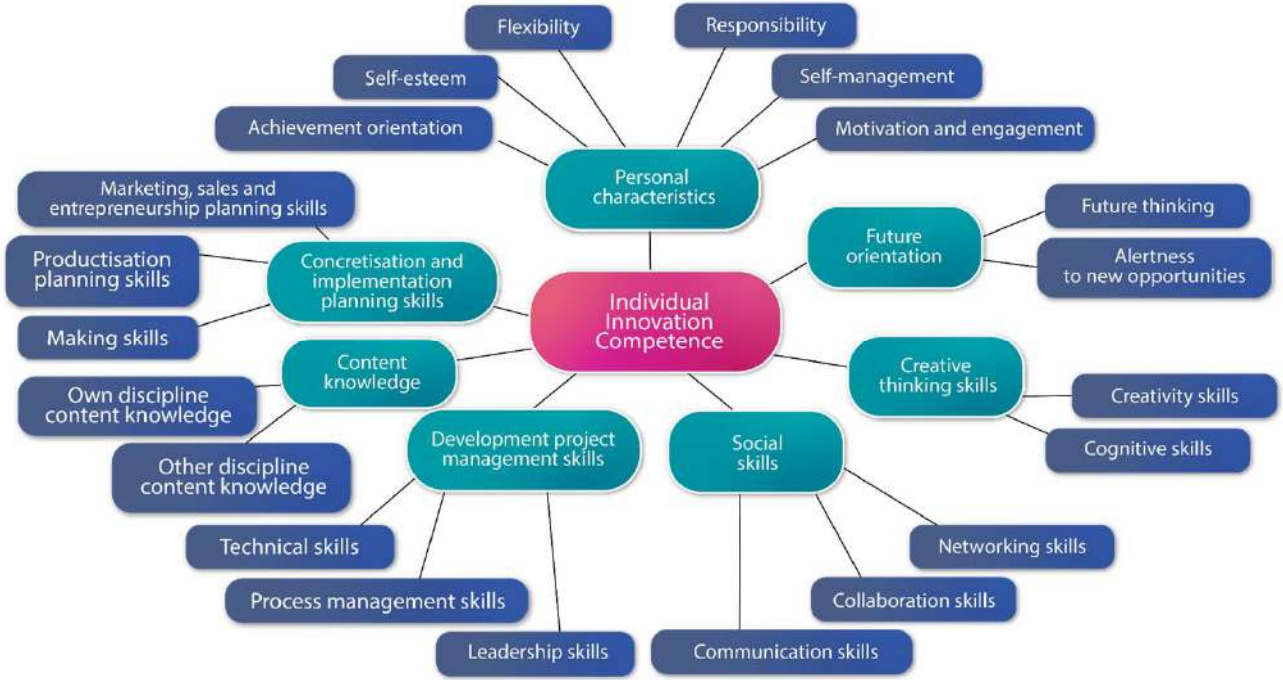
Multidisciplinary team learning and the innovativeness of outcomes

Effects in orgnizations, companies, area, society

The development of pedagogy and methods. (Developing assessment tools, dissemination and teacher training)

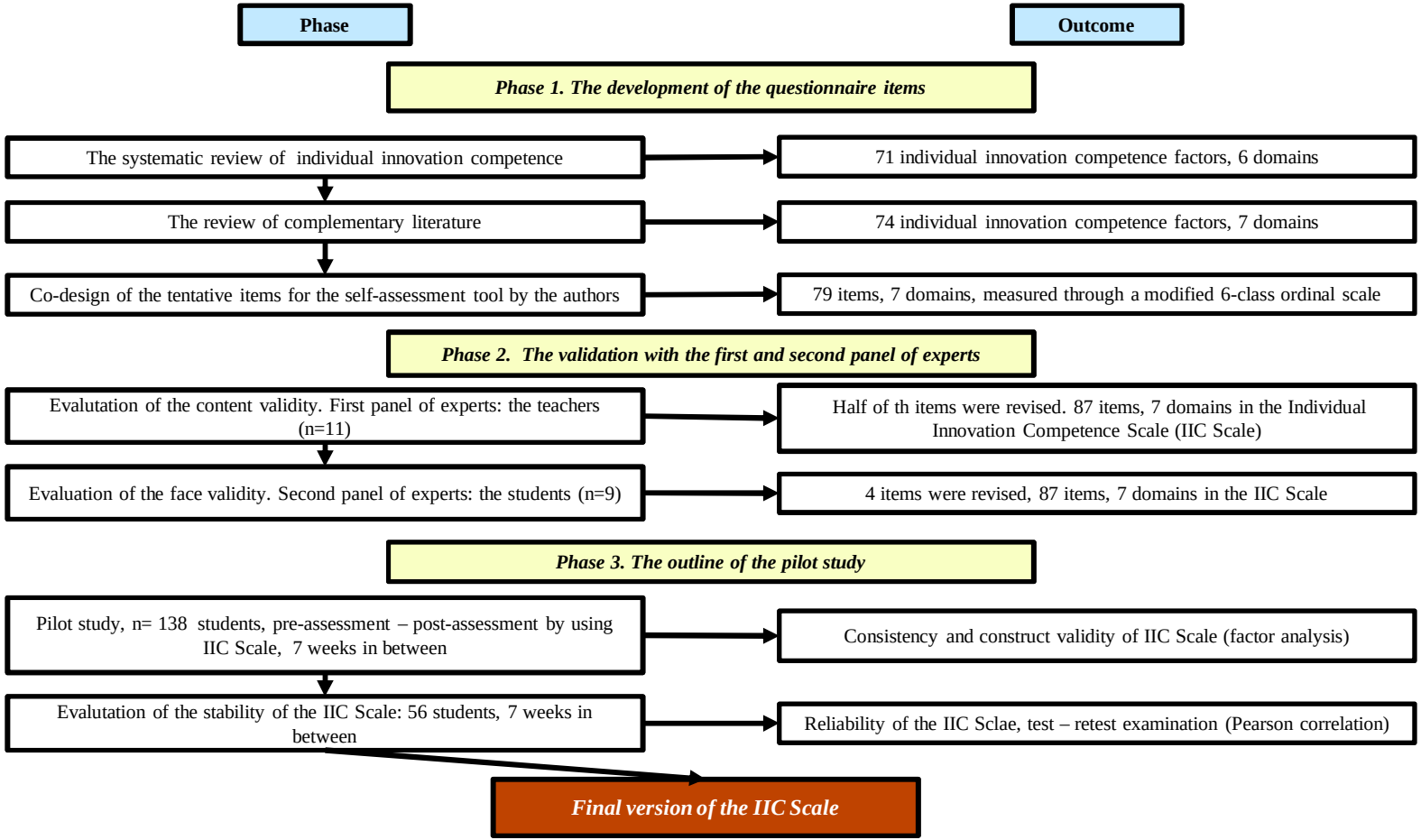
IIC based on a systematic review and complementary studies

http://www.urn.fi/URN:ISBN:978-952-328-222-3



Individual innovation competence, IIC scale (based on Hero, 2017; Hero et al., 2017/ SR; Hero & Lindfors, 2019).

Figure: development of the IIC scale



The sample for the **pilot study, Jan-May 2020**

- After removing a duplicate, 138 questionnaires were entered for the analysis of the data collected before the Minno project
- Of these, 56 were entered the also for the analysis of the data collected before AND after the Minno project

- Data collection continues!

Independend and dependend variables

- Independend
  - Age
  - Gender
  - Degree programme
  - Year of study

- Re-coding
  - Age: dichotomous
  - Year of study: dichotomous
  - Degree programme, 18 DPs into 6, according to the field of study

- Dependend
- 87 items into seven sum variables, representing the domains (literature based)
  - SUM personal characteristics SUM future orientation
  - SUM creative thinking skills
  - SUM social skills
  - SUM project management skills
  - SUM content knowledge
  - SUM implementation and concretization planning skills

IIC scale, exploration of the internal consistency and construct validity, Chronbach alphas by domain (n=138)

Table 1. Reliability analysis of the domains in the IIC scale (n=138)

Domain	Mean	Variance	Number of items	Chronbach's alpha
Personal characteristics	3.84	60.36	17	0.895
Future orientation	3.72	33.73	10	0.884
Creative thinking skills	3.70	59.13	13	0.885
Social skills	3.69	83.37	14	0.879
Project managements skills	3.40	204.29	21	0.873
Content knowledge	3.34	2.93	2	0.900
Concretization and implementation planning skills	2.59	104.23	10	0.910

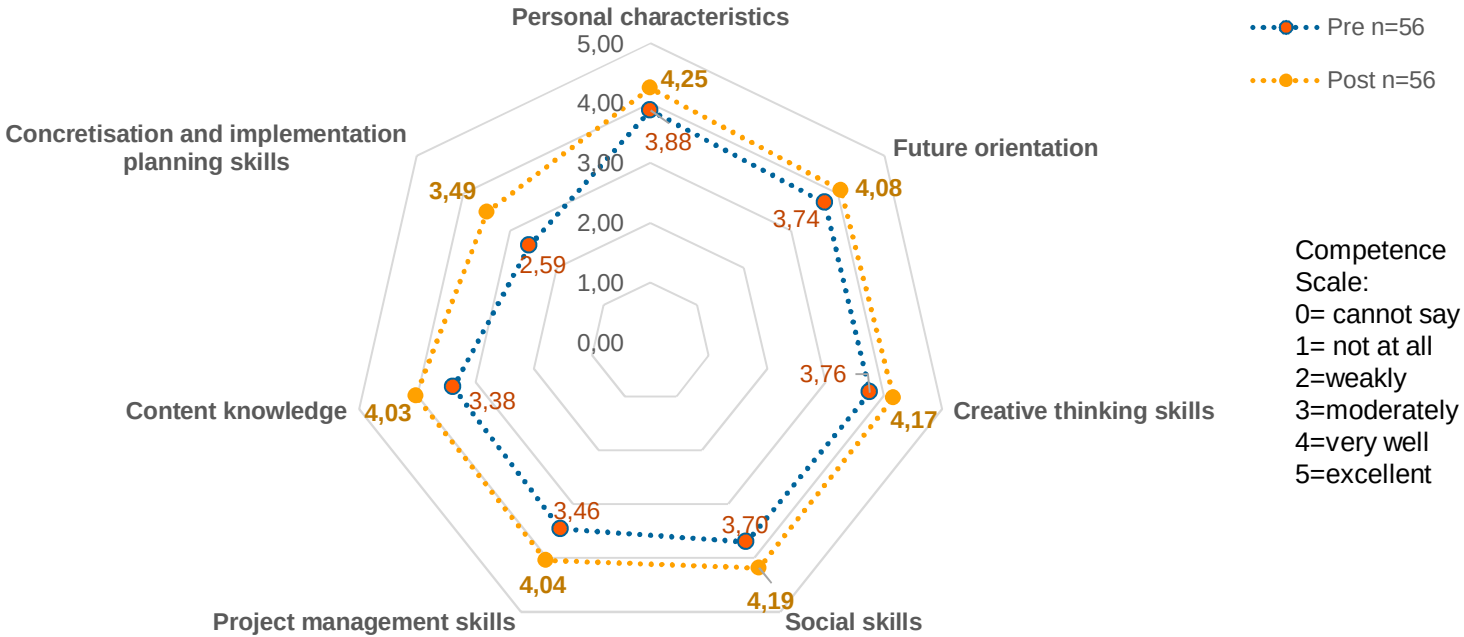


Figure. Pre- and Post-innovation competences according to the mean scores in each competence domain. The differences between students' self-assessments (n=56) were statistically significant (< 0,001, paired t-test) in each competence area.

Do you have an innovation project? Let's RDI together!

Student innovation competence *(Individual innovation competence scale)*

- Pre-post survey
- Post-pre survey
- Diary study
- Team learning activity and mediating artefacts

Student outcomes assessment *(Innovation assessment scale)*

- Document analysis

Firm, area, society effects *(Higher education innovation effects scale)*

- Value for the customer organization
- Value for the end-user and the society
- Trajectory of the product after Minno by interviewing and network analysis

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