

Gamification for fun, engagement and learning!

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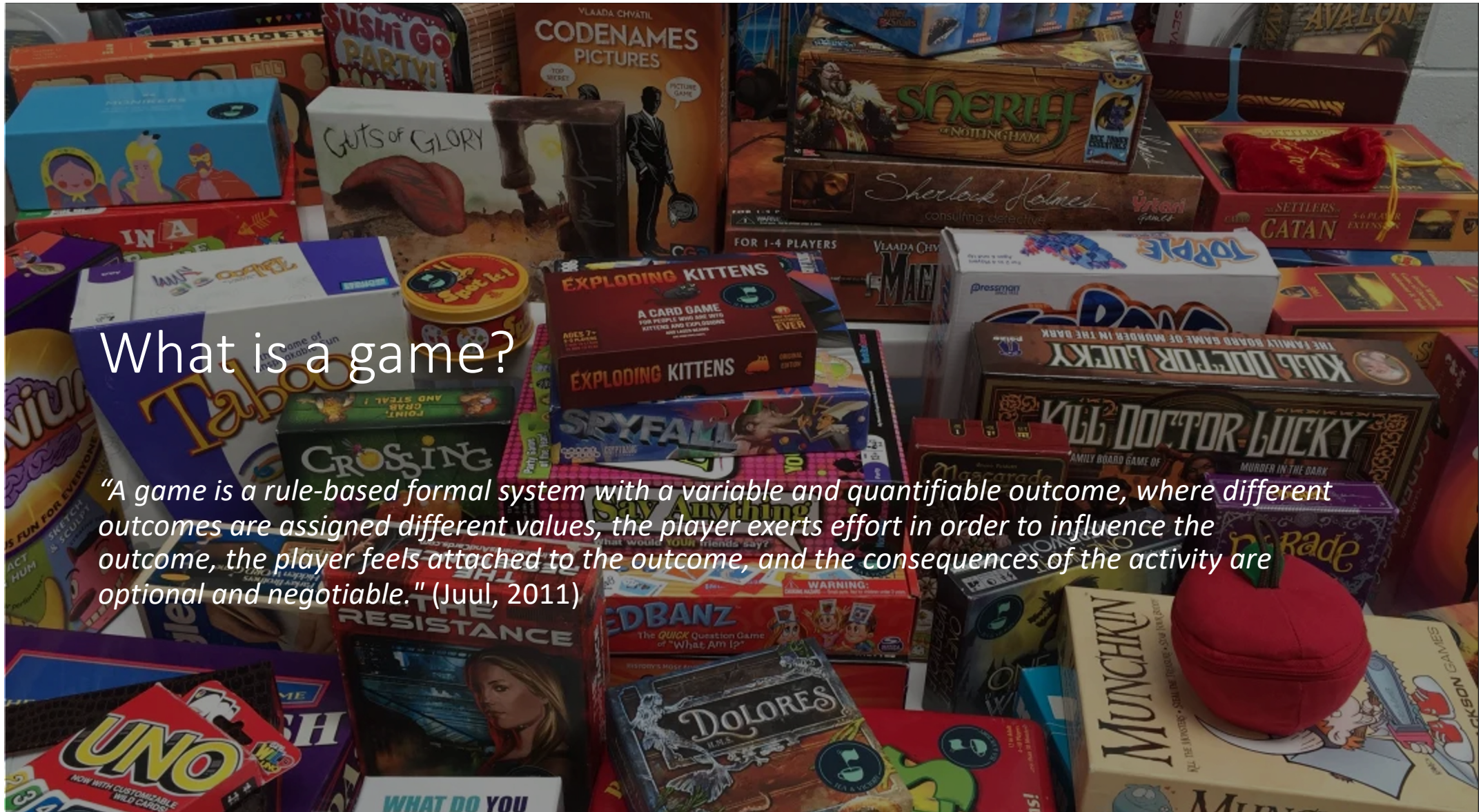
Gamified vs. game-based learning

- Gamified learning
 - Uses elements of game design to construct engaging and playful learning activities.
 - Learning is made game-like.
- Game-based learning
 - Uses games to teach certain knowledge and skills.
 - Learning is expected to occur as a game is played.

There is a lot of ambiguity in definitions of these two terms and what distinguishes them.

See for ex. Landers (2014) & Krath et al. (2021)





What is a game?

"A game is a rule-based formal system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome, and the consequences of the activity are optional and negotiable." (Juul, 2011)

Games and learning

- Primary reason for linking the two is that a good game is engaging:
 - Players are dedicated to do what they can to ensure an optimal outcome.
 - Players are motivated to develop skills and knowledge needed to win the game.
 - A well-designed game can achieve a level of engagement that most teachers only allow themselves to dream of!
- Challenges
 - Making good games is hard!
 - Transferability of game-related skills and knowledge.
 - Overemphasis on game-related rewards.
 - Motivate learning rather than gaming.
 - Assessing what is learned.



Game design

- Several models/approaches exist and can be used on their own or with others, ex.:
 - MDA (Kim, 2015) – Mechanics, dynamics, aesthetics.
 - MSAT (Correa, 2015) – Mechanics, story, aesthetics, technology.
 - Game Design Pillars (Pears, 2017) – Designers define a finite set of critical “pillars” that direct the design of games.
 - And more...
- All models reflect in one way or another key elements of game design:
 - control & interaction (inc. rules)
 - challenge(s) & progression
 - strategy
 - Payoff

Note this list is demonstrative, not exhaustive. See for ex. Bedwell et al. (2012) and Landers (2014) for a more (much more) in-depth discussion about game attributes.

Table 1. Examples of Gamification of Learning by Attribute Category.

Attribute category	Definition	Example of gamification
Action language	The method and interface by which communication occurs between a player and the game itself	To participate in an online learning activity, students are now required to use game console controllers (e.g., a PlayStation controller)
Assessment	The method by which accomplishment and game progress are tracked	In a learning activity, points are used to track the number of correct answers obtained by each learner as each learner completes the activity
Conflict/challenge	The problems faced by players, including both the nature and difficulty of those problems	A small group discussion activity is augmented such that each small group competes for the “best” answer
Control	The degree to which players are able to alter the game, and the degree to which the game alters itself in response	A small group discussion activity is restructured such that each decision made by each small group influences the next topic that group will discuss
Environment	The representation of the physical surroundings of the player	A class meeting is moved from a physical classroom to a 3D virtual world
Game fiction	The fictional game world and story	Lectures, tests, and discussions are renamed adventures, monsters, and councils, respectively
Human interaction	The degree to which players interact with other players in both space and time	Learners participate in an online system that reports on their assignment progress to other students as they work
Immersion	The affective and perceptual experience of a game	When learning about oceanography, the walls of the classroom are replaced with monitors displaying real-time images captured from the sea floor

Examples of Bedwell et al.'s (2012) attributes cited in Landers (2014)

Control & interaction

- This element applies to the rules and tools that define what players can do, what they cannot do, and how they do things:
 - Basic game rules
 - Objects used to facilitate gameplay (e.g. dice, hands, controllers (computer games))
 - Other players



A close-up photograph of a wooden board game. In the foreground, a black ball is positioned on a wooden surface. Behind it, several wooden pieces are scattered, some of which are partially obscured by the ball. The background is blurred, showing more of the wooden board and pieces. The lighting is warm, highlighting the texture of the wood.

Challenges & progression

- This element includes the tasks that players need to complete for the game to move on towards its completion.
- Specific challenges will typically require players to gain and/or use newly acquired skills and knowledge.
- Depending on the scope of the game, challenges may appear in sequences where they become progressively more difficult, continuously requiring updated or newer knowledge and skills.

Strategy

- This element addresses how gamers apply their newly acquired knowledge and skills, with an element of foresight, to advance through stages of gameplay.
- The key factor here is that gamers have opportunities to plan ahead about how they can influence the progress of the game in their favour.



PAYOFF

MACHINE GAME



Payoff (goals & objectives)



- Payoffs are an important motivating element in games. We assume that players want to get some sort of benefit or reward for the hard work that they put into their gameplay.
- Payoffs generally work with challenges and progression in that each challenge carries a reward leading to an ultimate payoff, i.e. winning or successfully completing the game.

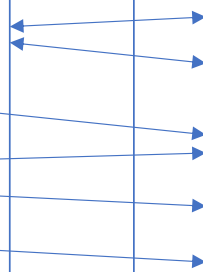
Linking game elements and learning elements

- Key elements of game design:

- control & interaction (inc. rules)
- challenge(s) & progression
- strategy
- payoff

- Key learning elements in game-related contexts:

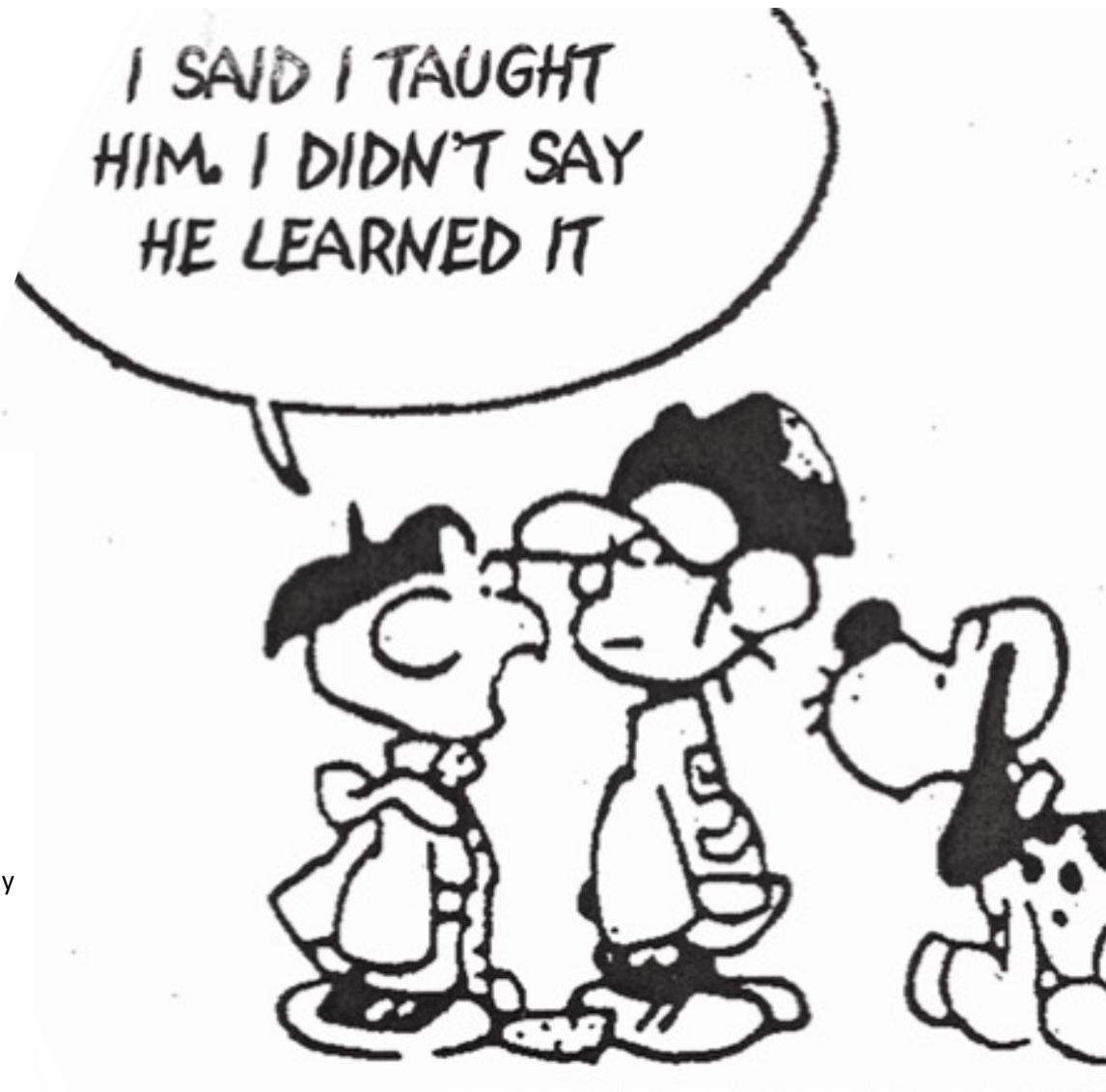
- engagement
- communication
- agency (differentiation)
- retention
- transfer



Assessment & transferability

- Assessing in-game learning
 - How can assessment be built into game elements?
 - fair assessments
 - meaningful assessments (summative or formative)
- Rewards & payoffs are not assessments.
 - Rewards & payoffs are incentives but do not necessarily provide insight into learning.
 - Rewards & payoffs can give a skewed picture of learning outcomes (no proof that “winners” learn more than others).

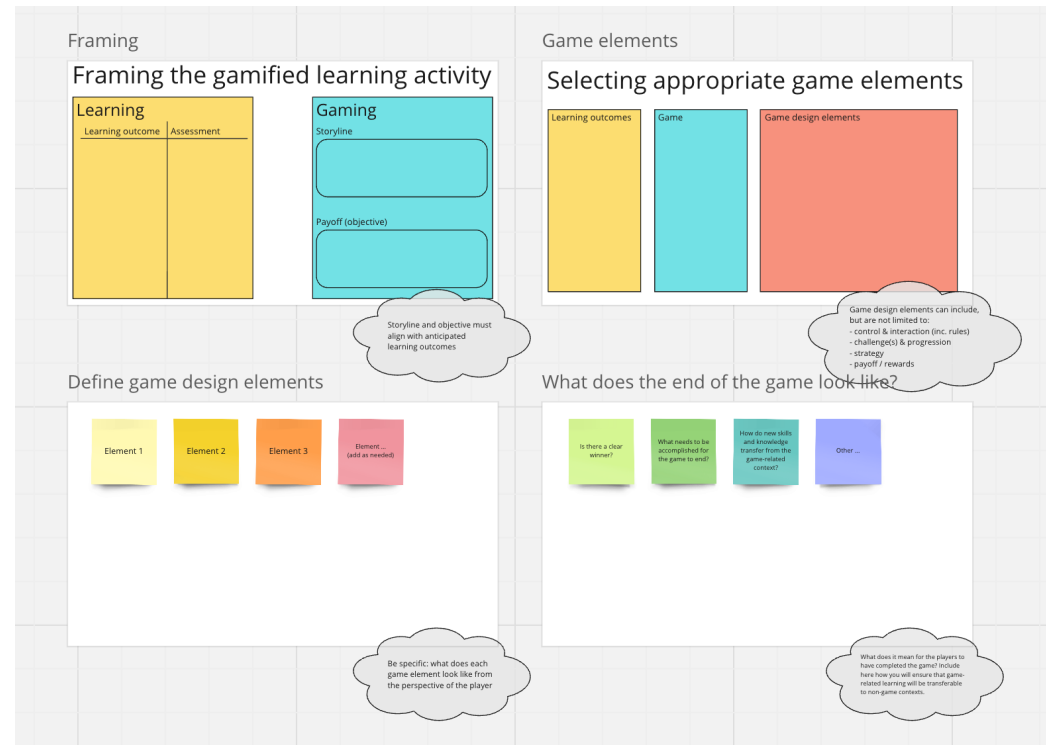
See Caballero-Hernández (2017) for a more in-depth discussion of learning assessment in relation to games.
- Learning is contextual!
 - What is learned in one context does not necessarily transfer directly to others.
 - How do we ensure that knowledge & skills acquired in game contexts prove useful in other contexts?
- Learning is the primary objective – games are just a way to make learning more interesting.
 - Needs to be understood by teachers and students alike.



Workspace for planning gamification

https://miro.com/app/board/uXjVMjzR12U=?share_link_id=54140153917

[In development]



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