Innopeda® introduction

Liisa Kairisto-Mertanen
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Outline of the presentation

- Background
- Innovation pedagogy
- Innovation competencies
- Cornerstones
- The process of implementation
- Discussion
Suomi on maailman vakain valtio. The Fund for Peace, *Fragile States Index 2016*
Suomi on maailman turvallisin maa. *World Economic Forum, Travel and Tourism Competitiveness Report 2015: Finland*
Suomessa on maailman paras hallinto. *Legatum Institute, The Legatum Prosperity Index 2016: Finland*
Suomessa on maailman paras lehdistönvapaus. *Reporters Without Borders, 2016 World Press Freedom Index*

- Suomessa on eniten maailmassa
- Suomi on OECD-maiden kärkimaa koulutuksessa. *OECD, Better Life Index: Education*
- Suomi on maailman lukutaitoisin maa. *J. W. Miller ja M. C. McKenna, World Literacy: How Countries Rank and Why It Matters* (Routledge 2016)
- Suomessa on maailman toiseksi parhainta
  - korkeakouluiltaa valmistuneiden luku- ja kirjoitustaito. *Education at a Glance 2016*
- Suomessa juodaan eniten kahvia, *International Coffee Organization, Coffee Trade Statistics*
Finland is number 1

The best country for mothers
*Save the Children*

The world’s strongest state
*Fund for Peace*

The country with most rally championships
*World Rally Championship*

Helsinki –
The most honest city in the world
*Reader’s Digest*

The world’s best junior ice hockey team 2014
*International ice hockey federation*

Europe’s most forested country – about 70% of Finland is covered with trees
*Food and Agriculture Organization*

World’s least failed state 2013
*The Fund for Peace*
There are going to be big changes in the way we work. Are the universities prepared?
Is higher education producing Competences that really matter?
Future work skills 2020

By Institute for the Future for the University of Phoenix Research Institute

The report presents:
• 6 drivers of change, disruptive forces that change how work is done in the future
• Based on there 10 skills which are believed to be critical for success in workplace
10 skills critical for success in the workforce by year 2020

1. Sense-Making
   **Definition:** Ability to determine the deeper meaning or significance of what is being expressed.

2. Social Intelligence
   **Definition:** Ability to connect to others in a deep and direct way, to sense and stimulate reactions and desired interactions.

3. Novel & Adaptive Thinking
   **Definition:** Proficiency at thinking and coming up with solutions and responses beyond that which is routine or rule-based.

4. Cross-Cultural Competency
   **Definition:** Ability to operate in different cultural settings.

5. Computational Thinking
   **Definition:** Ability to translate vast amounts of data into abstract concepts and to understand data-based reasoning.

6. New-Media Literacy
   **Definition:** Ability to critically assess and develop content that uses new media forms, and to leverage these media for persuasive communication.

7. Transdisciplinarity
   **Definition:** Literacy in and ability to understand concepts across multiple disciplines.

8. Design Mindset
   **Definition:** Ability to represent and develop tasks and work processes for desired outcomes.

9. Cognitive Load Management

10. Virtual Collaboration

Source: http://www.iftf.org/futureworkskills/

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Complex Problem Solving
Critical Thinking
Creativity
People Management
Coordinating with Others
Emotional Intelligence
Judgment and Decision Making
Service Orientation
Negotiation
Cognitive Flexibility

Future of jobs
Top 10 skills at 2020

Innovations wanted!

For national success
To save the planet
Mission all around the world
Central element in policy agendas
Earnings logic in companies is based on innovations
Change in education is a must

Traditional university pedagogy

- Focus on education
- Learning about the content
- Explicit knowledge
- Failure or success is clear
- Problems that can be easily solved

Stable world

Innovation pedagogy

- Doing, watching, interacting, experimenting, connecting
- Tacit knowledge
- Wicked problems
- Includes also unofficial situations
- Make connections with already familiar
- Experiences are gained regardless of success or failure

Constantly changing world

www.turkuamk.fi
Innovation?

Utilized Competence-based Competitive Advantage
(Finnish Innovation Strategy 2008)
Utilized competence based competitive advantage
(Fi Innovation strategy 2008)

The process of constantly improving knowledge, which leads to new sustainable, ideas, products, further knowledge or other practices applicable in working life

Radical innovations create major disruptive changes whereas incremental innovation continuously advance the process of change
(Schumpeter 1942)
At Turku University of Applied Sciences, we...

- **Aim at educating innovative graduates**
- **Emphasize innovation**
- **Try to understand what it requires to achieve our aim**
- **Apply innovation pedagogy**
The innovation process

What are the **antecedents** of innovations: the **innovation competencies**?

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on a renewed EU agenda for higher education

{SWD(2017) 164 final}
PRIORITIES FOR ACTION

1. Tackling future skills mismatches and promoting excellence in skills development
2. Building inclusive and connected higher education systems
3. Ensuring higher education institutions contribute to innovation
4. Supporting effective and efficient higher education systems

Source: COM(2017) 247 final
PRIORITIES FOR ACTION

1. Tackling future skills mismatches and promoting excellence in skills development

2. Building inclusive and connected higher education systems

3. Ensuring higher education institutions contribute to innovation

4. Supporting effective and efficient higher education systems

Source: COM(2017) 247 final
5.2 Promising approaches

5.2.1 Promoting entrepreneurship, creativity and innovation skills

76. Higher education institutions increasingly recognise that they must afford young minds the opportunity to develop skills that inspire, encourage and enable innovation. Although it is difficult to make explicit links between specific skills and innovation, there is a move towards rethinking education and training programmes to promote the combined skills of creative and critical thinking, entrepreneurship, problem-solving, risk-taking and resilience, management, communication, exploiting the results of research and independent analysis. Promoting, assessing and rewarding these skills sets in higher education, alongside acquisition of detailed subject knowledge, is one of the challenges faced by teaching staff across Europe.

77. A step in this direction is the FINCODA project\textsuperscript{77} led by Turku University of Applied Sciences that aims to develop a tool to assess students' 'innovation competences' during their studies and comprises a plan for training teachers to use the criteria. A further extension of FINCODA thinking is an initiative by the European Institute of Innovation and Technology's (EIT) Climate-KIC to develop a framework that defines essential innovation competencies and describes quality standards to develop and measure them respectively. This aims to create a pan-European standard for assessing innovation and entrepreneurship skills, with a focus on the climate change field\textsuperscript{78}.

**FINCODA**

At the core of this project is the development of the FINCODA Innovation Barometer Assessment Tool. This is a psychometric tool that measures individuals' capacity for innovation. It breaks innovation into five core areas and assesses the individual's capacity in each of these areas separately. The research underpinning this tool has been conducted by the FINCODA partners who as a whole bring together both the academic and industry innovation expertise from across Europe. The project will develop an online toolkit for behavioural assessment relating to innovation and a massive open online course (MOOC) related to behaviour assessment to disseminate the methods.

Source: FINCODA
Innovation pedagogy in a nutshell

Cornerstones needed

Innovation competency

Future substance based competency

Success
Better life

Turku AMK
Turku University of Applied Sciences
Hierarchy of pedagogical choices

- **Learning tools**: simulation, reading circle, hatchery methods, interactive lecture...
- **Learning methods**: e.g. fysical facilities, learning diary, SmartBoard, labs, blogs, ...
- **Pedagogical models**: PBL, CDIO, project learning....
- **Innovation pedagogy**: Constructivist, socio-constructivist, sociocultural...
- **Approaches to learning**: widened knowledge concept, humanism...
- **Definitions of knowledge, definitions of man**
Innovation Pedagogy
Cornerstones

- Working life orientation
- Multidisciplinarity
  - Educational research, development, and innovation methods (ERDIM)
    - Assessment
    - RDI embedded in learning
    - Global perspective
- Flexible curricula
- Renewing teacher roles
- Systems thinking (incl. entrepreneurship)
- Renewing ability to study
Cornerstones used at TUAS
Implementing necessary requirements

The whole education must be planned so that both innovation competencies and subject based competencies are reached.
Cornerstones at strategy level

1. Working life orientation

2. Systems thinking (incl. entrepreneurship)
1. Working life orientation

The privilege to work is a gift, the power to work is a blessing, the love of work is success!
2. Systems thinking
- positioning oneself
- global perspective
- entrepreneurship
- understanding the customer
Group task, making the change 1

Working life orientation and systems thinking:
   Current situation in your university? Is there a need for a change?
   How would you like to see the future?
   What kind of changes are needed?
   List first steps to take in your university?

Present situation at your university
  step 1  step 2  step 3  step 4  Future situation at your university

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Cornerstones at department level

1. Working life orientation
2. Systems thinking (incl. entrepreneurship)
3. Multidisciplinarity
4. Flexible curricula
5. Renewing teacher roles
6. Renewing ability to study
3. Multidisciplinarity

“We are not students of some subject matter but students of problems. And problems may cut right across the borders of any subject matter or discipline ” Karl Popper
Multidisciplinarity is about boundary crossing

- Boundary crossing theory focusses on the possibilities for making connections between different practices of which the boundaries are perceived as problematic (Engeström, 2014; Engeström et al., 1995).
- Boundaries are perceived to be socio-cultural differences leading to discontinuity in action or interaction (Akkerman & Bakker, 2011).
- Boundary crossing refers to a person’s transitions and interactions across different positions and to efforts to accomplish or restore continuity in action or interaction between practices (Akkerman & Bakker, 2011; Suchman, 1993).
**Experiencing multidisciplinarity**

Stapley, Lionel (2005) Individuals, Groups, and Organizations Beneath the Surface: An Introduction

- We shape our world constantly to make it understandable and comprehensive
- It is done by categorizing
- We define ourselves by drawing boundaries
- Everything we understand as describing ourselves stays inside the boundaries

In our case we aimed to place our multidisciplinarity inside ME
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4. Flexible curricula

Degree 210 cr r 240 cr

- Basic studies
- Professional studies
- Project studies

Personal study plan
“I am not a teacher, but an awakener”

Robert Frost
6. Renewing ability to study
Group questions

How do you support the student’s renewing ability to study?

What obstacles do you see in your country?

How could these obstacles be overcome, give practical examples.
Flexible curricula, multidisciplinarity, renewing teacher and student roles:

Current situation in your university? Is there a need for a change?
How would you like to see the future?
What kind of changes are needed?
List first steps to take in your university?
Cornerstones at faculty level

7. Educational research, development and innovation methods (ERDIM)
8. Assessment
9. RDI embedded in learning
10. Global perspective
Traditional university pedagogy

Innovation pedagogy

Stable world

Constantly changing world

Learning about the content

Focus on education

Failure or success is clear

Problems that can be easily solved

explicit knowledge

Experiences are gained

regardless of success or failure

Wicked problems

Includes also unofficial situations

Making connections with already familiar

Doing, watching, interacting, experimenting

tacit knowledge

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Group questions

How do you support the renewing teacher roles?

What obstacles do you see in your country?

How could these obstacles be overcome, give practical examples.
Exercise
Six thinking hats

Every hat denotes a different way of thinking

Participants adopt the role and thinking process relating to the hat they have been assigned

Expressing a variety of opinions and ideas is usually easier though a character
<table>
<thead>
<tr>
<th>Color</th>
<th>Description</th>
<th>Questions</th>
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<tbody>
<tr>
<td>White</td>
<td>Neutral</td>
<td>What information is available? What information is needed?</td>
</tr>
<tr>
<td>Red</td>
<td>Emotion, intuition, hunches</td>
<td>How do I feel about this?</td>
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<tr>
<td></td>
<td>Can express opinions without factual basis</td>
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</tr>
<tr>
<td>Black</td>
<td>Critically-minded and cautious</td>
<td>What are benefits and drawbacks of this proposal?</td>
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<tr>
<td></td>
<td>Attempts to identify risks and problems</td>
<td>What do I need to take into consideration?</td>
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<td></td>
<td>No emotional arguments</td>
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<tr>
<td>Yellow</td>
<td>Positive and constructive attitude</td>
<td>What are the benefits?</td>
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<tr>
<td></td>
<td>Considers the benefits to each solution</td>
<td>How can we achieve our goals?</td>
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<tr>
<td></td>
<td>No emotional arguments</td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td>Brainstorming hat</td>
<td>What other options and ideas are there?</td>
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<tr>
<td></td>
<td>Creative and innovative</td>
<td>Could we do this differently?</td>
</tr>
<tr>
<td></td>
<td>Puts forward new ideas and possibilities</td>
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<tr>
<td>Blue</td>
<td>Usually a leader</td>
<td>How do we approach this?</td>
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<td></td>
<td>Observes and forward plans the group’s activities</td>
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<td></td>
<td>Provides summaries and conclusions</td>
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EXAMPLE SCENARIO 1

Brainstorming ideas for an event, possibly with a recycling theme: The aim is to generate ideas for campaigns, performances and other activities. Even the most off-the-wall ideas are welcome.

1. The instructor introduces the topic and the objectives. The instructor then provides the instructions and introduces the hats.

2. The group choose a secretary who will make a note of all ideas and comments.

3. The participants form a circle to ensure that everyone can see and hear each other.

4. The hats are passed around the group one colour at a time to ensure that everyone has time to contribute.
   - The white hat begins: What are the practicalities? *When, where, etc?*
   - The red hat: What kinds of responses or expectations does this event evoke? *Bashy weirdies, chilled out day...*
   - The green hat: brainstorming – the wilder the better. What could the event look like? *Concerts, arts workshops...* It is a good idea to dedicate more time to the green hat round than the others.
   - The black hat: critical evaluation of the ideas put forward and the event as a whole. *Not everyone enjoys loud background music, what if it rains?*
   - The yellow hat: a positive approach to all the ideas put forward and the event as a whole. What are the benefits of this? *You inspire people, the arts workshops are a great way to...*

5. Now, all the ideas are done through and observations written down by the secretary. People responsible for organising the event analyse the results and use them to guide the event planning process.
Group work: Implementing ERDIM at your university

Make six groups
Every group gets one hat
Work accordingly to the idea of the hat you represent
Write down the most important and interesting results of your group
Choose one person to present the results of the work in the group to the whole audience
We remember 90% of what we SAY and DO e.g. Doing a dramatic presentation, making a video, creating an animation, building a robot. We remember 70% of what we SAY.

We remember 50% of what we HEAR and SEE. e.g. Watching a video, a presentation, a demonstration.

We remember 30% of what we SEE. e.g. Looking at images in a book, a magazine, a website.

We remember 20% of what we HEAR. e.g. Listening to a lecture, a podcast, a radio interview.

We remember 10% of what we READ. e.g. Reading a book, an article, a blogpost.

Based on the work of Edgar Dale

@syriaduckworth
Study units: project hatchery and leading a team

**ERDIM methods**
(educational research, development and innovation methods)

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Flipped classroom

https://www.youtube.com/watch?v=oXPHN9gkWBk
8. Assessment

The Purpose of...

assessment is to INCREASE quality.

evaluation is to JUDGE quality.

Too short and not enough leaves. C-
FOR A FAIR SELECTION EVERYBODY HAS TO TAKE THE SAME EXAM: PLEASE CLIMB THAT TREE.

on a renewed EU agenda for higher education

{SWD(2017) 164 final}
PRIORITY FOR ACTION

1. Tackling future skills mismatches and promoting excellence in skills development

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Source: COM(2017) 247 final
FINCODA
Framework for Innovation Competencies Development and Assessment
Erasmus+ Knowledge Alliances project 1.1.2015-31.12.2017

FINCODA CONSORTIUM

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<td>Carter &amp; Corson Partnership Ltd., UK</td>
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<td>Celestica Valenciana S.A, ES</td>
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<td>Schneider Electric España SA, ES</td>
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Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions

A renewed EU agenda for higher education
5.2 Promising approaches

5.2.1 Promoting entrepreneurship, creativity and innovation skills

Higher education institutions increasingly recognise that they must afford young minds the opportunity to develop skills that inspire, encourage and enable innovation. Although it is difficult to make explicit links between specific skills and innovation, there is a move towards rethinking education and training programmes to promote the combined skills of creative and critical thinking, entrepreneurship, problem-solving, risk-taking and resilience, management, communication, exploiting the results of research and independent analysis. Promoting, assessing and rewarding these skills sets in higher education, alongside acquisition of detailed subject knowledge, is one of the challenges faced by teaching staff across Europe.

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Research on innovation competences

- **INCODE**
  - Co-funded by LLP
  - How to measure innovation competencies
  - Theoretical background building INCODE barometer
  - 2011-2013

- **INNOKOMPPI**
  - Co-funded by ERF
  - Validating the tool
  - INNOKOMPPI barometer
  - 2012-2014

- **FINCODA**
  - Co-funded by Erasmus KA
  - From higher education to the enterprises
  - FINCODA barometer to be used also in enterprises
  - Software application tool
  - 2014-2017
Innovation competencies: INCODE project

**Individual**
- An innovative individual forms the base
  - Goal orientation
  - Creative problem solving
  - Systems thinking

**Interpersonal**
- Ability to connect through interaction in the network of competencies
  - Teamworking

**Networking**
- Ability to build networks and operate using them
  - Networking
Innovation

- Initiative
- Creativity
- Critical Thinking
- Team Work
- Networking

Competence

© FINCODA UPV-SEE-CSP team (2017). Innovation Competence Model

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<th>FINCODA BAROMETER</th>
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<tr>
<td>1</td>
<td>Think differently and adopt different perspectives (green=CREATIVITY)</td>
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<tr>
<td>2</td>
<td>Be attentive when others are speaking, and respond effectively to others' comments during the conversation (yellow=TEAMWORK)</td>
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<td>3</td>
<td>Use intuition and own knowledge to start actions</td>
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<td>4</td>
<td>Invite feedback and comments</td>
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<tr>
<td>5</td>
<td>Foster improvements in work organization</td>
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<tr>
<td>6</td>
<td>Obtain constructive comments from colleagues (pink=INITIATIVE)</td>
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<tr>
<td>7</td>
<td>Find new ways to implement ideas</td>
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<td>8</td>
<td>Identify sources of conflict between oneself and others, or among other people, and to take steps to overcome disharmony</td>
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<td>9</td>
<td>Take an acceptable level of risk to support new ideas</td>
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<td>10</td>
<td>Go beyond expectations in the assignment, task, or job description without being asked</td>
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<td>11</td>
<td>Meet people with different kinds of ideas and perspectives to extend your own knowledge domains (blue=NETWORKING)</td>
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<tr>
<td>12</td>
<td>Convince people to support an innovative idea</td>
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<td>13</td>
<td>Systematically introduce new ideas into work practices</td>
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<td>14</td>
<td>Act quickly and energetically</td>
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<tr>
<td>15</td>
<td>Generate original solutions for problems or to opportunities</td>
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<tr>
<td>16</td>
<td>Use trial and error for problem solving (grey=CRITICAL THINKING)</td>
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<td>17</td>
<td>Develop and experiment with new ways of problem solving</td>
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<td>18</td>
<td>Acquire, assimilate, transform and exploit external knowledge to establish, manage and learn from informal organisational ties</td>
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<td>19</td>
<td>Challenge the status quo</td>
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<td>20</td>
<td>Face the task from different points of view</td>
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<tr>
<td>21</td>
<td>Make suggestions to improve current process products or services</td>
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<tr>
<td>22</td>
<td>Present novel ideas</td>
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<tr>
<td>23</td>
<td>Forecast impact on users</td>
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<tr>
<td>24</td>
<td>Show inventiveness in using resources</td>
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<tr>
<td>25</td>
<td>Search out new working methods, techniques or instruments</td>
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<tr>
<td>26</td>
<td>Provide constructive feedback, cooperation, coaching or help to team colleagues</td>
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<td>27</td>
<td>Work well with others, understanding their needs and being sympathetic with them</td>
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<td>28</td>
<td>Share timely information with the appropriate stakeholders</td>
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<td>29</td>
<td>Consult about essential changes</td>
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<tr>
<td>30</td>
<td>Build relationships outside the team/organization</td>
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<tr>
<td>31</td>
<td>Refine ideas into a useful form</td>
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<tr>
<td>32</td>
<td>Engage outsiders of the core work group from the beginning</td>
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<tr>
<td>33</td>
<td>Ask “Why?” and “Why not?” and “What if?” with a purpose</td>
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<tr>
<td>34</td>
<td>Work in multidisciplinary environments</td>
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9. RDI embedded in learning

University

Co-operation with working life?

Research

Guru

Firma

Tukialus

SEC

Enterprises

University of applied research

KTK

Co-operatives

Capstone

Project hatchery

Monkey

Bisnesacademy

RDI

Work placement

Individual knowledge

Networking knowledge

Interpersonal knowledge
Group discussion

If we want to change something, where do we start?
What are the first measures to be taken?
Implementing Innovation pedagogy in the faculty: methods of intervention

**Tutoring**
means providing expertise, experience, and encouragement and general assistance in problem solving when the person to be tutored finds answers by him/herself. (Chin, Rabow & Jeimee 2011.)

**Coaching**
is a training or development process via which an individual is supported while achieving a specific personal or professional competence result or goal. (Minor 2014.)

**Process consultation**
puts the emphasis on helping others to help themselves, not on solving their problems for them or giving them advice. (Beddoe 2010, Keskinen 2010)

**Mentoring**
A mentor can help to prioritize projects to be done and provide a set of “good practices” for how to approach a given problem. A mentor can also help to understand how change occurs, as well as how to plan for and implement change (Minor 2014)

**Supervision**
is an ongoing and regular process which aims at learning through interaction. Supervision provides the chance to stand apart from our work and to reflect on what we do, the context of what we do and the impact that this has on ourselves as professional people. (Schein 1987, Sandoval 2014)
The process

**Underlying assumptions and challenges in the process**

Questioning the way how people work
A change from a very independent profession to working in teams and networks
Changing the attitude towards leaning among students and faculty members
Mistakes were made: the "not invented here" phenomenon was met
The process

*Underlying assumptions and challenges in the process*

Questioning the way how people work
A change from a very independent profession to working in teams and networks
Changing the attitude towards leaning among students and faculty members
Mistakes were made: the "not invented here” phenomenon was met
The process of introducing change

**Working with the artifacts**
- Making innovation pedagogy visible
- Introducing cooperation between faculty members
- Activating students and giving them responsibility of their learning
- Building trust across boundaries

**Contributing to the expoused values in the faculty**
- Introducing forums to talk about the new way
  - Innostudio
  - Innoteam
- Development seminars for the whole faculty
- Involving also students in the discussion
- Common multidisciplinary study unit for the whole faculty: Project hatchery
Producing education is service business and cocreation of value
(Vargo & Lusch 2004)

- Producing services
- Results are achieved only if the students can be engaged
- It is about creating value
- Faculty members monitor the process and maximize its success
- Success calls for cooperation
- Connections outside of the university, cooperation with students and common sharing of knowledge among faculty members are essentially important

Innopeda® introduction – Liisa Kairisto-Mertanen - 2017
Excellence in action

- Good atmosphere in the faculty
- The common project hatchery is not questioned any more
- Faculty members work together across study programs
- Better practices are shared among faculty
- New ways of making learning more effective are found every year
- Research and development ideas are born
- Innostudio has become common practice
- Students have taken a more active role in the different development processes
Thank you!

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