

# Learning at the Interface of Higher Education and Work

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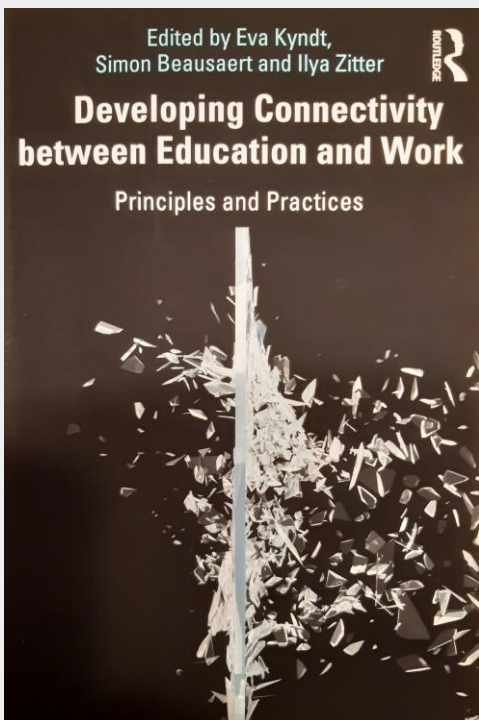
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Educational Research



<https://ktl.jyu.fi/en>



# Chapter 2.2

## LEARNING AT THE INTERFACE OF HIGHER EDUCATION AND WORK

Experiences of students, teachers and workplace partners

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### Introduction

In recent decades, interest in developing a pedagogic approach in higher education to meet the needs and expectations of the world of work has increased for several reasons. On the societal level, concerns about the professional relevance of higher education programmes have become persistent. The



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# Background: major global challenges



Innovations

**Artificial  
intelligence**

**COVID-19**

**Digitalization**

**Robotization**

Techonological development

Networking



<http://herbu1.files.wordpress.com/2009/06/future-thinking.jpg>

**Globalisation**

Immigration

**Sustainability  
Climate  
change**

Increasing amount  
of information

**Continuous change**

Complicated problems





# What kind of skills and qualities are needed ?

World Economy Forum (top key skills in 2025)	Barnett (2002): Living in supercomplex world requires	Maxwell ( ), Sternberg ( ), Kallio (xxxx); Heikkinen et al (xxxx); Tynjälä, Kallio & Heikkinen (2020)
Analytical thinking and innovation Active learning and learning strategies Complex problem solving Critical thinking and analysis Creativity, originality and initiative Leadership and social influence Technology use, monitoring and control Technology design and programming Resilience, stress tolerance and flexibility Reasoning, problem solving and ideation IN SUM: problem solving, self-management, working with people,	Human qualities such as: Carefulness Thoughtfulness Humility Criticality Receptiveness Resilience Courate Stillness	Wisdom



[http://www.ipc.dk/en/long\\_courses\\_themes.asp?theme=1&subject=12](http://www.ipc.dk/en/long_courses_themes.asp?theme=1&subject=12)

# How to develop generic skills, human qualities and wisdom?



→ By expanding and integrating contexts of learning



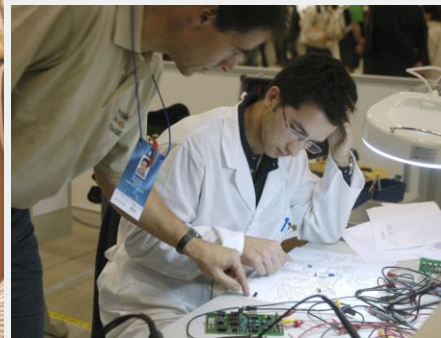
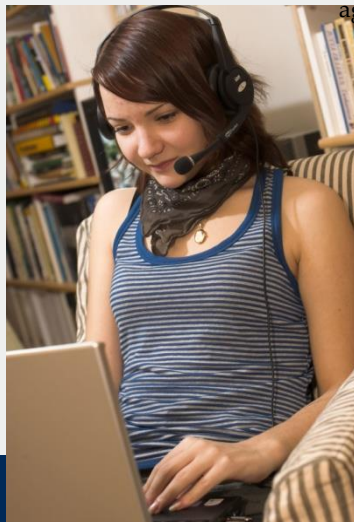
Photos: Martti Minkkinen



<http://knowledge.allianz.com/demography/population/?351/aging-societies-and-shrinking-workforce>



Martti Minkkinen



World Skills 2005  
Photos Martti Minkkinen



Karrasch et al. Lukion psykologia 4, p. 141



# Findings

based on the following studies:

Tynjälä et al., 2021

Virtanen & Tynjälä, 2021, 2019

Kallio 2020

Töytäri et al., 2019

Virtanen et al., 2014

Arpiainen et al, 2013

Virolainen et al., 20xx

Tynjälä et al., 2009

Helle et al., 2007

## Work-integrated learning

Work-based learning

Work-related learning

Working at the workplace

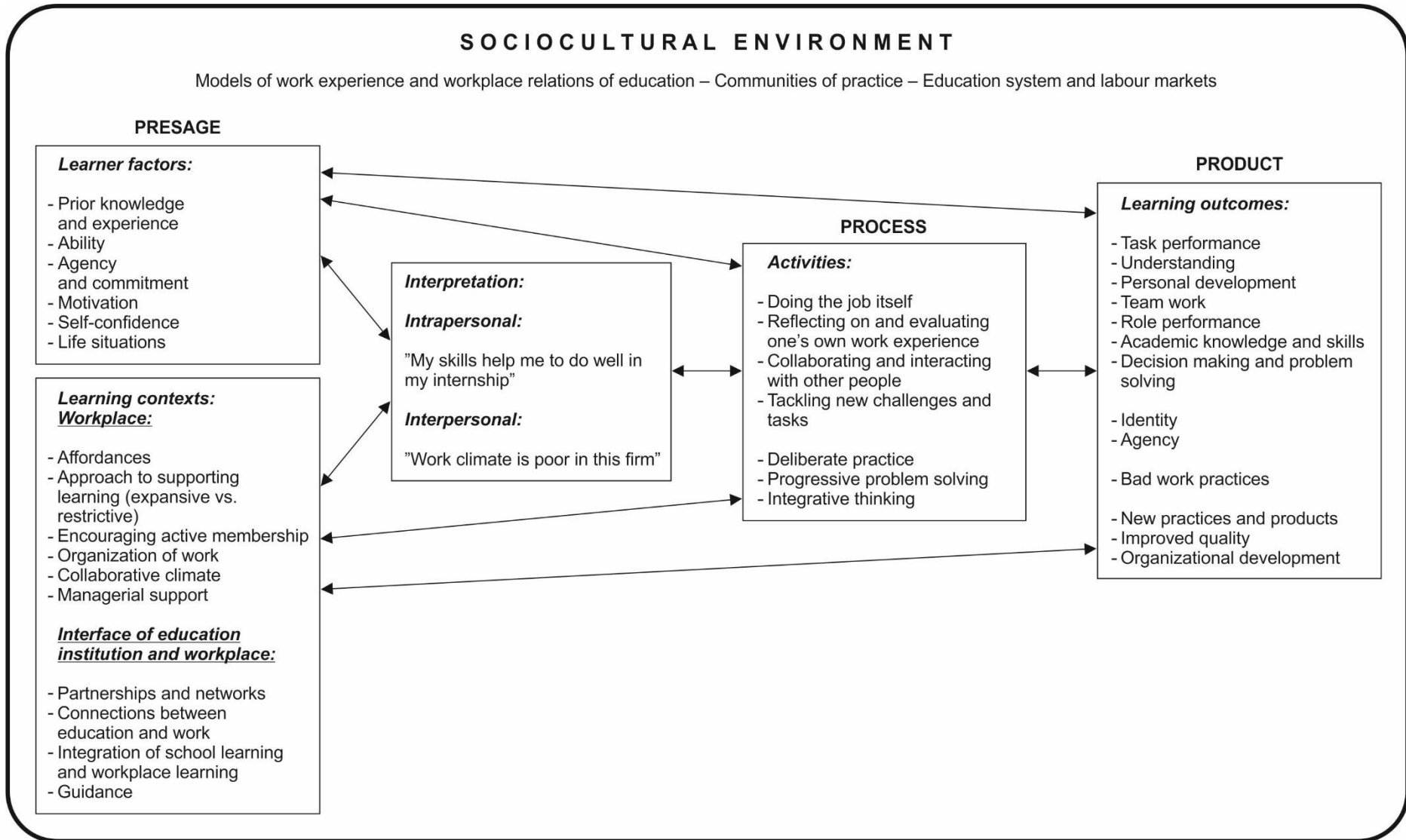
Project assignment from the workplace

Working mostly at university, occasionally at the workplace



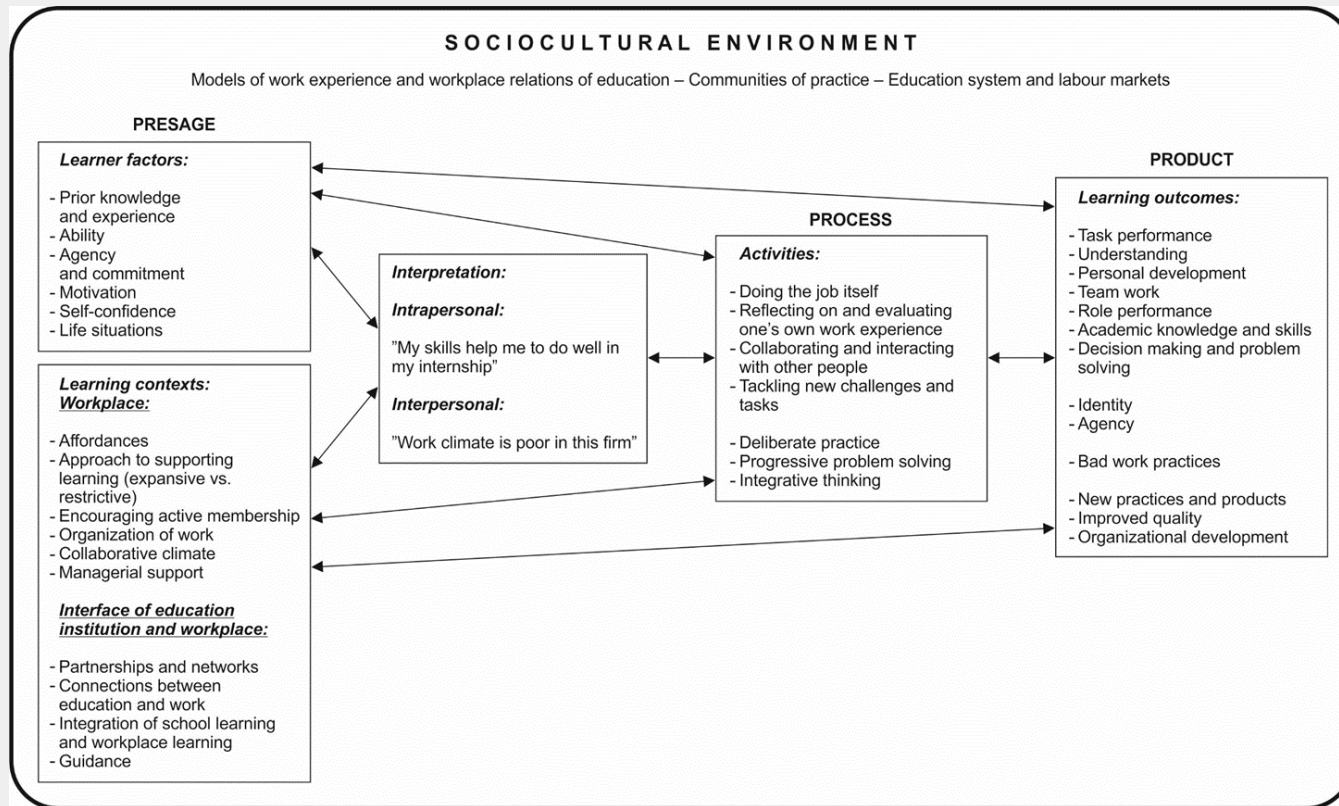
# 3-P Model of Student Learning at the Workplace

(Tynjälä et al., 2021; modified from Tynjälä 2013; Biggs 1999, 2001)





# How do students, teachers and workplace partners describe the Presage, Process and Product factors of student learning in work-integrated study modules and work-based learning?





# Presage factors (=background factors)

<b>Students</b>	<b>Teachers</b>	<b>Workplace partners</b>
<p><i>Factors related to students:</i></p> <ul style="list-style-type: none"> <li>• Age and class</li> <li>• Previous work experience and earlier studies</li> <li>• Motivation</li> </ul> <p><i>Factors related to the context:</i></p> <ul style="list-style-type: none"> <li>• Active membership assured by the workplace</li> <li>• Integration of school learning and workplace learning</li> <li>• Working together with employees and teachers</li> <li>• Guidance and assessment (e.g self-assessment + 3-partite assessment)</li> </ul>	<p><i>Factors related to teachers:</i></p> <ul style="list-style-type: none"> <li>• Strong educational background</li> <li>• Work experience also outside of the university or experience in project work with workplace partners</li> </ul> <p><i>Factors related to the context:</i></p> <ul style="list-style-type: none"> <li>• Positive attitude of both the university and workplaces toward the development of work-integrated learning</li> <li>• Broader, multidisciplinary and continuing learning environments</li> </ul>	<p><i>Factors related to workplace partners:</i></p> <ul style="list-style-type: none"> <li>• Varied work experience and education</li> <li>• (Varied) interest in the development work with the university</li> </ul> <p><i>Factors related to the context:</i></p> <ul style="list-style-type: none"> <li>• Social responsibility</li> <li>• Expected benefit for the organization</li> </ul>

# Predictor variables for students' perceived workplace learning outcomes ( $R^2=50\%$ ) (Virtanen, Tynjälä & Eteläpelto 2014)



1. Active membership ensured by the workplace .226
2. Integration between school learning and workplace learning .196
3. Invention orientation .196
4. Learning orientation .161
5. Self-assessment of one's own work .149
6. Availability of individual guidance .147
7. Guidance concerning student's development and assessment .126

(Orange= social, institutional and structural features of workplace  
Green = educational practices  
Violet = student related individual factors)

# Process factors (= activities)



Students	Teachers	Workplace partners
<ul style="list-style-type: none"><li>• <b>Collaborative learning</b> with other students and workplace employees</li><li>• <b>Authentic problem solving</b></li><li>• <b>Taking own responsibility</b> for learning and actions</li><li>• <b>Reflection on experiences</b></li><li>• <b>Integration of theory and practice</b> (sometimes missing)</li></ul>	<ul style="list-style-type: none"><li>• <b>Guidance of collaborative learning</b></li><li>• <b>Working together</b> with students (and teacher colleagues)</li><li>• Assigning <b>tasks for integrating theory and practice</b> (sometimes missing)</li><li>• Networking and <b>collaboration</b> with workplaces</li></ul>	<p>Either:</p> <ul style="list-style-type: none"><li>• <b>Working together</b> with students as a mentor or an expert guide or a learner</li><li>• <b>Learning</b> about guidance needs and students' task planning, or the subject of the project</li></ul> <p>Or:</p> <ul style="list-style-type: none"><li>• Taking care of <b>agreements</b></li></ul>



Commerce and administration ( $R^2= 59$  %):

- 1) Integration of school learning and workplace learning
- 2) Active membership in workplace
- 3) Availability of individual guidance
- 4) Invention orientation
- 5) Self-assessment of one's own work
- 6) Initiative orientation
- 7) Size of workplace learning site

Social and health care ( $R^2=50$  %):

- 1) Availability of individual guidance
- 2) Integration of school learning and workplace learning  
(=Integrative pedagogy)
- 3) Active membership in workplace
- 4) Invention orientation
- 5) Discussions with the workplace trainer
- 6) Setting goals for workplace learning period
- 7) Discussion with teachers

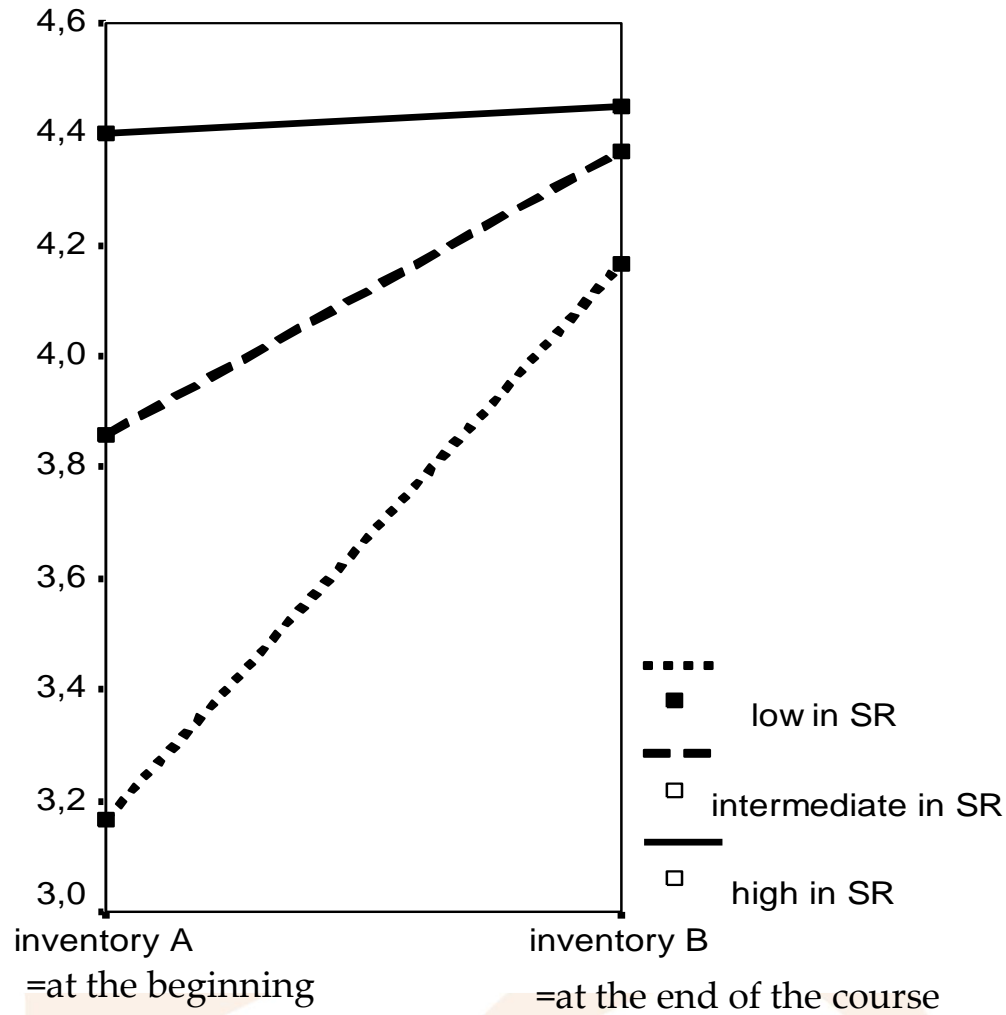
# Product factors (= outcomes)



Students	Teachers	Workplace partners
<ul style="list-style-type: none"> <li>• Independence</li> <li>• Strengthening of professional identity</li> <li>• Domain-specific <b>knowledge</b> and skills</li> <li>• Generic skills (e.g., <b>group/team work, planning, coordination, learning, self-assessment, thinking, reflection and communication skills</b>)</li> <li>• <b>Responsibility</b></li> <li>• <b>Development orientation</b></li> <li>• Increased motivation</li> <li>• <b>Critical reflection</b></li> <li>• Workplace practices (e.g., rhythm of working life)</li> <li>• Acting as expert</li> <li>• Networking</li> </ul>	<ul style="list-style-type: none"> <li>• Skills and knowledge development in students</li> <li>• Increased motivation of students</li> <li>• Decreased dropout of students</li> <li>• Closer and deeper relationship with workplaces</li> <li>• Professional development as a teacher (knowledge on changing competence demands; new ways of working as a teacher, new skills)</li> </ul>	<ul style="list-style-type: none"> <li>• Satisfaction at collaboration with educational institutes</li> <li>• Development of products and services</li> <li>• <b>Reflection on and renewal of old practices</b></li> <li>• <b>Increasing interest in learning</b> and professional development among employees</li> <li>• New knowledge from students and teachers</li> <li>• Help in recruitment of new employees</li> <li>• Help in rush seasons</li> </ul>

# Intrinsic motivation during a project-based course

(Helle, Tynjälä, Olkinuora & Lonka 2007)



SR=self-regulation

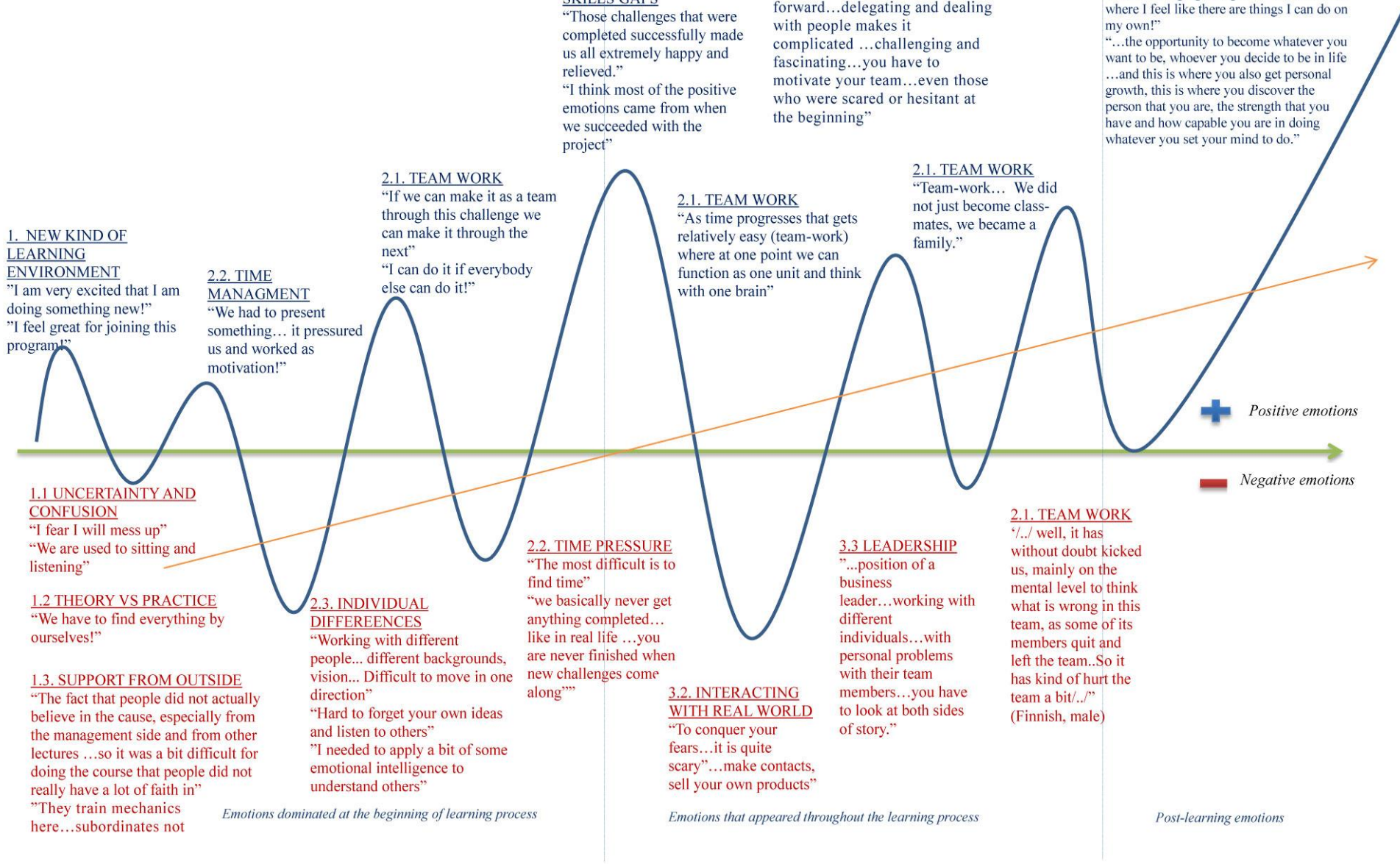


# Challenges in work-integrated learning



# Students: emotions

Arpiainen, et al. (2013).



**1. NEW KIND OF LEARNING ENVIRONMENT**  
 "I am very excited that I am doing something new!"  
 "I feel great for joining this program!"

**2.2. TIME MANAGMENT**  
 "We had to present something... it pressured us and worked as motivation!"

**2.1. TEAM WORK**  
 "If we can make it as a team through this challenge we can make it through the next"  
 "I can do it if everybody else can do it!"

**1.1 UNCERTAINTY AND CONFUSION**  
 "I fear I will mess up"  
 "We are used to sitting and listening"

**1.2 THEORY VS PRACTICE**  
 "We have to find everything by ourselves!"

**1.3. SUPPORT FROM OUTSIDE**  
 "The fact that people did not actually believe in the cause, especially from the management side and from other lectures ...so it was a bit difficult for doing the course that people did not really have a lot of faith in"  
 "They train mechanics here...subordinates not

*Emotions dominated at the beginning of learning process*

**3.1 OVERCOMING KNOWLEDGE AND SKILLS GAPS**  
 "Those challenges that were completed successfully made us all extremely happy and relieved."  
 "I think most of the positive emotions came from when we succeeded with the project"

**2.1. TEAM WORK**  
 "As time progresses that gets relatively easy (team-work) where at one point we can function as one unit and think with one brain"

**2.2. TIME PRESSURE**  
 "The most difficult is to find time"  
 "we basically never get anything completed... like in real life ...you are never finished when new challenges come along"

**3.2. INTERACTING WITH REAL WORLD**  
 "To conquer your fears...it is quite scary"...make contacts, sell your own products"

*Emotions that appeared throughout the learning process*

**3.3. LEADERSHIP**  
 "I learned how to manage the team, to be a leader. I had to find different methods and use techniques to motivate the team members to work for our vision"  
 "You have to be the leader to drive the company forward...delegating and dealing with people makes it complicated ...challenging and fascinating...you have to motivate your team...even those who were scared or hesitant at the beginning"

**2.1. TEAM WORK**  
 "Team-work... We did not just become classmates, we became a family."

**3.3 LEADERSHIP**  
 "...position of a business leader...working with different individuals...with personal problems with their team members...you have to look at both sides of story."

**2.1. TEAM WORK**  
 "...well, it has without doubt kicked us, mainly on the mental level to think what is wrong in this team, as some of its members quit and left the team..So it has kind of hurt the team a bit..."  
 (Finnish, male)

*Post-learning emotions*

**1 NEW KIND OF LEARNING ENVIRONMENT**  
 "...as an opportunity to learn about yourself... Not only as a person but as someone who can contribute to the society and economic situation of your country."  
 "Indeed, it has been the most amazing journey I have ever undertaken in my life!"  
 "... it all affected our learning ...the most valuable thing I got ... greater self-assurance where I feel like there are things I can do on my own!"  
 "...the opportunity to become whatever you want to be, whoever you decide to be in life ...and this is where you also get personal growth, this is where you discover the person that you are, the strength that you have and how capable you are in doing whatever you set your mind to do."





→ It is important to prepare students to cope with emotionally charged and challenging situations and provide support during their work experience



# Lack of integration between theory and practice



- It is important to guide students to reflect on workplace practices with the light of theoretical knowledge
- individual reflection
- peer reflection
- technological tools
  
- Before, during and after work experience (Billett 2015)





# Teachers: changing work

- Renewal of pedagogy: less lecturing, more guiding
  - From individual to networked working
  - Difficulty to 'control' work-based learning
  - Variation in the 'quality' of workplaces
- 
- Need of new skills and competences → professional development

“From sage on the stage to guide on the side”



# Workplaces: guidance and collaboration practices



- Supervision / guidance / mentoring of students
  - Variation in skills of students
  - Mentors' insufficient knowledge about curricular goals
  - Different time schedules between education and work
- Negotiations and agreements



# Challenges of work-related learning - summary



Students	Teachers	Workplaces
<ul style="list-style-type: none"> <li>• New experiences</li> <li>• Sometimes: insufficient guidance by workplace trainers/mentors</li> <li>• Sometimes: negative experiences of work communities</li> </ul> <p>→ Anxiety, uncertainty, insecurity, self-consciousness and other negatively experienced emotions</p>	<ul style="list-style-type: none"> <li>• Teachers competence in work-related learning</li> <li>- Changes in the relationship between education and work →</li> <li>- From individual to networked work</li> <li>- Renewal of pedagogy</li> <li>- Need of new skills</li> <li>• Difficulty to ‘control’ work-related learning = quality assurance</li> <li>• Lack of available workplaces and variation in their quality</li> </ul>	<ul style="list-style-type: none"> <li>• Guidance of students takes time</li> <li>• Lack of knowledge on curricular goals</li> <li>• Variation in skills of students</li> <li>• Different time schedules between education and work</li> </ul>

# Recommendations for work-integrated learning

(Billett et al., 2007; Tynjälä et al., 2021; Zitter et al., 2021)



**Maintain connections** between the university and workplace: partnership work

**Make an agreement** about goals, guidance and assessment between the university, workplace and student

**Prepare** students: practices, procedures, learning tasks, communication channels...

Encourage **active agency** + provide **guidance** by mentors and teachers

**Assign tasks connecting theory and practice**

**Arrange different** forms of work-integrated learning for beginning and advanced students; take individual needs into account

Encourage **reflection**, give **feedback** and favour **three-partite assessment**

Support teachers' **professional development** and **collaborative working**

**Support workplace** trainers/mentors

Nurture safe, open and dialogical **atmosphere**

**Evaluation** of the quality of work-integrated learning



# Developing generic skills in classroom

(Tynjälä et al., 2016; Virtanen & Tynjälä, 2019, 2021)



What kind of pedagogical methods explain the development of generic skills?



# Predictors of learning of creativity



## Resourcefulness, innovativeness, and creativity ( $R^2 = .364$ )

- 1) Critical inspection of knowledge ( $\beta = .428$ )
- 2) Positive learning atmosphere during the course ( $\beta = .248$ )
- 3) Lecturing (NEGATIVE) ( $\beta = -.163$ )

## Ability to operate in new situations ( $R^2 = .415$ )

- 1) Acting at the interface between theory and practice ( $\beta = .395$ )
- 2) Reading (NEGATIVE) ( $\beta = -.246$ )
- 3) Sharing and utilizing students' earlier experiences and knowledge ( $\beta = .213$ )





# Predictors of learning of thinking and decision making skills



## Critical thinking ( $R^2 = .182$ )

- 1) Critical inspection of knowledge ( $\beta = .426$ )

## Decision making skills ( $R^2 = .321$ )

- 1) Working together with others ( $\beta = .226$ )
- 2) Assessment of other students' work ( $\beta = .223$ )
- 3) Feedback, assessment, and summarizing tasks ( $\beta = .222$ )



# Predictors of problem solving skills



## **Problem-solving skills ( $R^2= .486$ )**

- 1) Acting at the interface between theory and practice ( $\beta= .314$ )
- 2) Reading (NEGATIVE) ( $\beta= -.225$ )
- 3) Working together with others ( $\beta= .212$ )
- 4) Assessment of other students' work ( $\beta= .203$ )

## **Ability to solve occupational problems ( $R^2= .462$ )**

- 1) Acting at the interface between theory and practice ( $\beta= .601$ )
- 2) Working alone (NEGATIVE) ( $\beta= -.220$ )



<http://www.laerdal.fi/document.asp?subnodeid=14925384>



# Predictors of development of lifelong learning skills

## Continuing learning skills ( $R^2 = .236$ )

- 1) Critical inspection of knowledge ( $\beta = .396$ )
- 2) Assessing one's own work ( $\beta = .185$ )

## Self-assessment skills ( $R^2 = .394$ )

- 1) Assessing one's own work ( $\beta = .420$ )
- 2) Feedback, assessment, and summarizing tasks ( $\beta = .286$ )



# Predictors of learning of social skills



## Interaction skills (R<sup>2</sup>= .560)

- 1) Working together with others ( $\beta = .622$ )
- 2) Sharing and utilizing students' earlier experiences and knowledge ( $\beta = .297$ )
- 3) Listening (NEGATIVE) ( $\beta = - .170$ )

## Collaboration skills (R<sup>2</sup>= .569)

- 1) Working together with others ( $\beta = .446$ )
- 2) Feedback, assessment, and summarizing tasks ( $\beta = .223$ )
- 3) Sharing and utilizing students' earlier experiences and knowledge ( $\beta = .203$ )

## Looking at things from other people's perspective (R<sup>2</sup>= .58)

- 1) Feedback, assessment and summarizing tasks ( $\beta = .476$ )
- 2) Working together with others ( $\beta = .258$ )
- 3) Acting at the interface between theory and practice ( $\beta = .335$ )
- 4) Feedback and evaluation given by teacher ( $\beta = -.237$ )





# Conclusions

# Conclusions 1/2



- It is possible to learn generic working life skills both at work and in the classroom
- Vital factors in students' workplace learning: active participation ensured by the workplace, integration of theory and practice (school learning & workplace learning), guidance and feedback + motivation
- Different forms of pedagogy develop different kinds of skills → Diversified pedagogy is needed to support the development of diversified work life skills and knowledge



# Conclusions 2/2



- Traditional forms of teaching and learning (lectures, reading, working alone) seem not to develop generic skills BUT they are still important for acquiring knowledge and developing understanding
- We recommend diverse pedagogy including
  - collaborative and individual working
  - sharing and utilizing students' (previous) knowledge and experiences
  - lectures and reading with learning tasks involving critical reflection and summarizing
  - giving and receiving feedback
  - self- and peer assessment
  - connecting education and work
  - integrating theory and practice
- In the future it is important to examine this kind of pedagogy from the perspective of the development of wisdom





**Thank you  
for your attention !**