

Gamification in Education Workshop

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Preliminaries

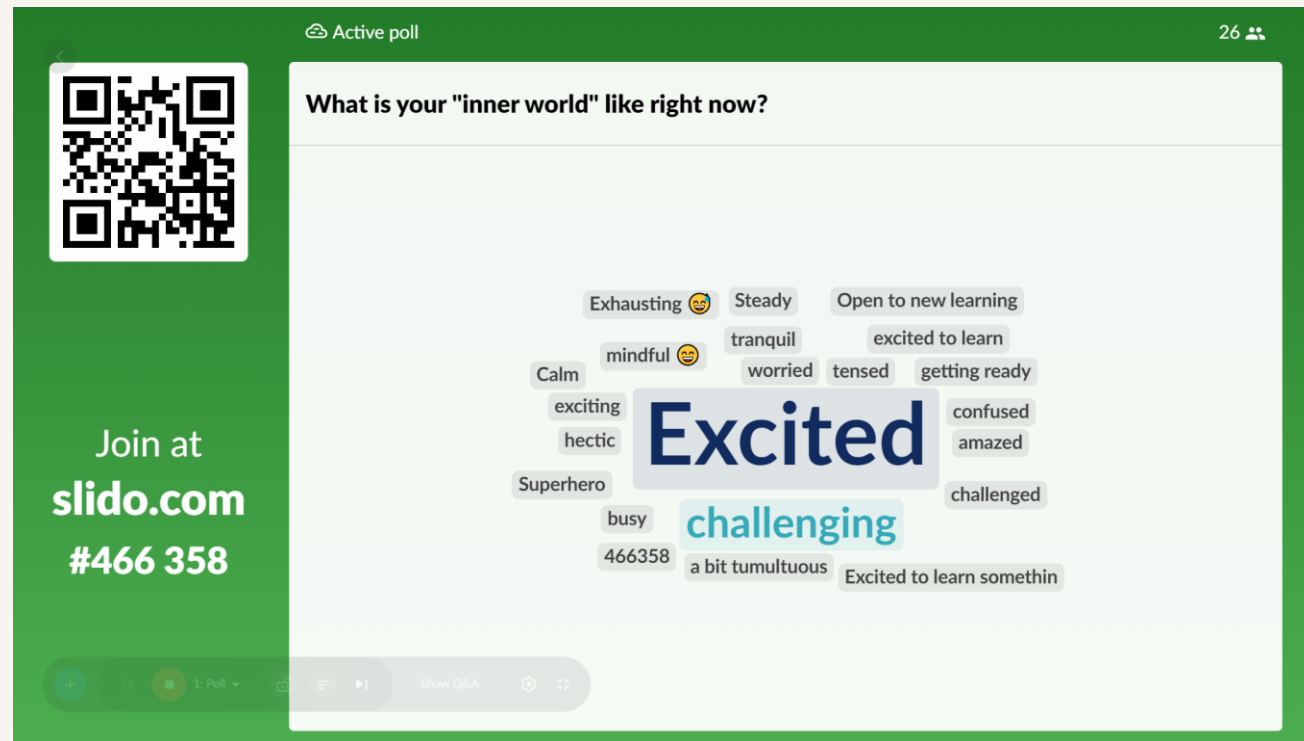
Before we begin this workshop...

By the end of this workshop...

Workshop outline

Before we begin this workshop...

1. Tell us (through Slido) how you feel this afternoon



Active poll 26

What is your "inner world" like right now?

Join at
slido.com
#466 358

Word cloud responses:

- Excited
- challenging
- Exhausting 😞
- Steady
- Open to new learning
- mindful 😊
- tranquil
- excited to learn
- Calm
- worried
- tensed
- getting ready
- exciting
- confused
- amazed
- hectic
- challenged
- Superhero
- busy
- 466358
- a bit tumultuous
- Excited to learn somethin

Show Q&A

Before we begin this workshop...

2. Introduce yourself to the group by saying,
“Hi, everyone! I’m <superhero>.
I’m <superhero’s and your strength>.”

By the way, here’s my favorite submission:



Superman. I believe that we are similar in terms of his enhanced hearing, mental powers, and invulnerability, as I see myself as a keen listener, with a passion for education and an unwavering and resilient drive to never give up in any circumstances. - NM

By the end of this workshop, you will be able to...*

- Explain what educational gamification is and is not;
- Decide the level of granularity and integration of gamification that you would like to achieve (aka your gamification goal);
- Plan a solution to achieve your gamification goal.

*aka Workshop Learning Outcomes (WLOs)

Workshop Outline

Day 1

- Session 1
 - Play
 - Game Elements: Formal
 - Game Elements: Dramatic
 - Dimensions of Gamification
- Break
- Session 2
 - Loose Topic Gamification: What, When, How
 - Examples from Lee-Ann and Kervy
 - Q&A, Reflection, and Sharing

Workshop Outline

Day 2

- Session 1
 - Tight Topic Gamification: Game-based Learning (GBL)
 - GBL Environments: Design
 - Sample GBLE Prototypes by En and Jacob
 - GBL Environments: Evaluation.
- Break
- Session 2
 - Coarse-Grained Gamification: Gamifying Courses
 - Coarse-Grained Gamification: Gamifying Life
 - Q&A, Reflection, and Sharing



Play

Did you know that animals play, too?

Five Criteria of Play in Animals (Burghardt, 2018)

- Incompletely functional
- Voluntary, rewarding, pleasurable
- Modified structurally or developmentally
- Repeated in recognizable form
- Initiated when the animal is not under more than mild stress

Five Criteria of Play in Humans (Gray, 2018)

- Self-chosen and self-directed
- Intrinsically motivating
- Guided by mental rules, but the rules leave room for creativity
- Imaginative
- Conducted in an alert, active, but relatively non-stressed frame of mind



Game Elements

What makes a game a game?

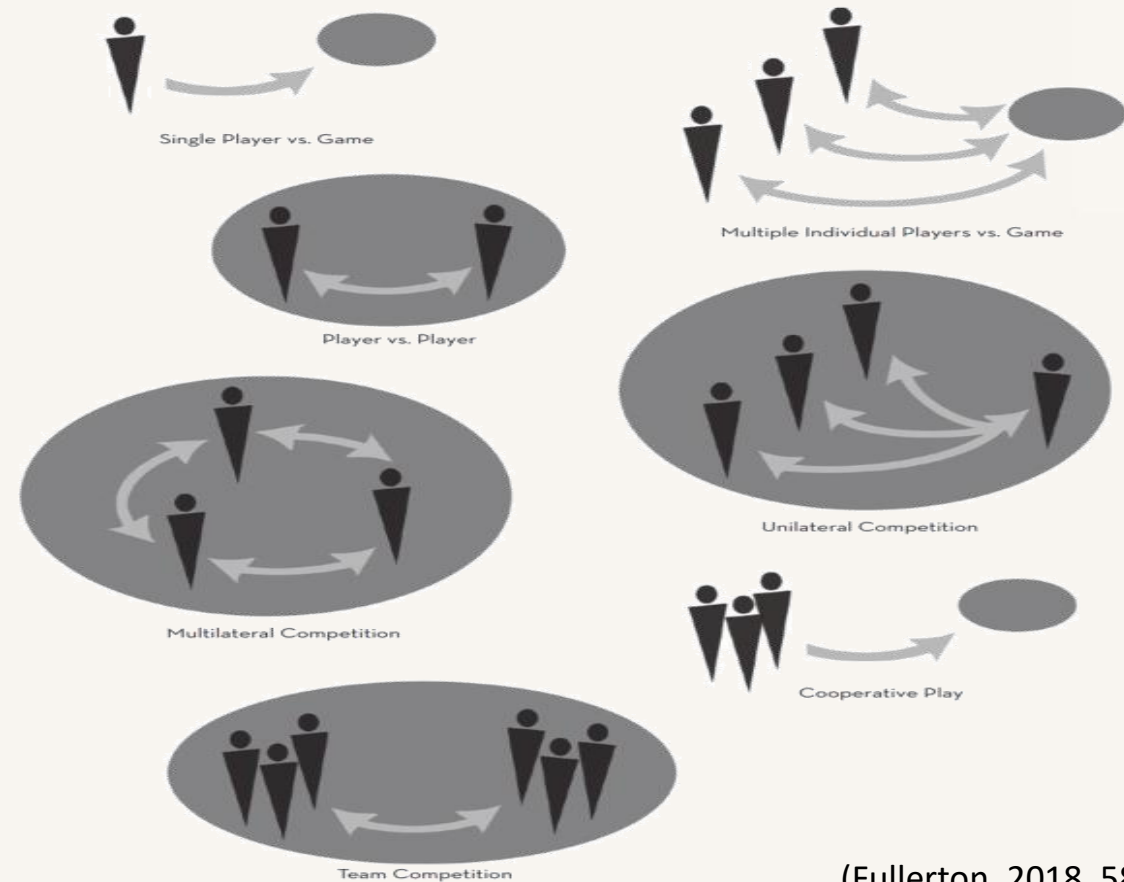
Formal Elements of Games (Fullerton, 2018)

- Players
- Objectives
- Procedures
- Rules
- Resources
- Conflict
- Boundaries
- Outcome

“Without them (formal elements), games cease to be games.” (Fullerton, 2018, 55)

Formal Elements of Games (Fullerton, 2018)

- Players
 - Player Interaction Patterns



(Fullerton, 2018, 58)

Sungka



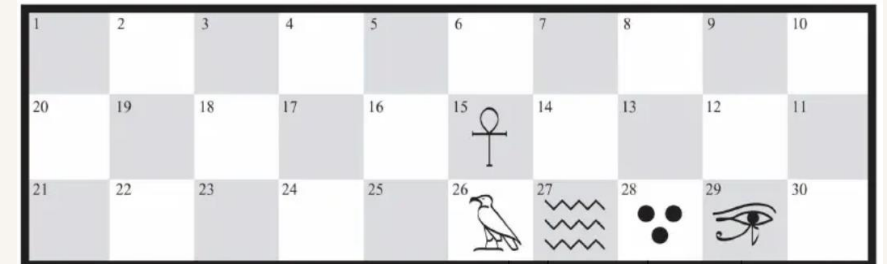
<https://devcomcreatives.wordpress.com/2012/08/15/sungkas-niche-in-philippine-heritage/>

Sungka is a variant of *mancala*, which is said to have originated in North Africa in 3000-1000 BC.

It is the oldest board game that is still being played!

Formal Elements of Games (Fullerton, 2018)

- Players
- Objectives
 - Capture (e.g., Chess)
 - Race (e.g., Senet)
 - Alignment (e.g., Tic-Tac-Toe)
 - Rescue or Escape (e.g., Super Mario Bros.)
 - Construction (e.g., Minecraft)
 - Solution (e.g., puzzle games)



<https://www.metmuseum.org/art/collection/search/548355>

Formal Elements of Games (Fullerton, 2018)

- Players
- Objectives
- Procedures

Super Mario Bros.⁴

Select button: Use this button to select the type of game you wish to play.

Start button: Press this button to start the game. If you press it during play, it will pause/unpause the game.

Left arrow: Walk to the left. Push button B at the same time to run.

Right arrow: Walk to the right. Push button B at the same time to run.

Down: Crouch (Super Mario only).

A Button

Jump: Mario jumps higher if you hold the button down longer.

Swim: When in water, press this button to bob up.

B Button

Accelerate: Press this button to run. If while holding B, you press A to jump, you can jump higher.

Fireballs: If you pick up a fire flower, you can use this button to throw fireballs.

(Fullerton, 2018, 73)

Formal Elements of Games (Fullerton, 2018)

- Players
- Objectives
- Procedures
- Rules
 - Rules Defining Objects and Concepts
 - Rules Restricting Actions
 - Rules Determining Effects

Formal Elements of Games (Fullerton, 2018)

- Players
- Objectives
- Procedures
- Rules
- Resources
 - Lives, Health, Currency, Power-ups, Inventory, Time

Formal Elements of Games (Fullerton, 2018)

- Players
- Objectives
- Procedures
- Rules
- Resources
- Conflict
 - Obstacles, Opponents, Dilemmas

Formal Elements of Games (Fullerton, 2018)

- Players
- Objectives
- Procedures
- Rules
- Resources
- Conflict
- Boundaries
- Outcome

Formal Elements of Games (Fullerton, 2018)

- Players
- Objectives
- Procedures
- Rules
- Resources
- Conflict
- Boundaries
- Outcome

Dramatic Elements of Games (Fullerton, 2018)

- Flow: Challenge and Ability
- Play
- Premise
- Character
- Story
- World Building
- Dramatic Arc



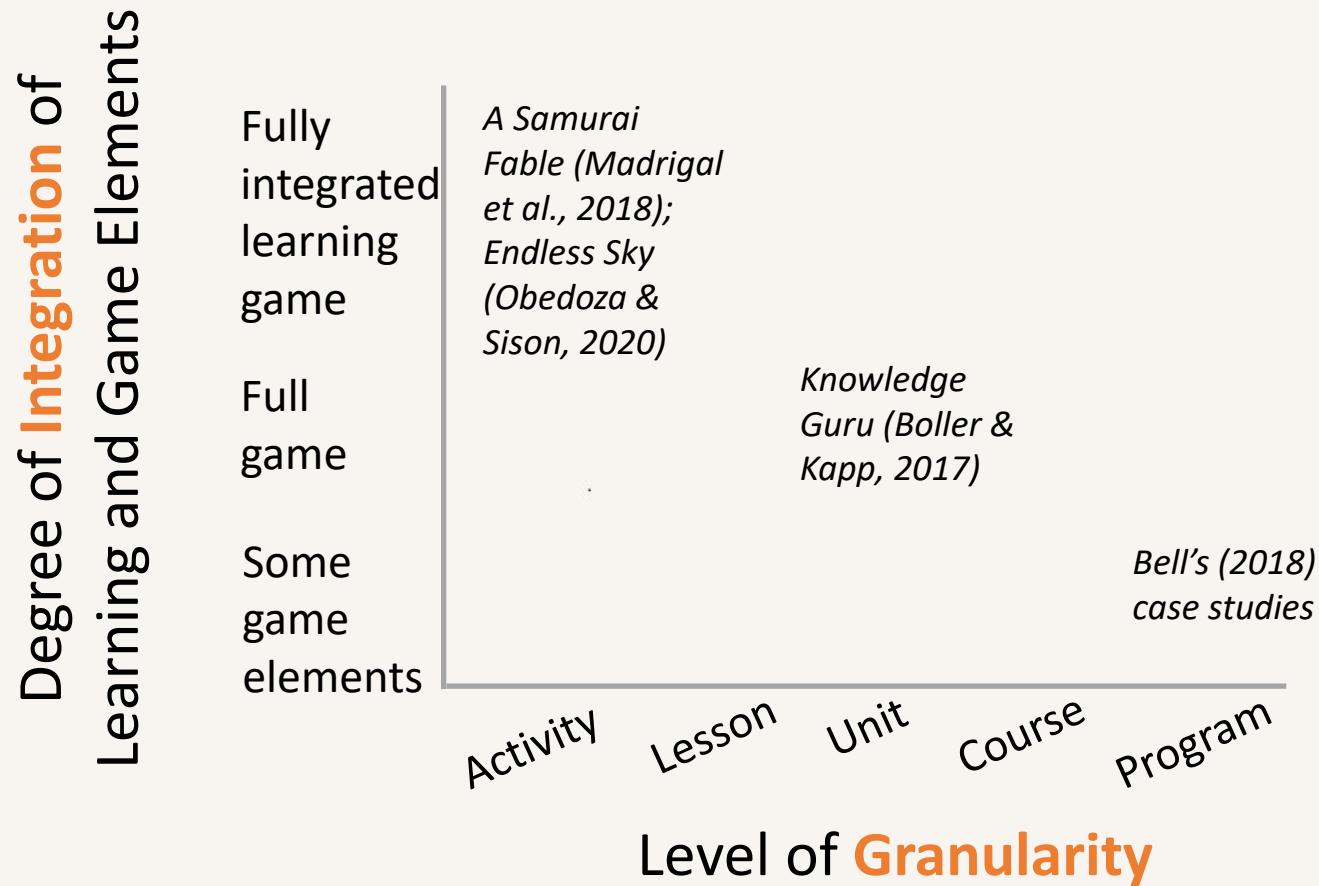
Gamification

What is it?

What is gamification in education?

It is the use of
formal game elements
to make learning
more **engaging**.

Dimensions of Gamification (Sison, 2021)



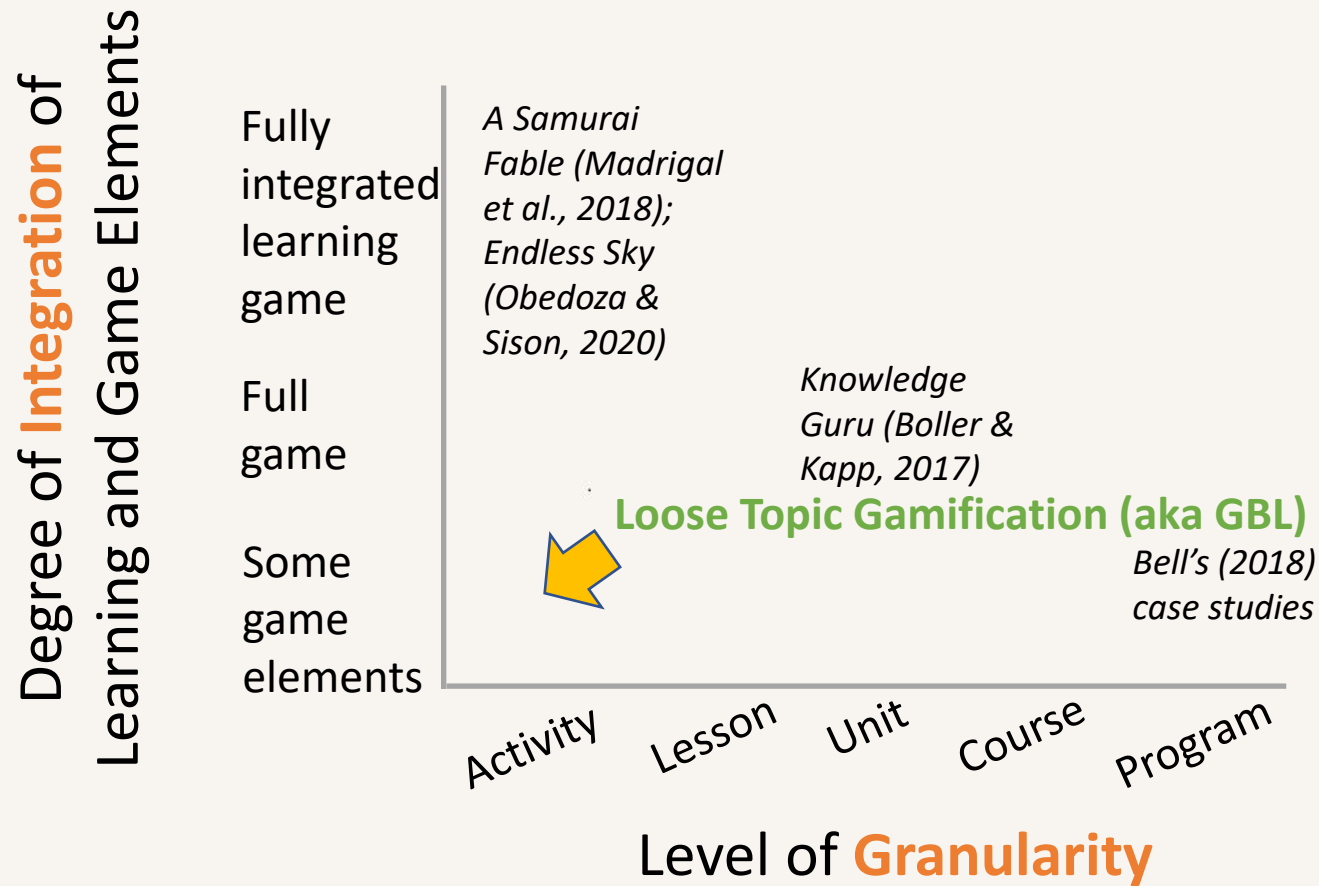


Loose Topic Gamification

What, when, how to gamify

Recap

Dimensions of Gamification (Sison, 2021)



Loose Topic Gamification

- What to gamify
- When to gamify
- How to gamify

Loose Topic Gamification

- What to gamify
 - Which learning competency or outcome to gamify
 - Which activity (teaching-learning activity or assessment activity) to gamify

Which learning competencies tend to more easily gamified?

Why are assessment activities easier to gamify?

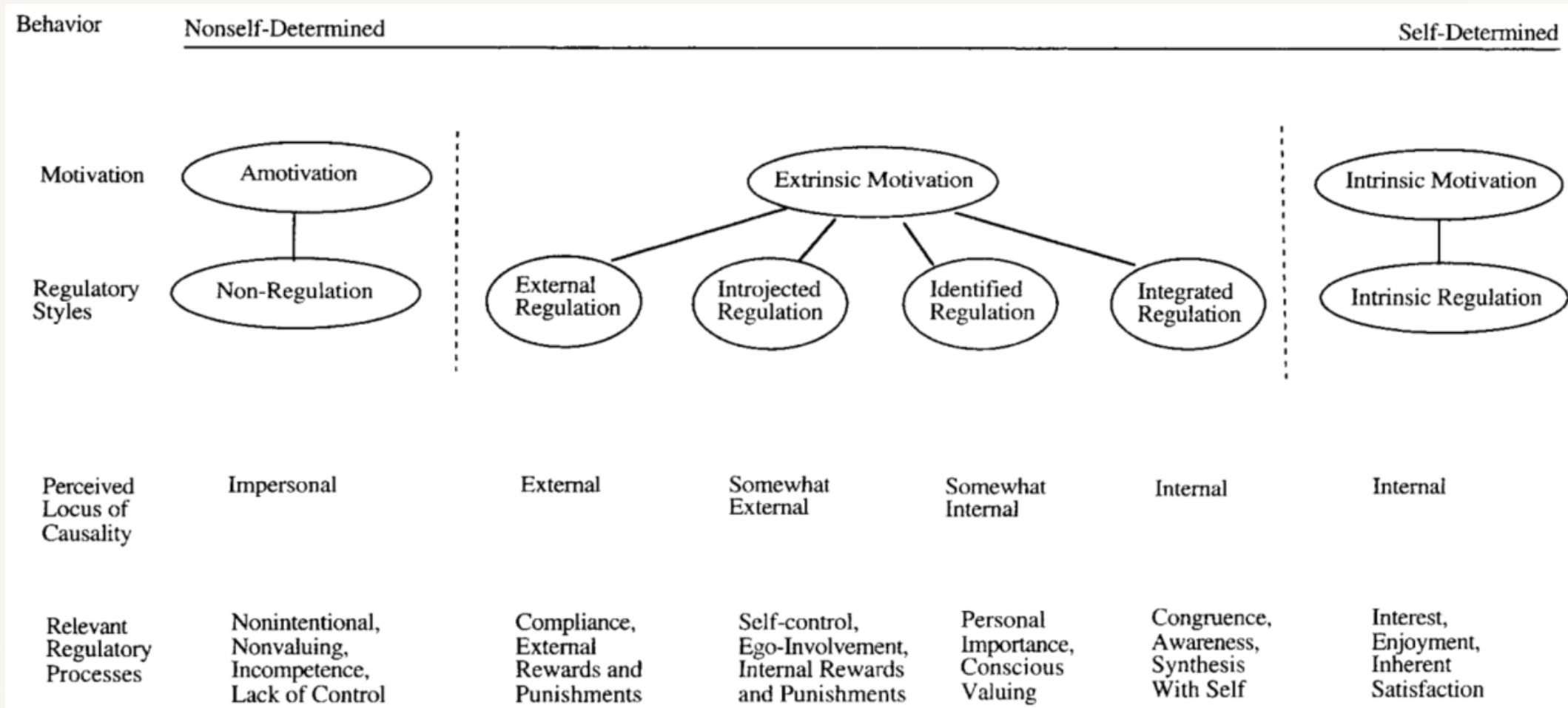
Loose Topic Gamification

- What to gamify
- When to gamify
 - Is the topic boring?
 - Is the topic difficult?

Loose Topic Gamification

- What to gamify
- When to gamify
- How to gamify
 - What is the objective?
 - What are the procedures?
 - What are the rules?


Intrinsic and Extrinsic Motivation



(Ryan & Deci, 2000)

Quiz

Leaderboard



Join at
slido.com
#466 358

Congratulations, Ramel B. Labalan!

#1	Ramel B. Labalan	4/4	0:33
#2	Mark Berou	4/4	0:34
#3	Anna Marlaine Litonjua	3/4	0:26
#4	Pauline	3/4	0:29
#5	Rye	3/4	0:31

Hardest question 42%

Which of the following is not a dramatic game element?



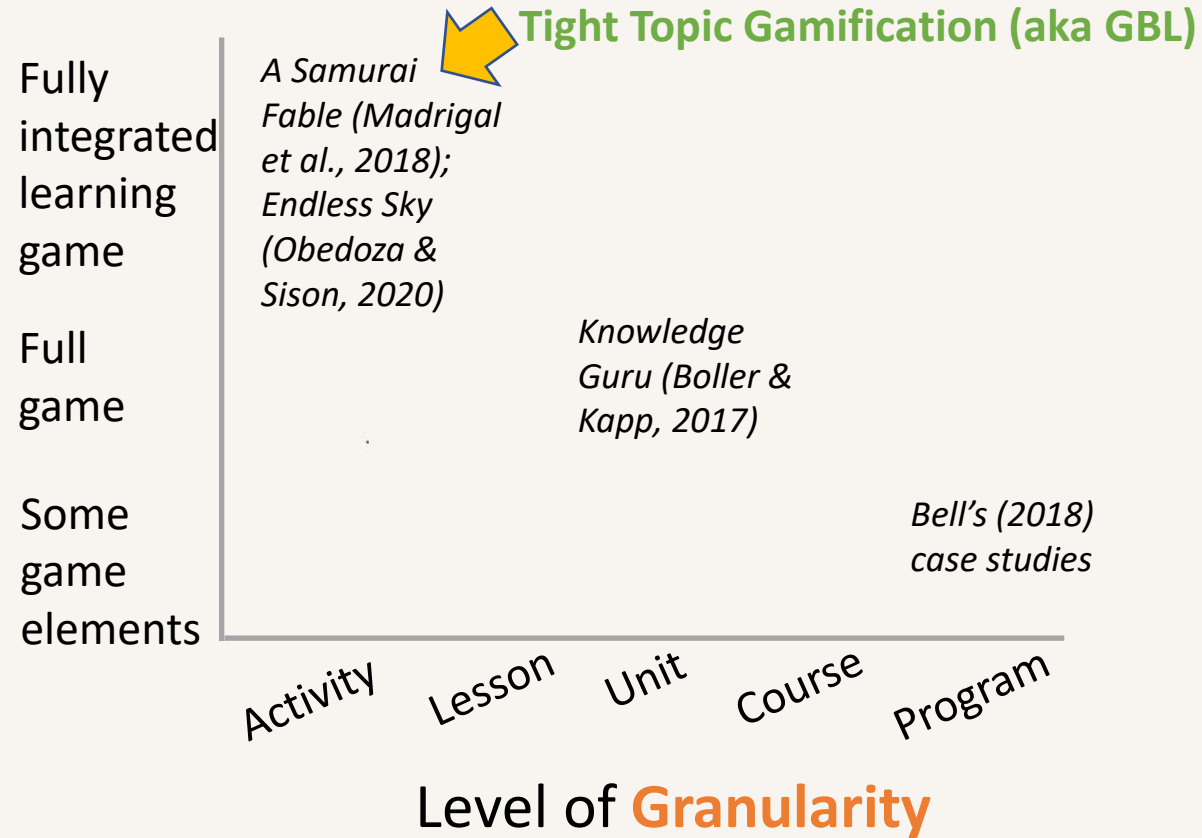
Tight Topic Gamification

a.k.a. **Game-Based Learning**

Recap

Dimensions of Gamification (Sison, 2021)

Degree of **Integration** of Learning and Game Elements



What is game-based learning (GBL)?

It is the use of

games

(with well-integrated formal and dramatic game elements)

to make learning

more **engaging**.

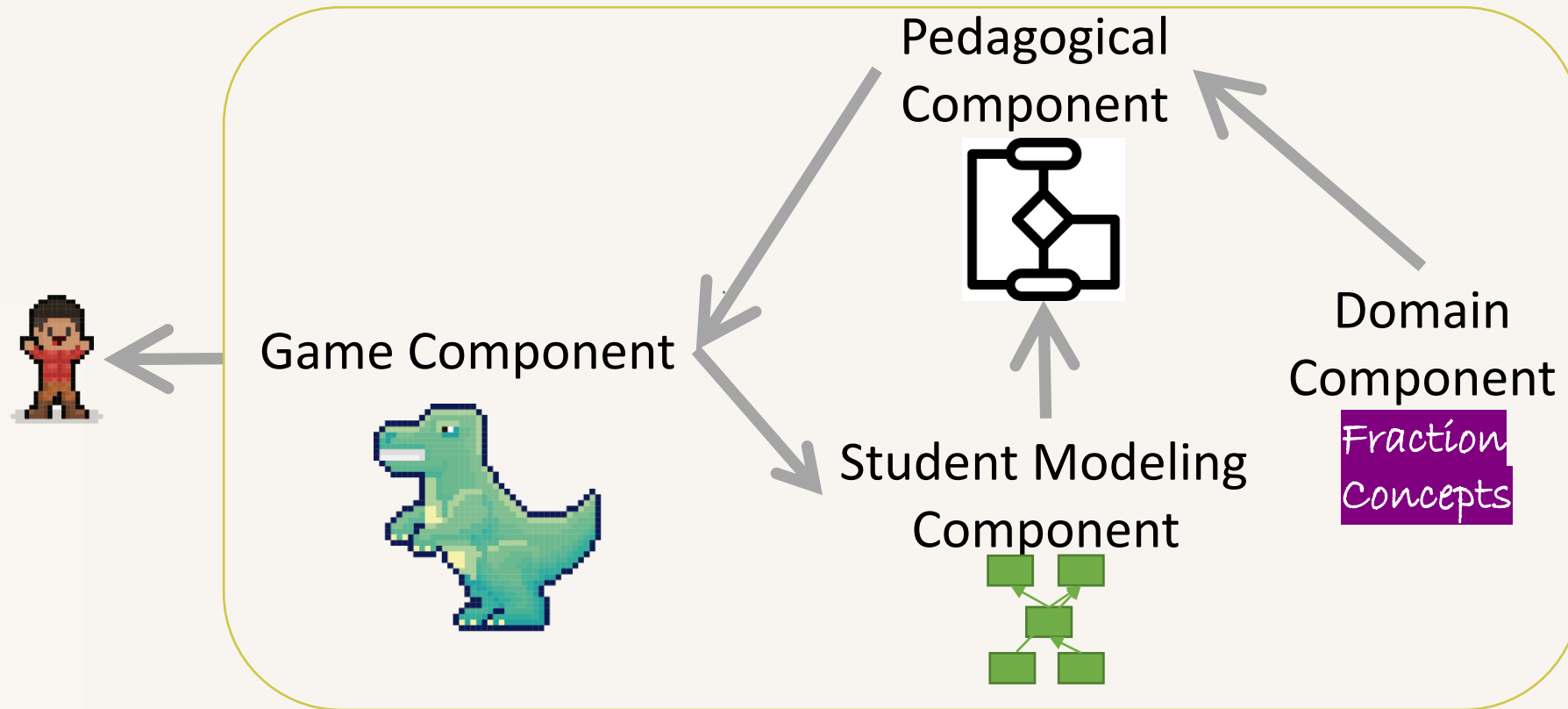
So, what is the relationship between gamification and GBL?

Tight Topic Gamification

- What to gamify
 - Which learning competency or outcome to gamify
 - Which activity (teaching-learning activity or assessment activity) to gamify
- When to gamify
 - Is the topic boring?
 - Is the topic difficult?
- How to gamify
 - Use a **GBLE development methodology**

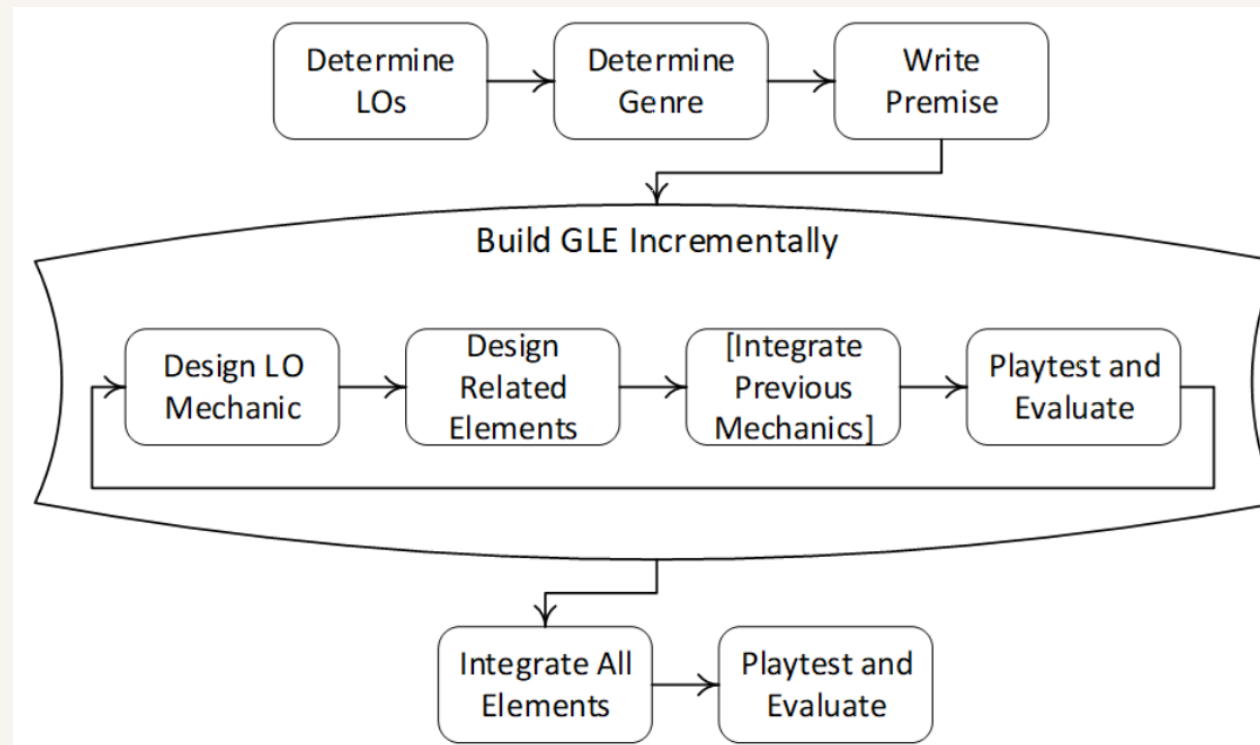
GBLE Components

A GBLE Environment (GBLE) is a system with several components:



GBLE Design Methodology

We advocate an outcome-based, agile design methodology.

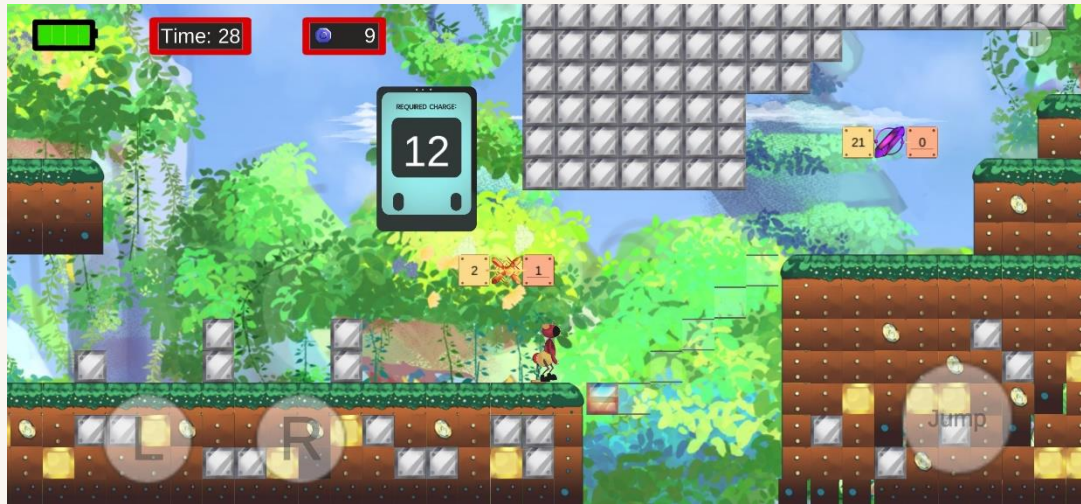


(Sison et al., 2018)

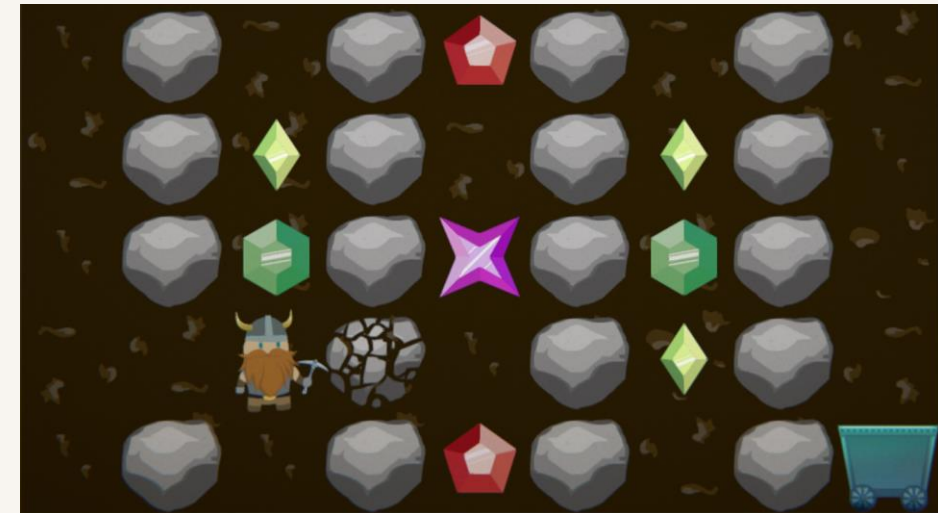
Sample GBLEs

From a joint SCE558M (GBL) and EDUGAME class last term:

Operation C.Y.B.E.R.



Grimli's Mining Operation



GBLE Evaluation

A GBLE promotes learning while being engaging.

Therefore, we must evaluate two aspects:

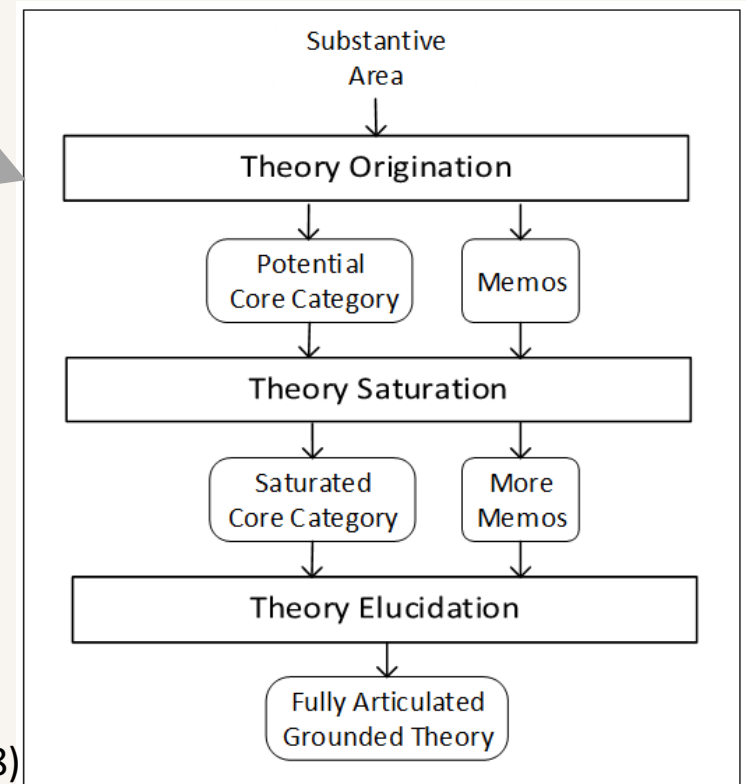
1. Are the player learning?
2. Are the players engaged?

Evaluating Learning

We can use a quantitative, qualitative, or mixed-method approach.

Group	Pretest	Treatment	Posttest
1 (Experimental)	01	GBLE	02
2 (Control)	01		02

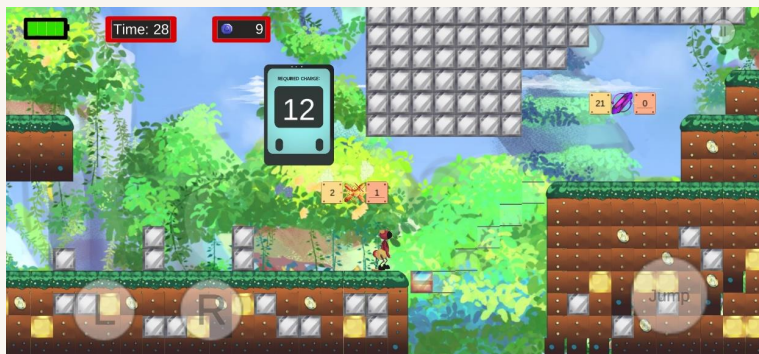
Source: Sison, R. (2020). Developing game-based learning environments using an outcome-based methodology. Approved URCO Project Proposal. DLSU.



(Sison and Lavilles, 2018)

Sample Results

From a joint SCE558M (GBL) and EDUGAME class last term:



Variable	Group	N	Mean	SD	Adjusted Mean	Std. Error	F
Post-test	Experimental	21	19.39	2.38	19.39	.43	20.01***
	Control	24	15.64	3.39	15.64	.43	

***p<.001

Achievement Test	Mean	%	SD
Pre-Test	8.15	40.75	4.67
Post-Test	11.68	58.40	4.67

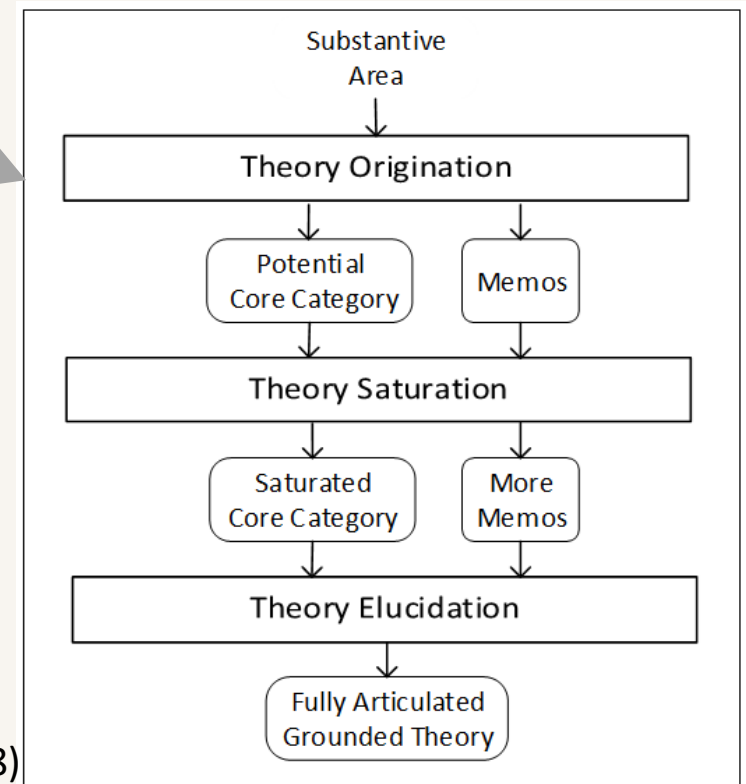
Achievement Test	Mean	SD	SEM	Confidence Interval		t	df	p-value
				Lower	Upper			
Pretest-Posttest	-3.53	3.15	0.49	-4.53	-2.52	-7.07	39	0.000



Evaluating Engagement

We can use a quantitative, qualitative, or mixed-method approach.

- *GameFlow*
- *Player Experience Inventory*
- *Player Experience of Needs Satisfaction*
- *Game Engagement Questionnaire*
- *Game Immersion Questionnaire*
- *Game Experience Questionnaire*



(Sison and Lavelles, 2018)



Coarse-Grained Gamification

Can we gamify entire programs?

Can we gamify life?

Recap

Dimensions of Gamification (Sison, 2021)

Degree of **Integration** of Learning and Game Elements

Fully integrated learning game
Full game
Some game elements

*A Samurai Fable (Madrigal et al., 2018);
Endless Sky (Obedoza & Sison, 2020)*

Knowledge Guru (Boller & Kapp, 2017)



Coarse-Grained Gamification

Bell's (2018) case studies

Activity Lesson Unit Course Program

Level of **Granularity**

Coarse-Grained Gamification

- What to gamify
 - Which course or program to gamify
 - Which activity (teaching-learning activity or assessment activity) to gamify
- When to gamify
 - Is the topic boring?
 - Is the topic difficult?
- How to gamify
 - What is the objective?
 - What are the procedures?
 - What are the rules?

Knowledge Guru (Boller & Kapp, 2017)

The image displays four screenshots of the Knowledge Guru interface:

- Top Left:** A world map titled "World A" with a sidebar showing levels A, B, C, and D. A circular path of icons is overlaid on the map.
- Top Right:** A question screen titled "Question 1 of 6" with a score of 0. The question is "What is a game goal?" with four possible answers: "Features that immerse a player in the game.", "A description of the game play experience.", "Rules players follow in a game.", and "What players do to win."
- Bottom Left:** A question screen titled "Question 4 of 6" with a score of 1500. The question is "The game goal of Monopoly is to send all other players into bankruptcy. What two core dynamics do players use to do achieve the goal?" with four possible answers: "Matching", "Collection", "Alignment", and "Territory Acquisition". A Monopoly board is shown below the question.
- Bottom Right:** A "Standings" screen with a score of 4500. It shows a player's profile (BSeeboo, Rank: 900, Score: 4500) and a "Play2Learn Book Top Scores" table.

Rank	Player	Score
1	jayshih	674500
2	Riles	654000
3	STechnologies	654000
4	DBickell	634750
5	AbigailSS14	608000
6	DCrawford	543750

<https://www.theknowledgeguru.com/ATDGameDesignGuru/game.cfm>

Knowledge Guru's Rules (Boller & Kapp, 2017)

World A Actions	Points Gained and Lost
Respond correctly on first attempt at question	1,000
Respond incorrectly on first attempt at question	-250
Retry responding after reviewing misstep	1,000
Miss second attempt at question	-500
Respond correctly on third attempt at question	1,000
Miss any future attempts	-500
Answer correctly on fourth attempt or more	0
World B Actions	Points Gained and Lost
Respond correctly on first attempt at question	5,000
Respond incorrectly on first attempt at question	-2,500
Retry responding after reviewing misstep	2,500
Miss second attempt at question	-5,000
Respond correctly on third attempt at question	0

Miss any future attempts	-5,000
Answer correctly on fourth attempt or more	0
World C Actions	Points Gained and Lost
Respond correctly on first attempt at question	10,000
Respond incorrectly on first attempt at question	-10,000
Retry responding after reviewing misstep	5,000
Miss second attempt at question	-20,000
Respond correctly on third attempt at question	0
Miss any future attempts	-20,000
Answer correctly on fourth attempt or more	0

Table 7-4. Power-Up and Reward Scoring for Knowledge Guru Game

(Boller and Kapp, 2017)

Gamifying Post-Traumatic and Post-Ecstatic Growth (McGonigal, 2015)

Decide what real-life obstacle you want to tackle or what positive change you want to make

Anything that blocks your progress or causes you anxiety, pain, or distress

Friends and family members who will help you along the way

1. Challenge yourself.
2. Collect and activate power-ups.
3. Find and battle the bad guys.
4. Seek out and complete quests.
5. Recruit your allies.
6. Adopt a secret identity.
7. Go for an epic win.

Good things that reliably make you feel happier, healthier or stronger

Simple daily actions that help you reach your bigger goals

A heroic nickname that highlight your unique personal strengths

Awe-inspiring outcomes that helps you be more motivated or less afraid of failure

Quiz

Leaderboard



Join at
slido.com
#766 711

Congratulations, Pauline!

#1	Pauline	4/4	0:28
#2	Rye	4/4	0:30
#3	Anna Marlaine Litonjua	4/4	0:35
#4	Moigon	3/4	0:28
#5	regie	3/4	0:36

Hardest question 59%

Which of these must we evaluate a GBLE in terms of?



References

We stand on the shoulder of giants.

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