



Enhancing Informatics Education through Gamification: A Pedagogical Approach to Motivating and Engaging Students

Jonas Moll, Panagiota Chatzipetrou, Shang Gao
Department of Informatics, Business School, Örebro University

Presentation outline

- Introduction
- Project Aim
- The project setting : Two course cases
- Implications from a practical course case
- Implications from a theoretical course case
- Questions?

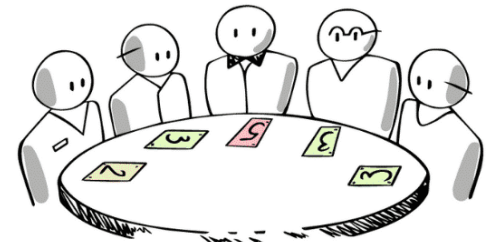
Introduction – the good



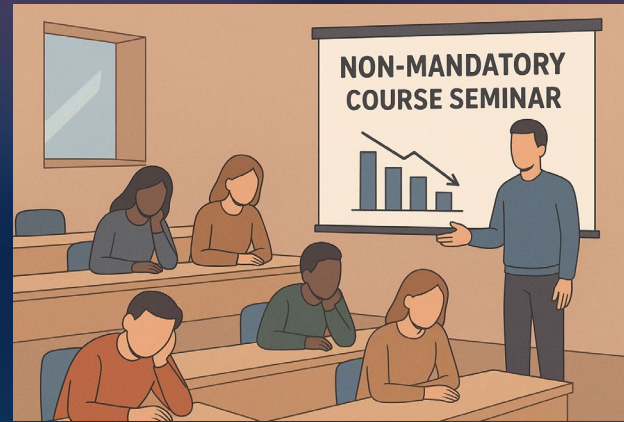
-Gamification is a powerful instrument in the educational process, considering the holistic learning experience



PLANNING POKER



Introduction – the bad



- Workshops and seminars are crucial in higher education for applying theoretical knowledge hands-on
- Students often prioritise studying for final exams
- Low attendance at voluntary sessions

- This focus on exams may help students achieve “better” results
- It limits their deep understanding gained through practical engagement

Project aim



- How can we improve students' motivation and engagement in both theoretical-based courses and practical-based courses in the subject of informatics in terms of gamification?

The project setting : Two course cases

A practical course

The Software Architecture course



System development
bachelor's program



Continuation-level
mandatory courses



Spring 2025



The course aims to
equip students with
the basic knowledge
and skills necessary
for software
architectures and
their role in
developing and
maintaining software
systems

Course modules



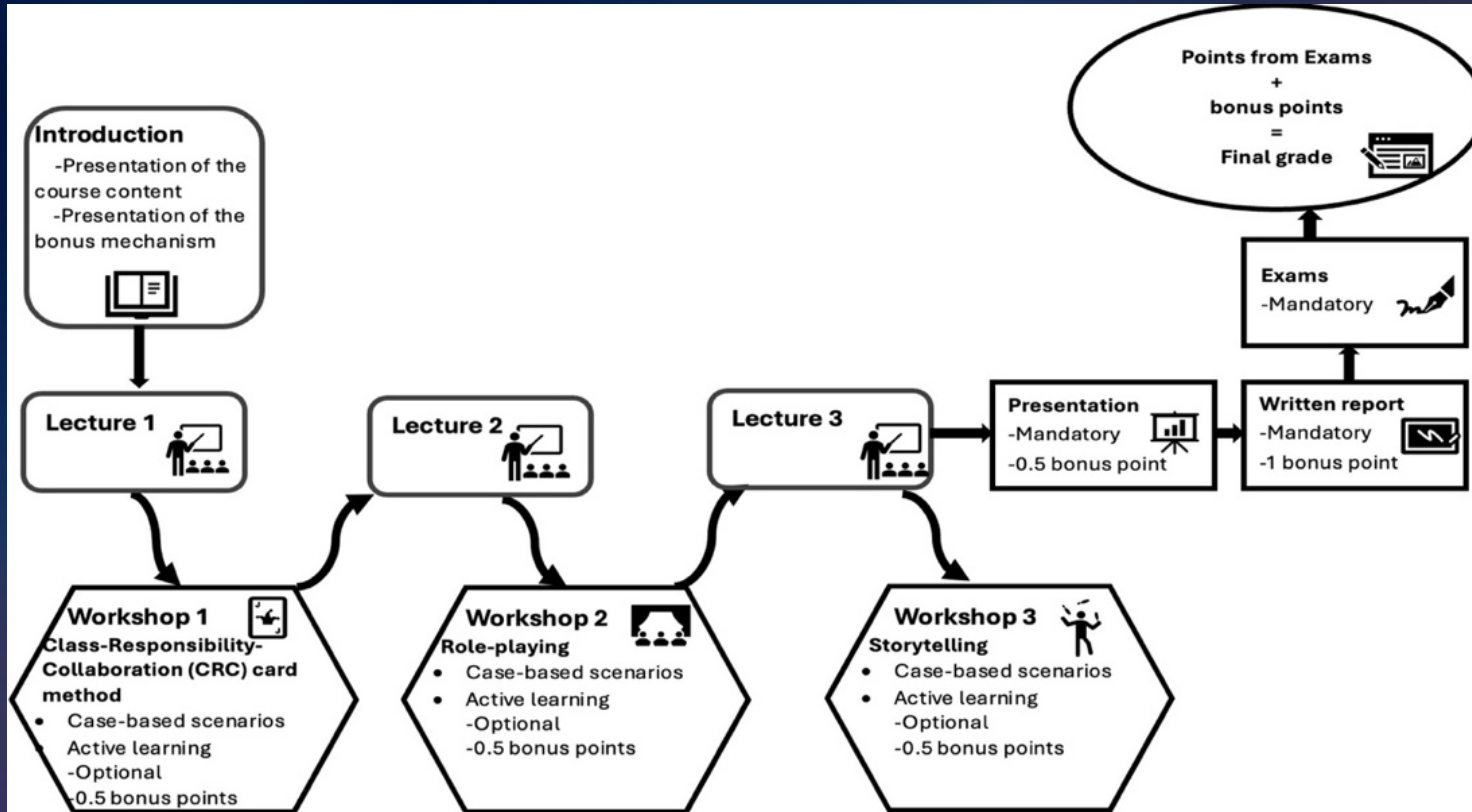
Concepts

The students are introduced to fundamental knowledge and skills in software architecture. They elaborate on software architecture documentation with views in UML and present different architectural styles, tactics, and general principles

Application

In this module, students can actively engage with the theoretical material from the lectures through hands-on modelling, analysis, and secure-aware design of a particular case

The Software Architecture course – Gamified design



Gamified course design

– Gamification elements

Role Playing



Storytelling



Bonus points



Bonus point criteria:

Workshops

Active engagement in preparing the stories
(First hour)

Participants actively contribute to brainstorming and structuring their story. They collaborate effectively with their group, share ideas, and engage in discussion. The preparation phase demonstrates creativity, originality, and fluid teamwork in story development. Participants should also show enthusiasm and take ownership of their storytelling process.

Demonstrating Clear Understanding of the Relevant Concept
(Second Hour – Group Discussion)

The story should accurately integrate and apply the relevant concept. Participants must demonstrate a deep understanding by explaining how their story connects to the topic. The discussion should showcase critical thinking, coherence, and a logical argument. They should also compare and contrast situations with other ideas, considering strengths and weaknesses.

Delivery of the Storytelling
(Presentation, Visual, or Other Media)

The storytelling should be well-structured and engaging. Participants should use appropriate tools such as diagrams, props, or digital presentations to enhance their storytelling. The delivery should be clear, confident, and interactive, capturing the audience's attention. Effective use of voice, tone, and body language is also encouraged to improve communication.

Bonus point criteria:

Oral project presentation

Relevance

- The presentation is highly relevant to the given tasks in the seminar and shows that the students have a thorough understanding about documenting software architecture with UML

Preparation of oral presentation

- The students in the group are very well prepared for the presentation and delivers the presentation in a professional manner

Structure of oral presentation

- The presentation is well structured with introduction, middle and end and clearly illustrated to guide the audience through the presentation

Bonus point criteria:

Written project report

Relevance

- The report is highly relevant to the given tasks in the seminar and shows that the students have a thorough understanding about documenting software architecture with UML

Redability

- There is a very clear structure supporting reading fluency

Relationship between text and graphs

- Text and graphs can complement one another in a very good manner as regar

Lessons learnt

- Lessons learnt are reflected in the report

Coverage

- The main points regarding the selected theory are clearly labeled and very easy to find

A theoretical course

The Theme course



System development
bachelor's program



Advanced-level
mandatory courses



Spring **2026**



The course **equips the students with necessary skills in theory application and argumentation analysis that are needed in the thesis project.**

Basic course setup



Week	Activity	Description
1	Lecture 1	Course introduction with focus on argumenation analysis
	Seminar 1	Argumentation analysis (group assignment)
2	Lecture 2	Argumentation analysis and scientific reasoning
	Seminar 2	Argumentation analysis (group assignment)
3	Lecture 3	Theory application
	Seminar 3	Theory application
4	Writing	Writing on one's own argumentative report
5	Opposition	Review another student's report
	Writing	Compile and submit final report

Gamified design

The theory seminar

Student groups got 1 bonus point to use in the final exam depending on how well they prepared for and presented a theoretical assignment (5 specific "bonus point quality" criteria).

The peer-review

Students got 1 bonus point to use in the final exam depending on the quality of the peer-review of another student's report (2 specific "bonus point quality" criteria).

Implications from a practical course case: Impact on students' learning

The proposed Gamified Course Design:



Motivated students to participate actively and engage in the course



Encouraged positive collaboration among the students



Create moderate stress levels for the students

Implications to Educators from a practical course case

Teaching practice:

- The weight of the maximal bonus points in the final exam should be reasonable
- A gamified course design can be especially beneficial in courses where high students' engagement is difficult to achieve
- The criteria for awarding bonus points need to be clear and transparent



Implications from a theoretical course case

- Implemented with care
- Be clear about the bonus point schema as well as the expectation for awarding bonus point
- Students should be informed about whether they have met the criteria for bonus points and why
- Bonus points were used as the single gamification element used, but survey, feedback suggests exploring other gamification elements in theoretical courses as well!



Thank you!

Questions ? ? ?

