

Gamification in Software Engineering

Prof. Dr. Ulrike Hammerschall
University of Applied Sciences Munich
Department of Mathematics and Computer Science

About me

- Work experience as a software engineer at sd&m (now Capgemini).
- PhD at Technical University Munich (TUM).
- Since 2009 at University of Applied Sciences in Munich.
- Teaching:
 - Programming (in Java), Software Engineering, Requirements Engineering
- Research:
 - Requirements Elicitation, Process Models, Agile Software Development ...

The question ...

Can we use gamification to improve the software development process?



Gamification in the Gartner hype cycle - is the hype over?



Topics

- What is gamification?
- Dynamics, mechanics and components
- Why gamification works
- The gamification process



What is gamification and what is it for?

„The use of game elements and game-design techniques in non-game contexts.“

[Werbach, 2012]

- Motivate behaviour change
- Motivate engagement
- Motivate learning processes
- Motivate problem solving (in teams)



Stack Overflow – ask, help ... and get recognized

Question Badges

Altruist	First bounty you manually award on another person's question	6k awarded
Benefactor	First bounty you manually award on your own question	28.7k awarded

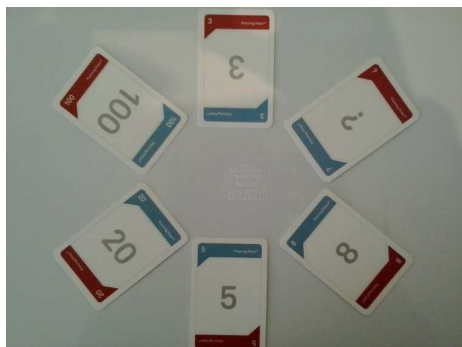
Answer Badges

Enlightened	First to answer and accepted with score of 10 or more	215.8k awarded
Explainer	Edit and answer 1 question (both actions within 12 hours, answer score > 0)	39.2k awarded
Refiner	Edit and answer 50 questions (both actions within 12 hours, answer score > 0)	1.1k awarded
Illuminator	Edit and answer 500 questions (both actions within 12 hours, answer score > 0)	44 awarded
Generalist	Provide non-wiki answers of 15 total score in 20 of top 40 tags	625 awarded

<http://stackoverflow.com/>



Planning Poker – estimate user stories



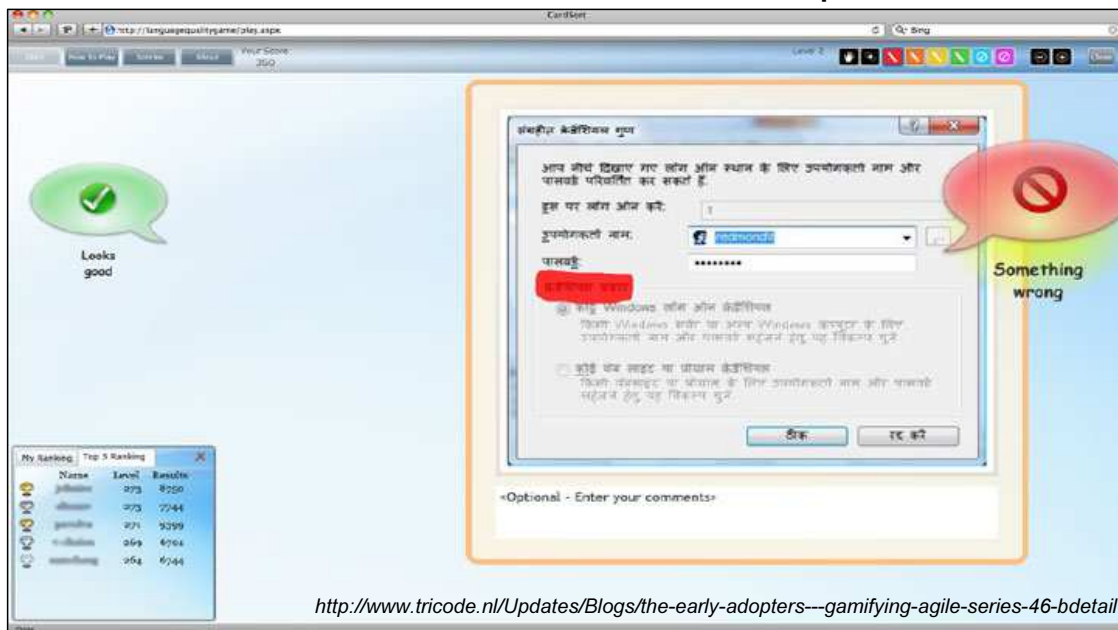
Game duration up to three rounds per user story

Find agreement about estimated effort for user stories.



The Quality Language Game – improve application quality

Find localization bugs in Graphical User Interface

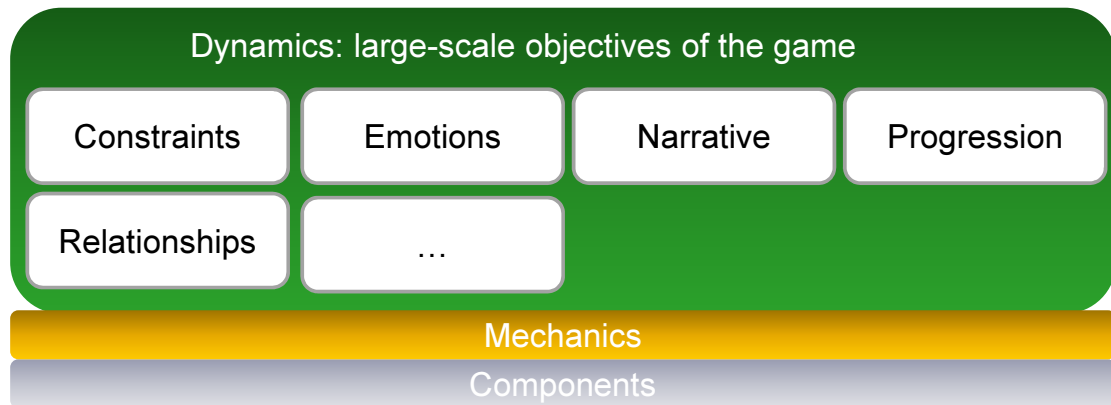


Topics

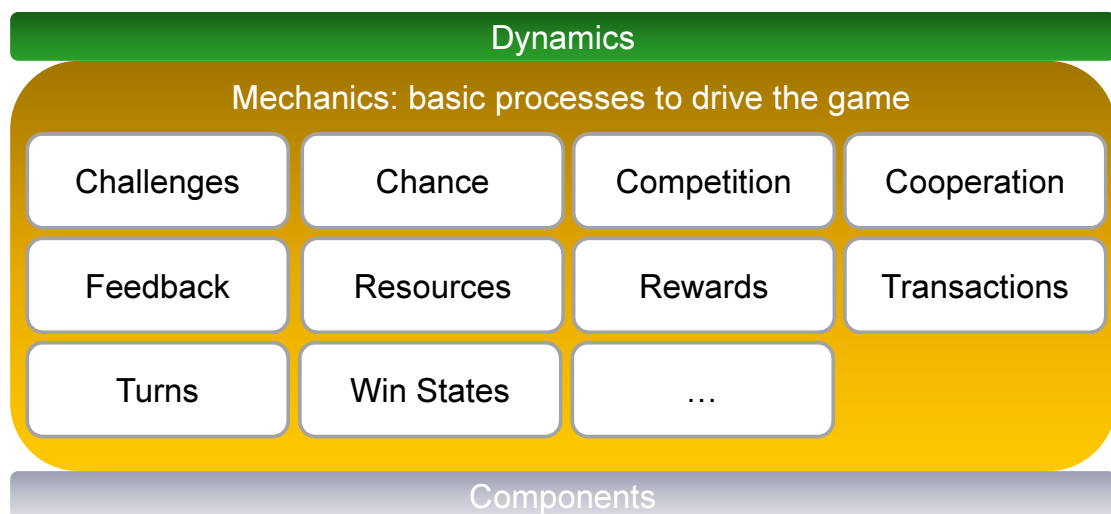
- What is gamification?
- Dynamics, mechanics and components
- Why gamification works
- The gamification process



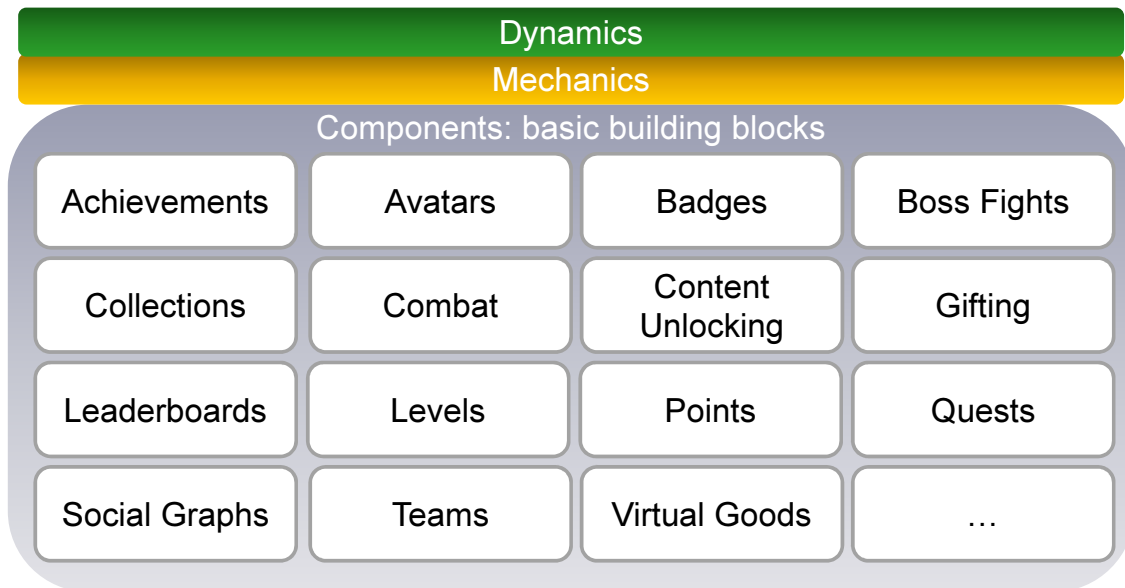
Game elements - Dynamics



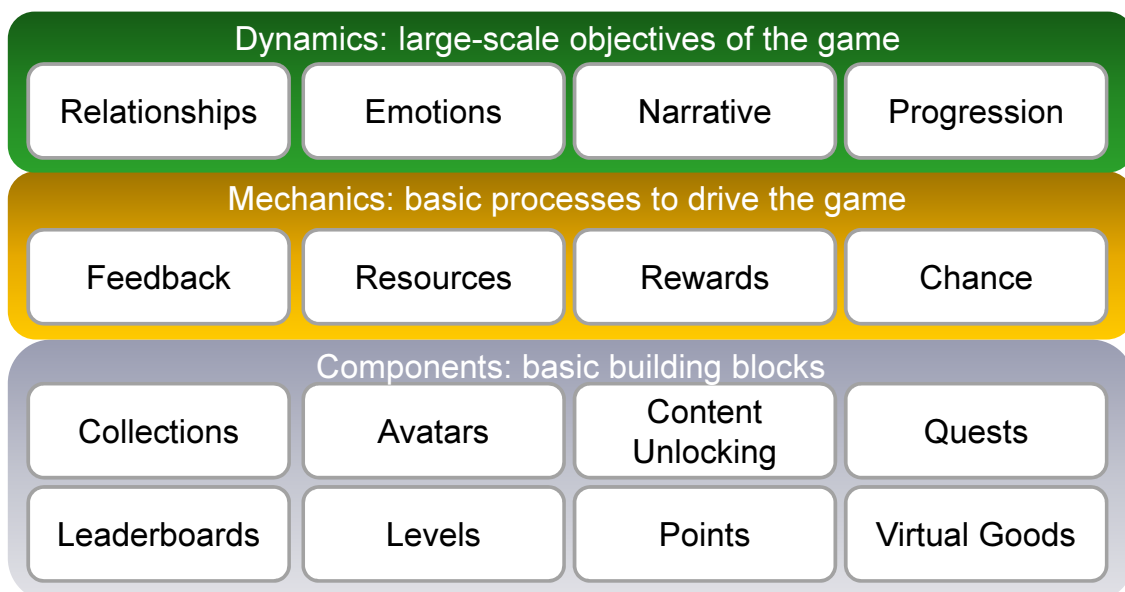
Game elements - Mechanics



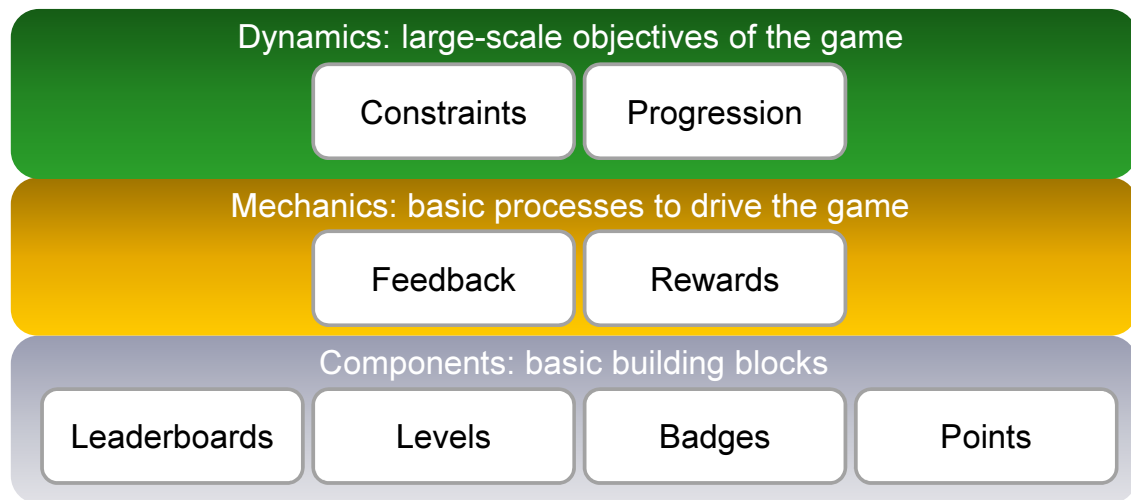
Game Elements - Components



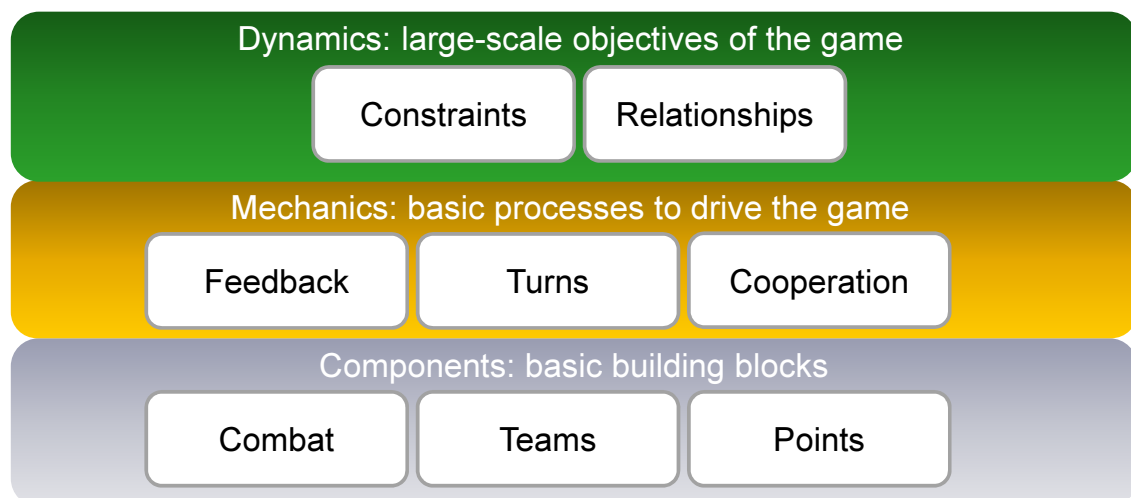
Game elements - EpicWin



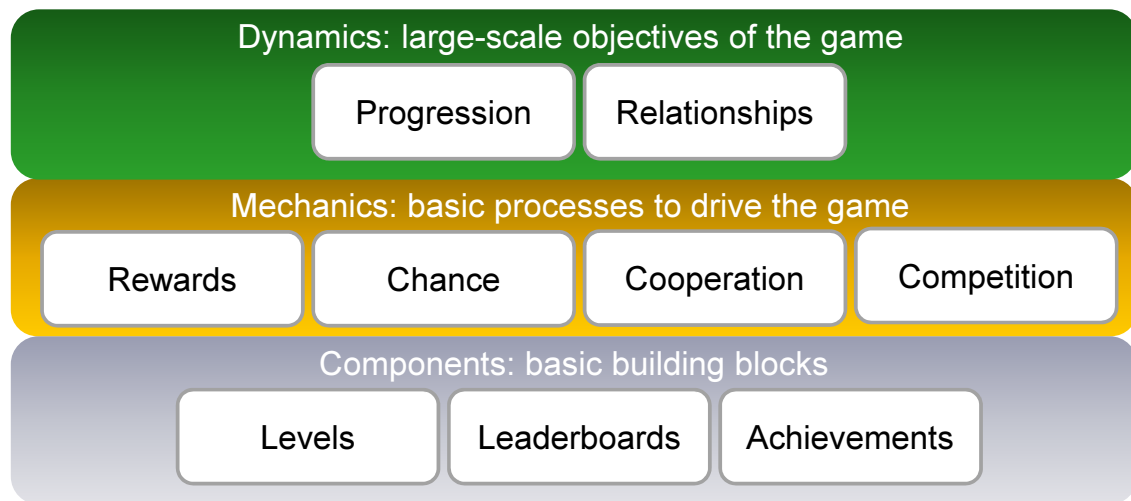
Game elements – Stack Overflow



Game elements – Planning Poker



Game elements – Quality Language Game

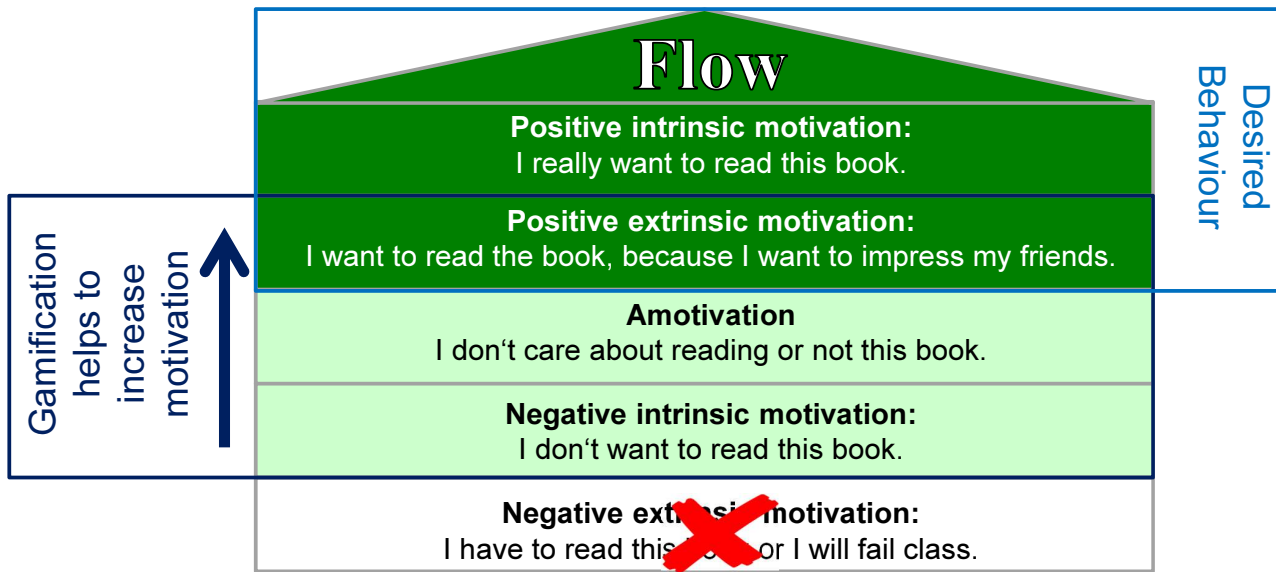


Topics

- What is gamification?
- Dynamics, mechanics and components
- Why gamification works
- The gamification process

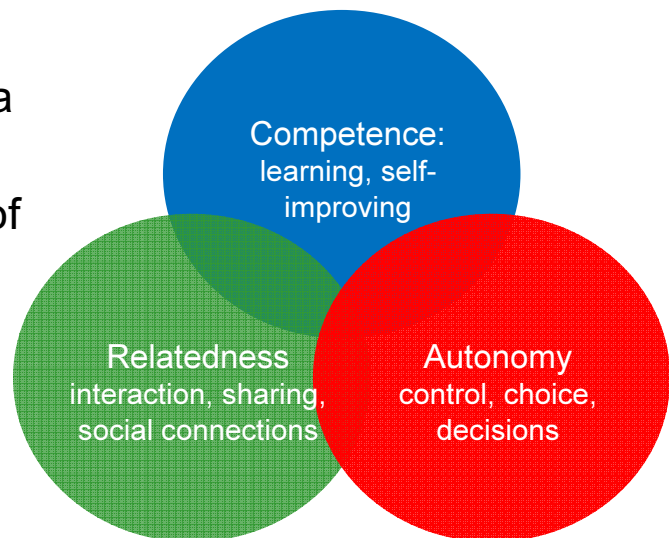


Motivation – a driver for gamification



Self-Determination Theory – a theory on intrinsic motivation

- SDT: Human beings are inherently proactive with a strong desire to growth.
- Precondition is a feeling of
 - Competence
 - Autonomy
 - Relatedness
- Intrinsic motivators!



[Ryan, 2000]



Game elements as intrinsic motivators

- relationships
- competition, cooperation
- leaderboards, teams
- sharing in social networks

Competence:
learning, self-improving

- free choice to enter the game.
- free choice how to play the game.
- different story lines based on decisions.

Relatedness
interaction, sharing, social connections

- progression
- rewards, challenges, feedback
- quests, points, badges, levels

Autonomy
control, choice, decisions



Back to my question ...

Can we use gamification to improve the software development process?



... and a possible answer

- Whenever a high motivation would improve results and the task that has to be done is not motivating by itself.
 - find and validate the best requirements for your system.
 - improve the quality of your artefacts (software / documentation).
 - find in a team the best solution for a problem that cannot be solved by automation.
 - encourage team building and working in a team.
 - share and improve knowledge in a team.
 - ...



Topics

- What is gamification?
- Dynamics, mechanics and components
- Why gamification works
- The gamification process



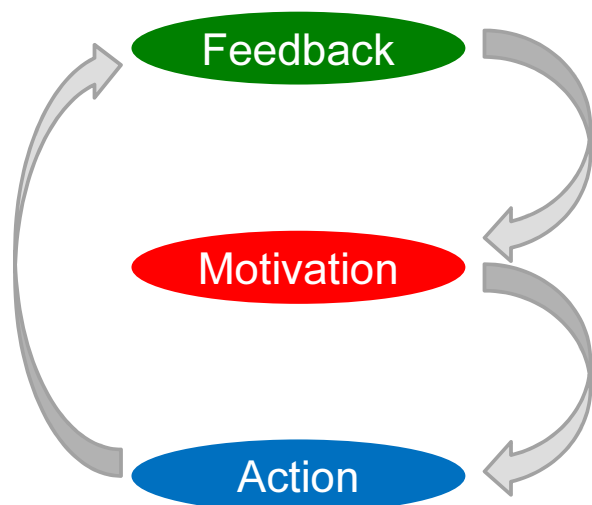
Things that good games do well

- Encourage problem solving
- Sustain interest from novice to expert to master
- break down challenges into manageable steps
- promote team work
- give players a sense of control
- personalize experience to each participant
- reduce fear of failure
- cultivate a confident and optimistic attitude



Process to gamification [Werbach, 2012]

- Define your (Business) goals
- Delineate target behaviour
- Describe your players
- Devise your activity cycles
- Don't forget the fun
- Deploy the tools



A few thoughts on gamification

- Gamification is not only about points, badges and leaderboards.
- Gamification can be a powerful instrument if properly applied.
- Gamification can be discouraging if used in a wrong way.
- Any game – even the best - gets boring after a while, if there are no changes.
- Use game elements but don't talk about it!

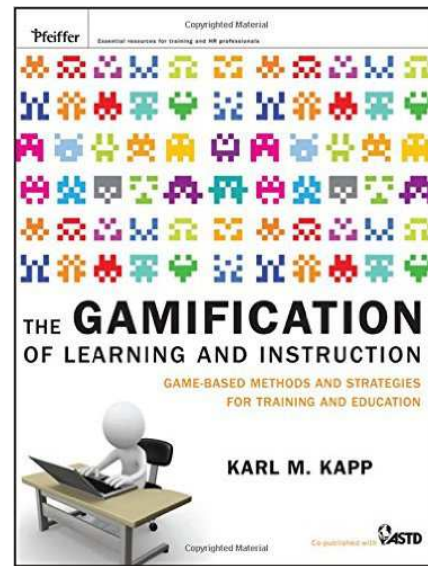
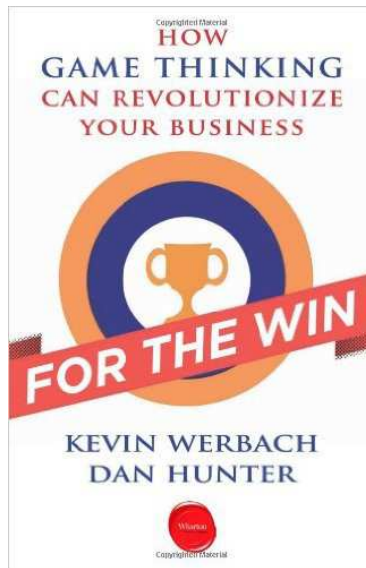


Research into human motivation demonstrates that people will feel motivated by well-designed game features.

[Werbach, 2012]



A good start to learn more about gamification...



References

- [Werbach, 2012] Kevin Werbach, Dan Hunter: For the Win. How Game Thinking Can Revolutionize your Business. Wharton digital press, 2012
- [Kapp, 2012] Karl M. Kapp: The Gamification of Learning and Instruction. Pfeiffer, 2012
- [Hohmann, 2006] Luke Hohmann, Innovation Games: Creating Breakthrough Products Through Collaborative Play, Addison Wesley professional, 1 edition 2006.
- [Koster, 2013] Ralph Koster, A Theory of Fun for Game Design, O'Reilly, second edition, 2013.
- [Deterding, 2011] Deterding, S. et al., From game design elements to gamefulness. In: Lugmayr, A., Franssila, H., Safran, C., Hammouda, I. (eds.) the 15th International Academic MindTrek Conference, p. 9, 2011
- [Ryan, 2000] Richard M. Ryan, & Edward L. Deci, Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. In: American Psychologist 55, 68–78. 2000





HOCHSCHULE
FÜR ANGEWANDTE
WISSENSCHAFTEN
MÜNCHEN

Thank you for your attention!