



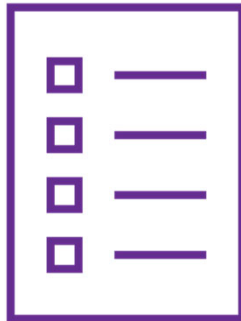
Making learning fun – use of educational games to support project management learning.

IMaR 2022

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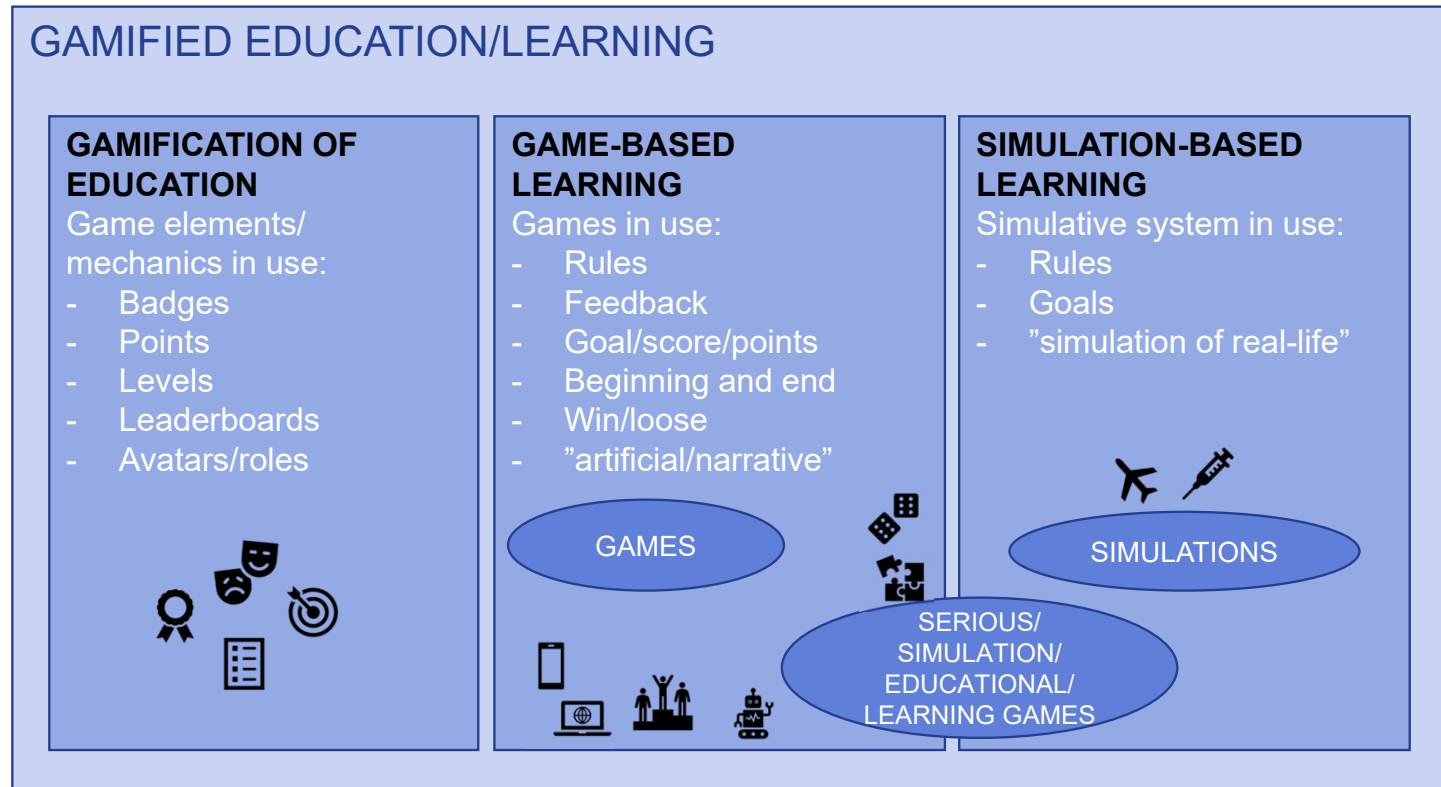
Agenda



- Introduction to Project Business Game
- Integration of game-based learning solutions to teaching
- Available learning solutions



Background





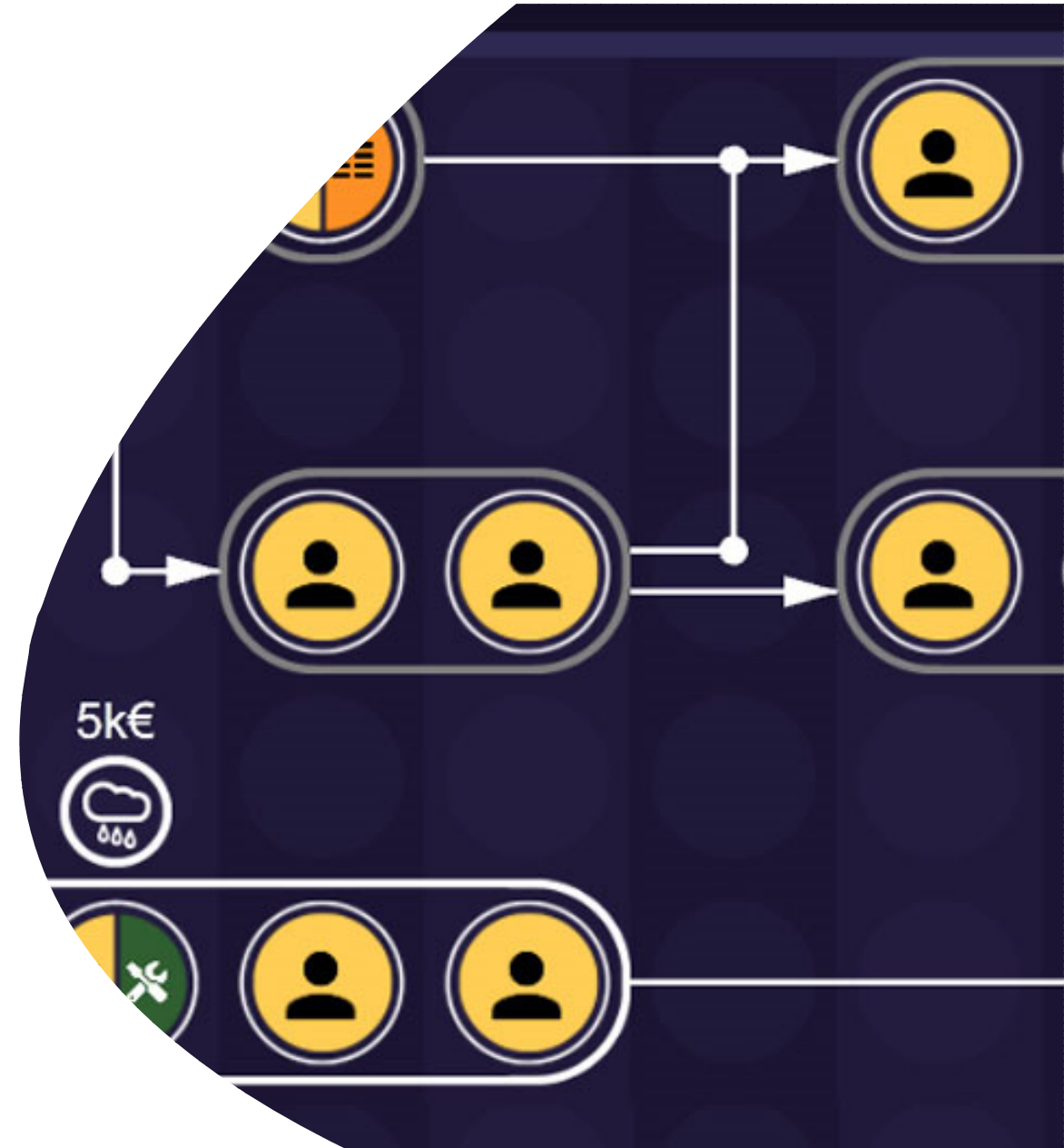
PROJECT BUSINESS GAME

Provo research project (9/2020 – 4/2022)

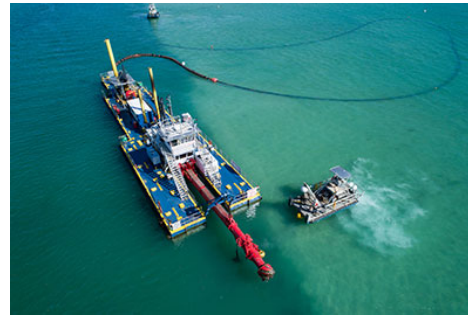
Provo project goal

*To support project management teaching and learning with **configurable** gaming solution incorporated into learning solutions.*

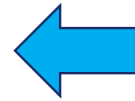
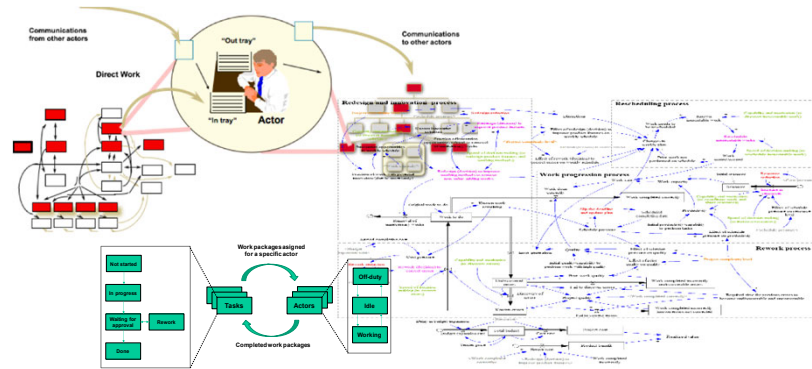
<https://www.pmlearning.fi>



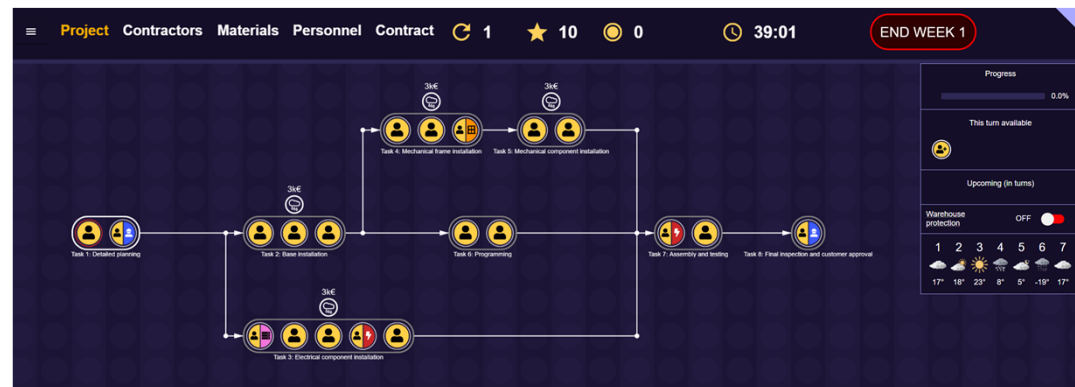
Projectification of society



From real world to simulation and modelling



to virtual game environment

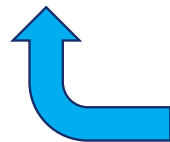
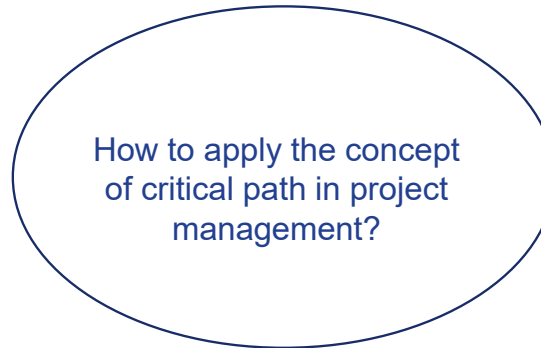
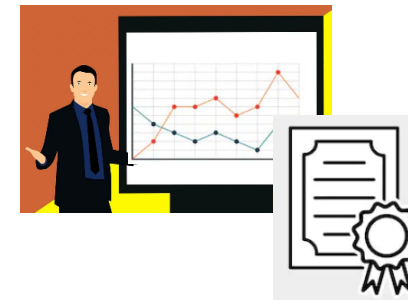


Solutions to meet learning goals

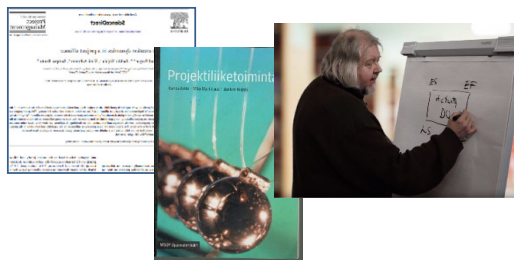
Virtual game environment



Material and tools for teacher



Materials to support learning





Learning solutions

Learning solution is a complete package that includes:

- Materials for students to prepare for the game session
- Game(s) to be played during the game session and teaching materials for teacher to facilitate game session
- Material for post-game reflection including any assignment for students

Example of learning solution:

<https://portal.projectbusinessgame.com>

Learning solution identifier: LS16_trial

Login: guest@oulu.fi

Password: guest@oulu.fi

The screenshot displays the 'LS16 - Project risk management' interface. At the top, it provides instructions from the University of Sydney, School of Project Management, detailing the role of a project manager and the goal of the game. It lists learning outcomes such as recognizing systematic PRM processes, identifying risks, and understanding decision impacts. A pre-assignment section lists tasks like studying instructions, watching videos, and preparing a risk management plan. Below this, the game status is shown as 'Enabled' with a 'Play' button. A summary bar indicates 0 times played, 15 min estimated duration, and an 'Available' status. The main content area contains introductory text and two data tables for 'RANK' and 'POINTS', both showing 'No Data' and a link to 'View all high scores (detailed)'. A second instance of the interface is shown below, but with a 'Disabled' status and a 45 min estimated duration.



Relevant issues to consider in the integration of based learning solutions to teaching



1. What is the **role** of the **learning solution**?
 - Raise curiosity/motivate/engage students
 - Bring variation to teaching/learning methods
 - Encourage socializing and student-to-student learning
 - Apply and elaborate previous knowledge
 - Learn new content (knowledge, skills)
 - Course/module/program built around learning solution
2. How much **time** is **available** for the learning solution?
 - Time allocated for self-study
 - Time allocated for contact teaching
 - Number of contact teaching sessions
3. Which parts of the learning solution are used in **grading**?
 - Pre-assignment
 - Game score/result
 - Specific game events/decisions
 - Debriefing/post-game discussion/reflection
 - Post-assignment
 - None



How to implement learning solutions? – Five typical implementations

*General guidelines and typical workflows for
implementing learning solutions.*



Complete self-study

Students study learning solution materials, play practice game and the official game outside classroom context (independently)

Teacher workflow

- Before students' self-study
 - Provide brief description/introduction of the learning solution and its learning outcomes
 - Provide instructions for portal registration
- During students' self-study:
 - Provide support for students (if required)
 - Review students' game results
- After students' self-study:
 - Review students' post-game reflection survey and/or assignment (if applicable)
 - Grading (if applicable)
 - Complete teacher feedback survey (in portal)

Student workflow

- Self-study:
 - Register in game portal following teacher's instructions
 - Study the learning solution materials following instructions in game portal (individually)
 - Play the practice game to learn game mechanics (individually)
 - Complete pre-assignment and prepare for playing the official game (individually or in groups)
 - Play the official game (individually or in groups)
 - Complete post-game assignment (if required)
 - Reflect on how the expected learning outcomes were achieved (survey in portal)



Self-study-oriented implementation

Students study learning solution materials, play a practice game and the official game outside classroom context (independently) and prepare post-game analyses for discussion in a debriefing session

Teacher workflow

- Before students' self-study
 - Provide brief description/introduction of the learning solution and its learning outcomes
 - Provide instructions for portal registration
- During students' self-study:
 - Provide support for students
 - Prepare for contact teaching session by utilizing learning solution material for teachers
 - Review students' game results and post-game assignments (if applicable)
- Contact teaching:
 - Organize debriefing session
 - Facilitate students' discussion and/or raise issues for discussion by utilizing teacher's debriefing material
- After contact teaching:
 - Review students' post-game reflection survey
 - Grading (if applicable)
 - Complete teacher feedback survey (in portal)

Student workflow

- Self-study:
 - Register in game portal following teacher's instructions
 - Study the learning solution materials following instructions in game portal (individually)
 - Play the practice game to learn game mechanics (individually)
 - Complete pre-assignment and prepare for playing the official game (individually or in groups)
 - Play the official game (individually or in groups)
 - Complete post-game assignment and prepare for the debriefing session (individually or in groups)
- Contact teaching:
 - Participate in debriefing session
 - Students discuss/share their insights from the game and post-game assignment
 - Reflect on how the expected learning outcomes were achieved (survey in portal)



Balanced self-study and contact teaching

Students familiarize themselves with learning solution materials, play a practice game and try the official game outside classroom context (independently), but the official game and analyses take place in a contact teaching session

Teacher workflow

- Before students' self-study
 - Provide brief description/introduction of the learning solution and its learning outcomes
 - Provide instructions for portal registration
- During students' self-study:
 - Provide support for students (if required)
 - Prepare for contact teaching session by utilizing learning solution material for teachers
 - Review students' pre-assignments
- Contact teaching:
 - Organize and facilitate/lead students' game play
 - Facilitate students' post-game discussion and/or raise issues for discussion by utilizing students' game results and teacher's debriefing material
- After contact teaching:
 - Grading (if applicable)
 - Complete teacher feedback survey (in portal)

Student workflow

- Self-study:
 - Register in game portal following teacher's instructions
 - Study the learning solution materials following instructions in game portal (individually)
 - Play the practice game to learn game mechanics (individually)
 - Complete pre-assignment and prepare for playing the official game (individually or in groups)
- Contact teaching:
 - Play the official game (individually or in groups)
 - Prepare for the debriefing (individually or in groups)
 - Students discuss/share their insights from the game
 - Reflect on how the expected learning outcomes were achieved (survey in portal)



Contact teaching-oriented implementation

Students familiarize themselves with learning solution materials and play a practice game outside classroom context (independently), but the official game and analyses take place in contact teaching

Teacher workflow

- Before students' self-study
 - Provide brief description/introduction of the learning solution and its learning outcomes
 - Provide instructions for portal registration
- During students' self-study:
 - Provide support for students
 - Prepare for contact teaching session by utilizing learning solution material for teachers
- Contact teaching:
 - Provide introduction to the learning solution and its learning outcomes
 - Organize and facilitate/lead students' game play
 - Facilitate students' post-game discussion and/or raise issues for discussion by utilizing students' game results and teacher's debriefing material
- After contact teaching:
 - Grading (if applicable)
 - Complete teacher feedback survey (in portal)

Student workflow

- Self-study:
 - Register in game portal following teacher's instructions
 - Study the learning solution materials following instructions in game portal (individually)
 - Play the practice game to learn game mechanics (individually)
- Contact teaching:
 - Prepare for the official game according to teacher's instructions (individually or in groups)
 - Play the official game (individually or in groups)
 - Prepare for the debriefing (individually or in groups)
 - Students discuss/share their insights from the game
 - Reflect on how the expected learning outcomes were achieved (survey in portal)



Complete contact teaching

Students may register in the game portal before contact teaching, but all other learning solution activities, including introduction, practice game, etc. are implemented in classroom context

Teacher workflow

- Before contact teaching:
 - Provide instructions for portal registration
 - Prepare for contact teaching session by utilizing learning solution material for teachers
- Contact teaching:
 - Introduce learning solution, its learning outcomes, case description and game mechanics
 - Organize and facilitate/lead students' game play
 - Facilitate students' post-game discussion and/or raise issues for discussion by utilizing students' game results and teacher's debriefing material
- After contact teaching:
 - Grading (if applicable)
 - Complete teacher feedback survey (in portal)

Student workflow

- Before contact teaching:
 - Register in game portal following teacher's instructions
- Contact teaching:
 - Prepare for the official game according to teacher's instructions
 - Play the official game (individually or in groups)
 - Prepare for the debriefing (individually or in groups)
 - Students discuss/share their insights from the game
 - Reflect on how the expected learning outcomes were achieved (survey in portal)



Example: self-study oriented teaching

Students study learning solution materials, play a practice game and the official game outside classroom context (independently) and prepare post-game analyses for discussion in a debriefing session

Before contact teaching session

- Introduction to learning solution and pre-assignment (15 min)
- Students watch introduction video and play practice game
- Students complete pre-assignment individually (1 week)

Contact teaching session (2-4 h)

- Students prepare for the game in groups
- Students play the game in groups
- Students complete post-game analysis in groups
- Discussion of key learnings and student presentations

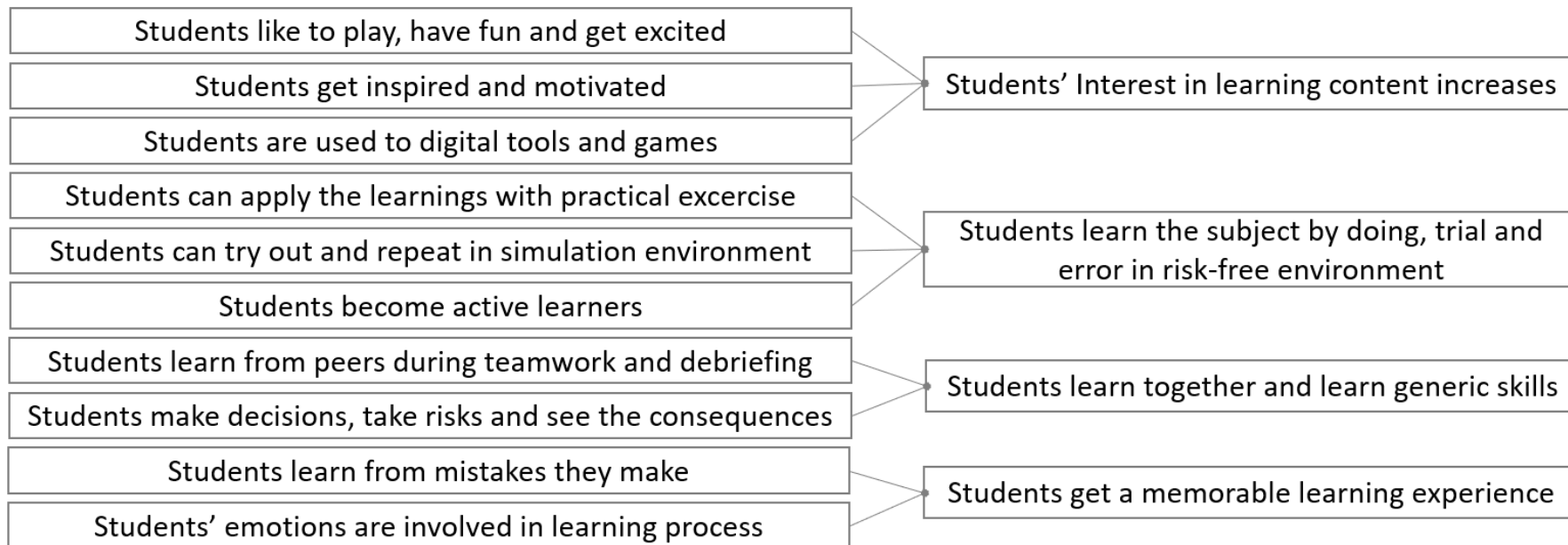
After contact teaching session

- Students prepare an essay of their key learnings individually
- Student essays used for assessment purposes



Why to use game based learning methods?

BENEFITS FOR STUDENTS OF GAMIFICATION/GAME-BASED LEARNING METHODS:



Jääskä, E., & Aaltonen, K. (2022). *Teachers' experiences of using game-based learning methods in project management higher education*. *Project Leadership and Society*, 3, 100041. <https://doi.org/10.1016/j.plas.2022.100041>.



List of learning solutions

In the research project we have designed and implemented over 20 learning solutions, which have been used in over 60 pilot cases (3000+ students). If you are interested to learn more, please contact Jaakko Kujala (jaakko.kujala@oulu.fi) for more information

- LS01 Constructing and operating a chemical plant
 - LS02 Concurrent engineering
 - LS03 Restaurant renovation
 - LS04 Townhouse building project
 - LS05 Production line design and implementation
 - LS06 Project management monitoring and control
 - LS07 Introduction to basic project management
 - LS08 Liquefied gas collector for oil platform
 - LS09 Production line investment project
 - LS10 Critical chain project management
 - LS11 Project sustainability / circular economy
 - LS12 Project portfolio management
 - LS13 Building a new electric station (in Finnish)
 - LS14 Critical path management
 - LS15 Change management*
 - LS16 Project risk management
 - LS17 Agile software project management
 - LS18 Corporate social responsibility
 - LS20 Earned value management
 - LS21 Public procurement of an IT system (In Finnish)
 - LS22 Shipbuilding project (in Finnish)
 - LS25 New product development*
- * Under development



List of publications

- Jääskä, E., & Aaltonen, K. (2022). *Teachers' experiences of using game-based learning methods in project management higher education*. *Project Leadership and Society*, 3, 100041. <https://doi.org/10.1016/j.plas.2022.100041>.
- Jääskä, E., Lehtinen, J., Kujala, J., & Kauppila, O. (2022). *Game-based learning and students' motivation in project management education*. *Project Leadership and Society*, 3, 100055. <https://doi.org/10.1016/j.plas.2022.100055>.
- Jääskä, E., Aaltonen, K., & Kujala, J. (2021). *Game-based learning in project sustainability management education*. *Sustainability*, 13(15), 8204. <https://doi.org/10.3390/su13158204>.
- Jääskä, E., Kujala, J., & Aaltonen, K. (2022). *A game-based learning method to teach Project Management – the case of Earned Value Management*. (submitted to journal October 2022)



Thank you!

Questions?

