Gamification & Learning in Higher Ed

4 February 2025

The Premise…

Congratulations,
You Logged-In!

Using the MakerLab

Gamifying Classroom Components

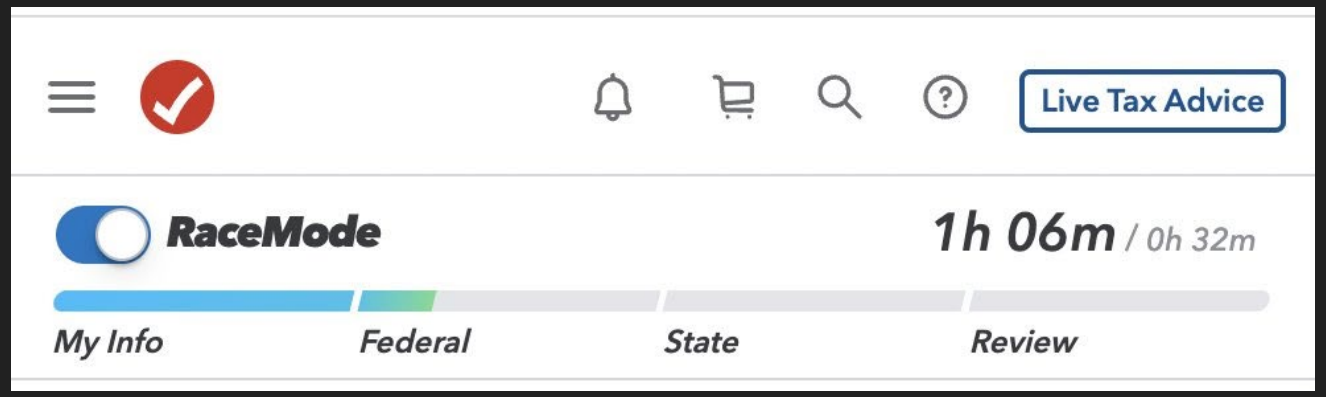
What is gamification?

Designing & Implementing a Gamified Class

Your Gamified Class

The definition, err definitions?

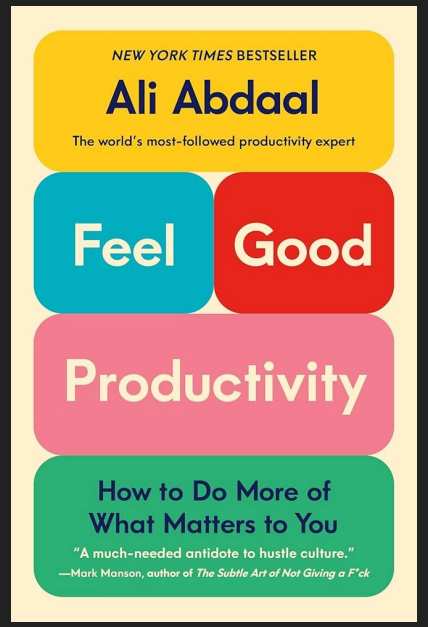
- The process of game-thinking and game mechanics to engage used and solve problems (Zichermann and Cunningham 2011)
- The use of game design elements in non-game contexts (Deterding, et al. 2011)
- Using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning, and solve problems (Kapp 2012)

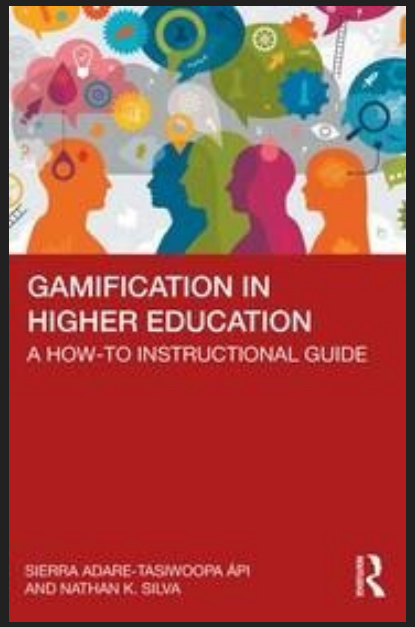


Slido.com → 2002042

To what extent do you currently deploy gamification in courses as part of your teaching?

Using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning, and solve problems (Kapp 2012)





Let's play a game!

Kahoot.it Pin# 688205

Answer these questions based on what you know or assume about gamification.

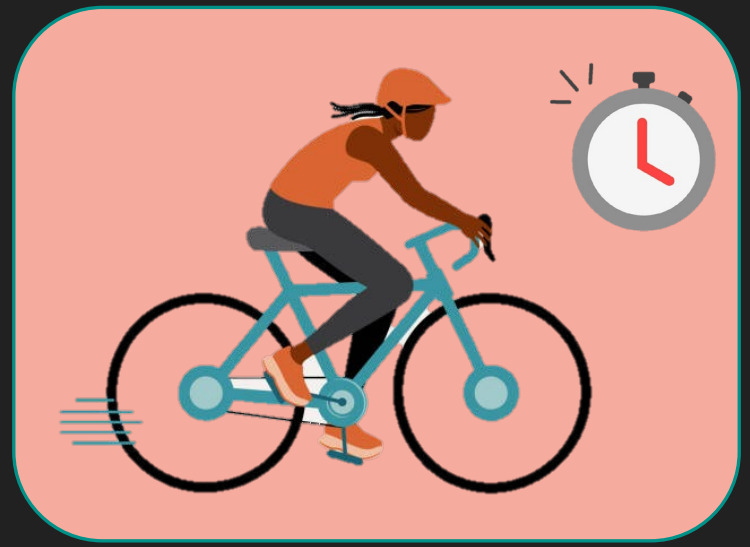
Achievement Unlocked:
Gamification Pre-Test

Association between real-world experiential diversity and positive affect relates to hippocampal–striatal functional connectivity

Aaron S. Heller, Tracey C. Shi, C. E. Chiemeka Ezie, Travis R. Reneau, Lara M. Baez, Conor J. Gibbons & Catherine A. Hartley

Nature Neuroscience **23**, 800–804 (2020) | Cite this article

Making every day tasks an adventure increases satisfaction



Intrinsic Motivation: Challenge, Curiosity, Control, Context

Reframing Classes as a Place for *Learning* Rather than Grades

Trying is often penalized with a loss of points, how can we change the narrative and mitigate the risks of failing in the classroom?

What are the most important outcomes from your class?

Extrinsic Motivation: Praise, Punishment, Public Recognition, Prizes

What if we were better at encouraging trying?

- You learn through failing!
- For play to work: low stakes (lots of opportunities to fail!) and encourages relation (to others, to content, to format)
- Reinforces growth mindset, "practice makes better"
- "If we weren't so concerned with failure, how much more could we learn?"

Improving student performance through loss aversion.

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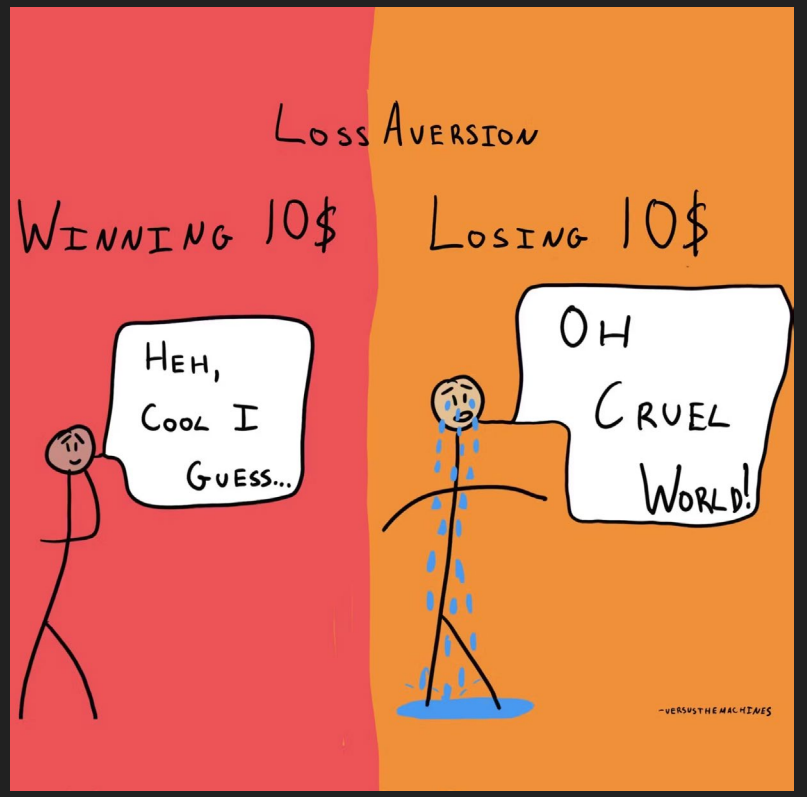
Smith, B. O., Shrader, R., White, D. R., Wooten, J., Dogbey, J., Nath, S., O'Hara, M., Xu, N., & Rosenman, R. (2019). Improving student performance through loss aversion. *Scholarship of Teaching and Learning in Psychology, 5*(4), 278–288. https://doi.org/10.1037/stl0000149



Effects of Gamifying Course Content

Don't take my word for it, let's look in the literature!

TABLE I
RESULTS OF THE PRETEST AND THE POST-TEST

GROUP	PRE-TEST		POST-TEST		LEARNING GAINS		WILCOXON SIGNED-RANKS TEST FOR PAIRED SAMPLES	
	M	SD	M	SD	M	SD	p-value	Effect size (r)
Control (N=81)	3.3	2.1	5.4	2.3	2.1	2.6	< 0.001	0.45
Experimental (N=99)	3.4	1.6	6.3	2.0	2.9	2.4	< 0.001	0.54

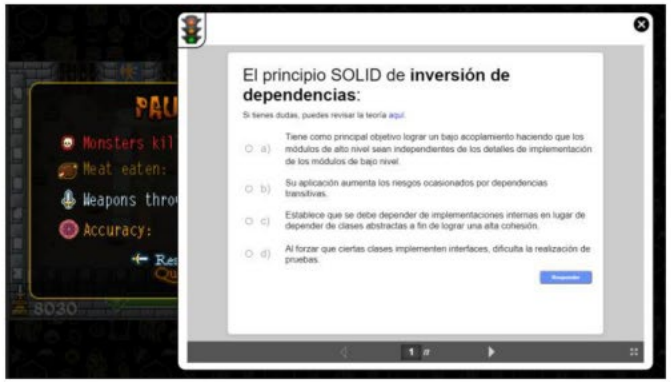


Fig. 2. Multiple choice question integrated into the educational video game.

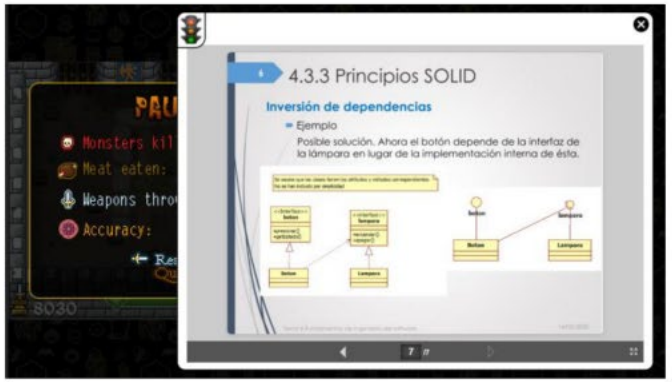


Fig. 3. Slide with theoretical content integrated into the educational video game.

Not only did gamifying increase test performance, students liked it!

TABLE II
ITEMS OF THE QUESTIONNAIRE

Item	
1	My overall opinion on the learning methodology used is positive.
2	The learning methodology helped me learn.
3	The learning methodology was appealing and motivating.
4	The learning methodology made learning fun.
5	I needed help to complete the activities.
6	All the resources were suitably integrated into the platform from which I access them.
7	I would like to learn using the same methodology in the future.
Items only included for the control group	
8a	My overall opinion on the videos is positive.
9a	I prefer to learn using videos than playing educational video games.
Items only included for the experimental group	
8b	My overall opinion on the educational video game is positive.
9b	I prefer to learn playing educational video games than using videos.

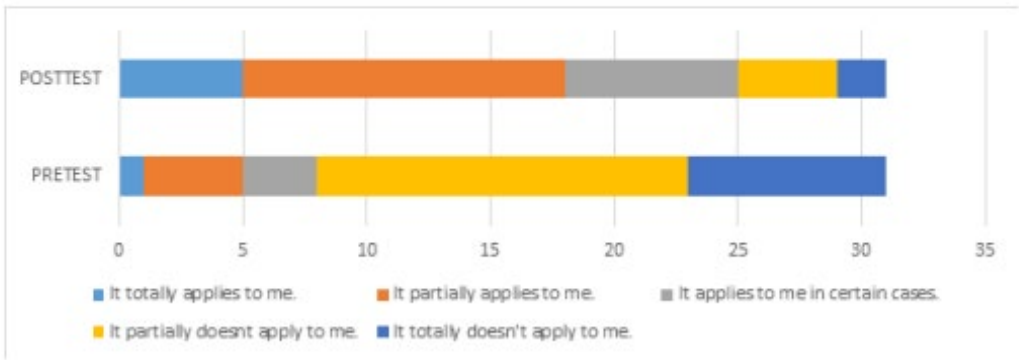
TABLE III
RESULTS OF THE QUESTIONNAIRE

Item	Control group		Experimental group		Mann-Whitney U Test	
	M	SD	M	SD	p-value	Effect size (r)
1	4.0	1.0	4.5	0.8	0.003	0.20
2	4.0	1.0	4.1	1.1	0.265	0.05
3	3.6	1.1	4.2	1.0	< 0.001	0.27
4	3.2	1.1	4.2	1.0	< 0.001	0.43
5	2.0	1.4	2.1	1.5	0.790	0.06
6	4.5	0.8	4.3	1.0	0.471	- 0.01
7	4.0	1.0	4.4	0.9	0.006	0.19
8 (a/b)	4.1	1.0	4.3	1.0	0.128	0.08
9 (a/b)	3.6	1.1	4.2	1.0	< 0.001	0.26

WITH GAMIFICATION TO COLLABORATIVE LEARNING IN CHEMISTRY LESSONS

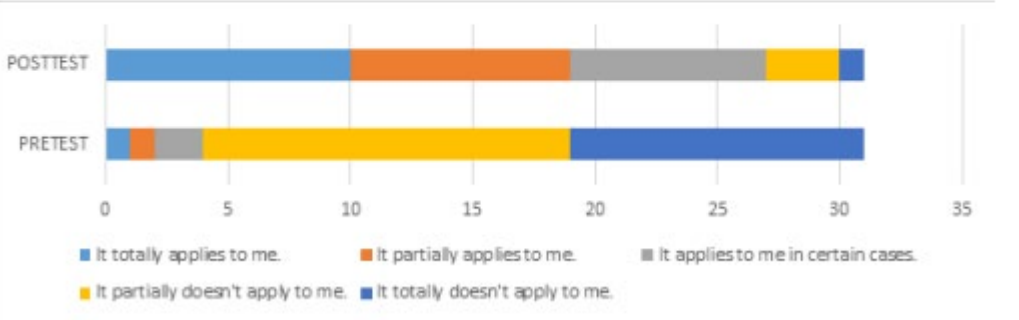
Elena Rudolf
Secondary School of Economics Maribor, Slovenia

Figure 13
The Influence of Cooperative Learning on the Understanding of Learning Content (Comparison of Pre-test and Post-test)



Gamification increased students' appreciation of the benefit of cooperative learning on content knowledge

Figure 14
The Influence of Collaborative Learning on Learning Motivation (Comparison of Pre-test and Post-test)



Collaborative learning, by way of gamification, increased students' motivation for learning

Gamification in education: a mixed-methods study of gender on computer science students' academic performance and identity development

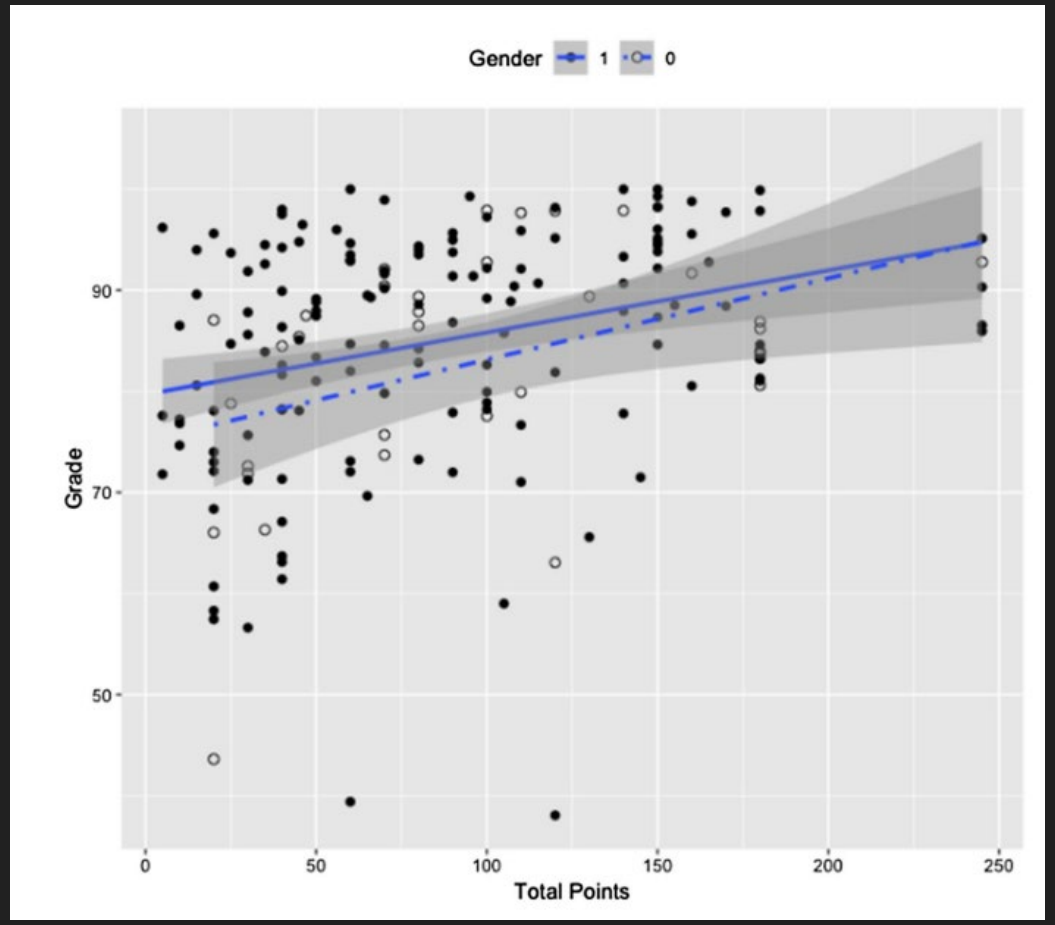
Leila Zahedi[1] · Jasmine Batten[1] · Monique Ross[1] · Geoff Potvin[2] · Stephanie Damas[3] · Peter Clarke[1] · Debra Davis[1]

Team-based gamification closed gender –based achievement gap!

In the beginning, I had a hard time, like I was kind of struggling with it, but I don't know, it's just you have to learn a whole new thing. But now that I've kind of got into it, I like the challenge. It's definitely a challenge, but it's something I'm willing to put effort into… Because even if I'm not like a hundred percent confident, I feel like I'm getting there. Like I can easily work my way towards that.—Sarah.

What I did like about SEP-CyLE, though, is the point system. So, groups would basically go against each other, and that does motivate a lot of students… It's like how people are addicted to games, because of reward systems… We would always be on top of it and be like "Yo, do your SEP-CyLE assignment so we can get more points, so we can get extra credit."—Jinx.

like, oh I'm going to get points! I like that… [I felt] proud… Like I really, really love it… Competitiveness can be fun. So, it's kind of like a fun way of learning.—Nicole.

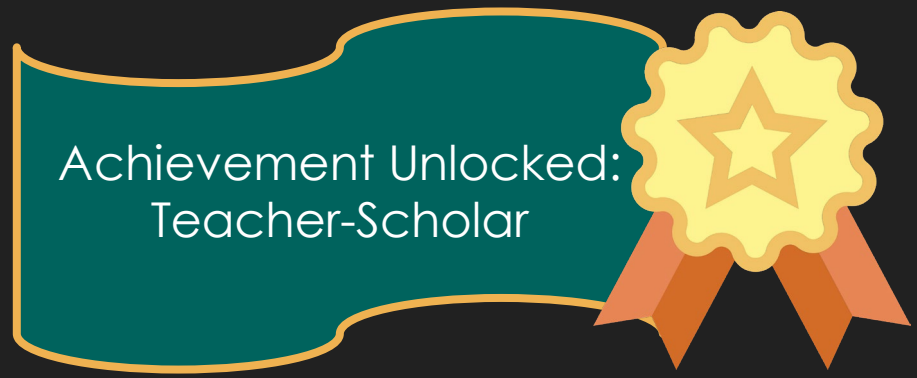


The Impact of In-Classroom Non-Digital Game-Based Learning Activities on Students Transitioning to Higher Education

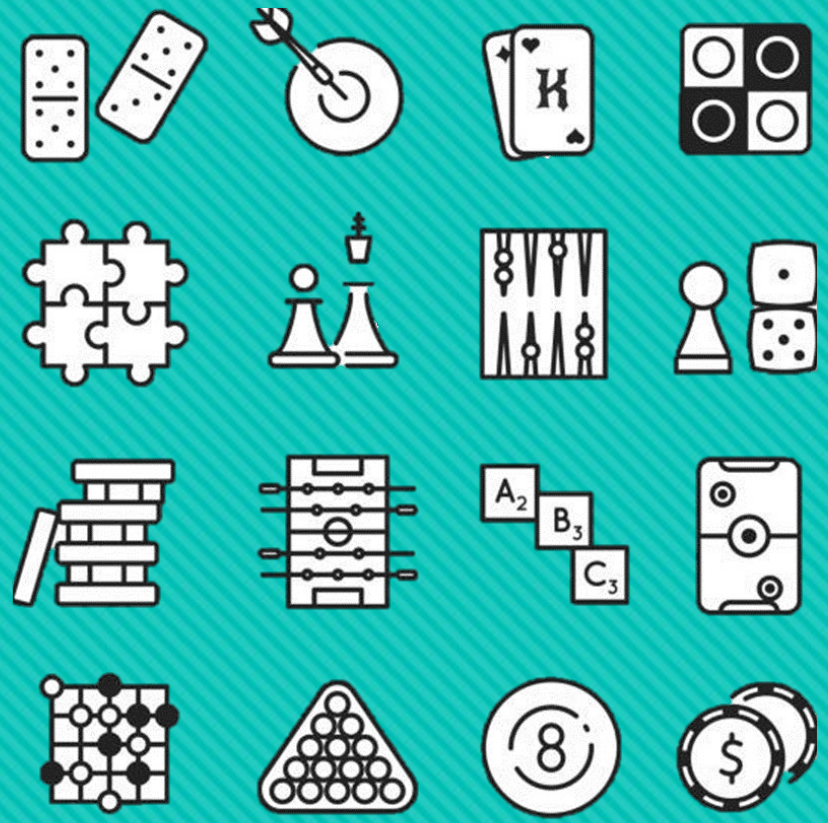
by Chitra Balakrishna

Gamification increased student attendance and engagement

Collaborative learning, by way of gamification, increased students' motivation for learning



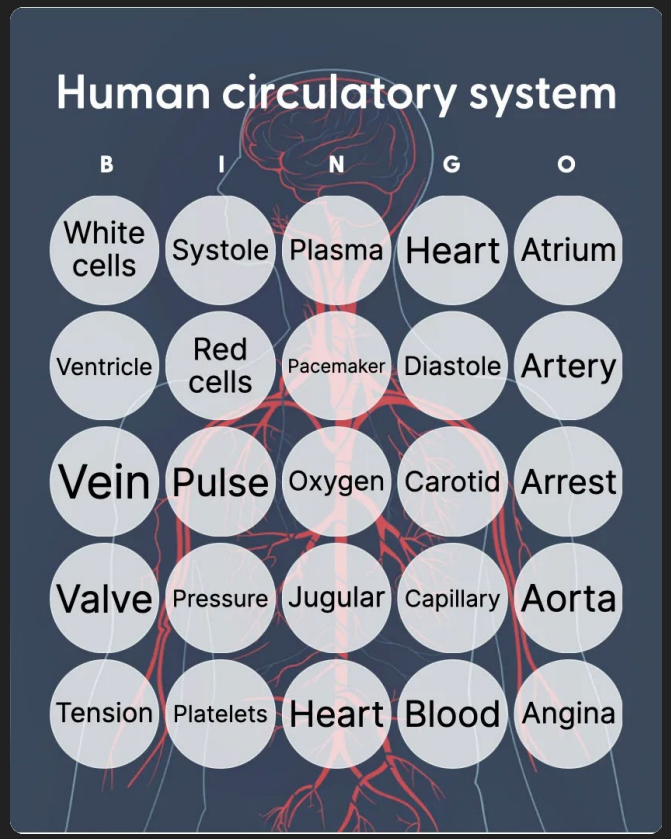
Data	Experimental Group	Control Group
Avg weekly attendance for the module (%)	87%	74%
Avg weekly attendance for three other modules	Module 1 (74%)/Module 2 (70%)/Module 3 (72%)	Module 1 (74%)/Module 2 (70%)/Module 3 (72%)
EoM Q3: How actively did you participate in the classroom activities	4.71 (very actively)	3.2 (somewhat actively)
Average assignment score mean (Std dev)	74 (11.41)	67 (11.02)
Average group component score mean (Std dev)	86 (8.12)	71 (9.80)
Average score across three other modules (Std dev)	65 (10.63)	69 (10.42)



Types of Games

Classic Standbys

BINGO

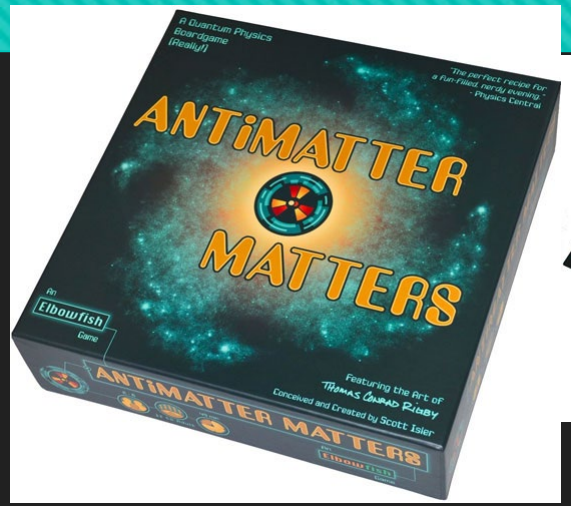


Quiz Bowl

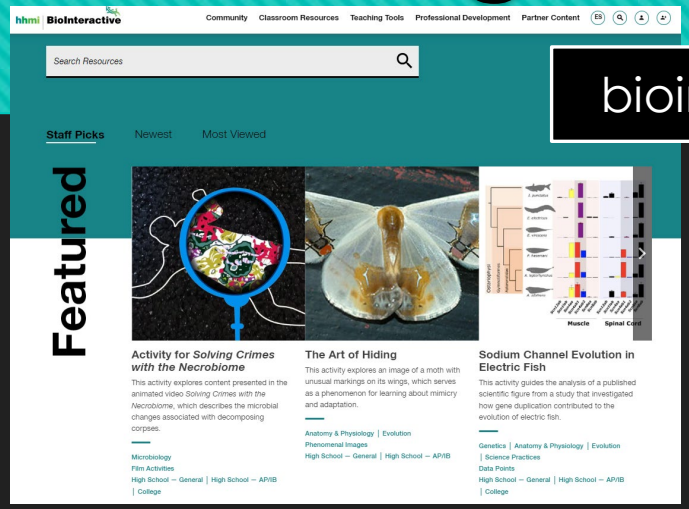
Periodic Table	Atoms	Elements, Compounds, and Mixtures	Chemical Bonding	Ions and Isotopes
$1	$1	$1	$1	$1
$2	$2	$2	$2	$2
$5	$5	$5	$5	$5
$10	$10	$10	$10	$10
$20	$20	$20	$20	$20

Jeopardy

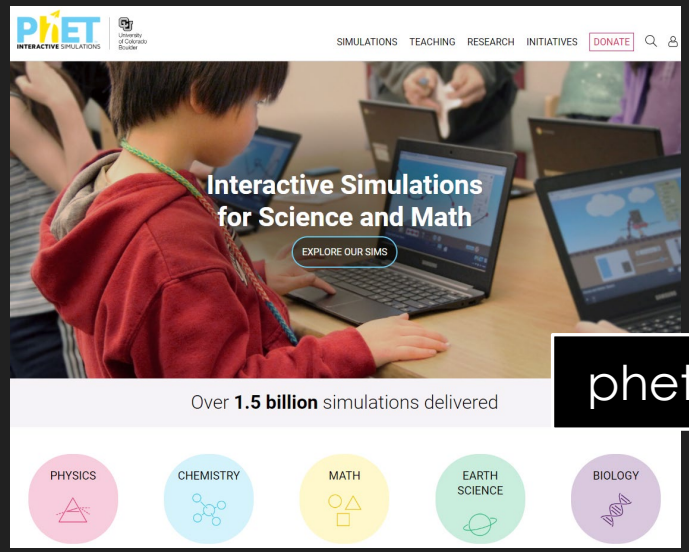
Readymade Games & Apps



Building from Resources & Databases

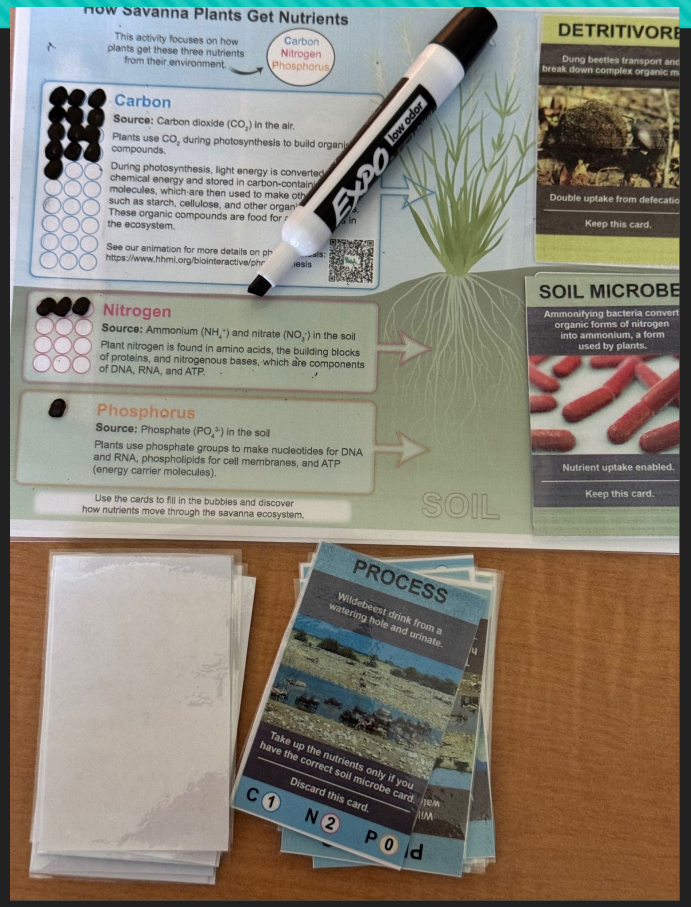


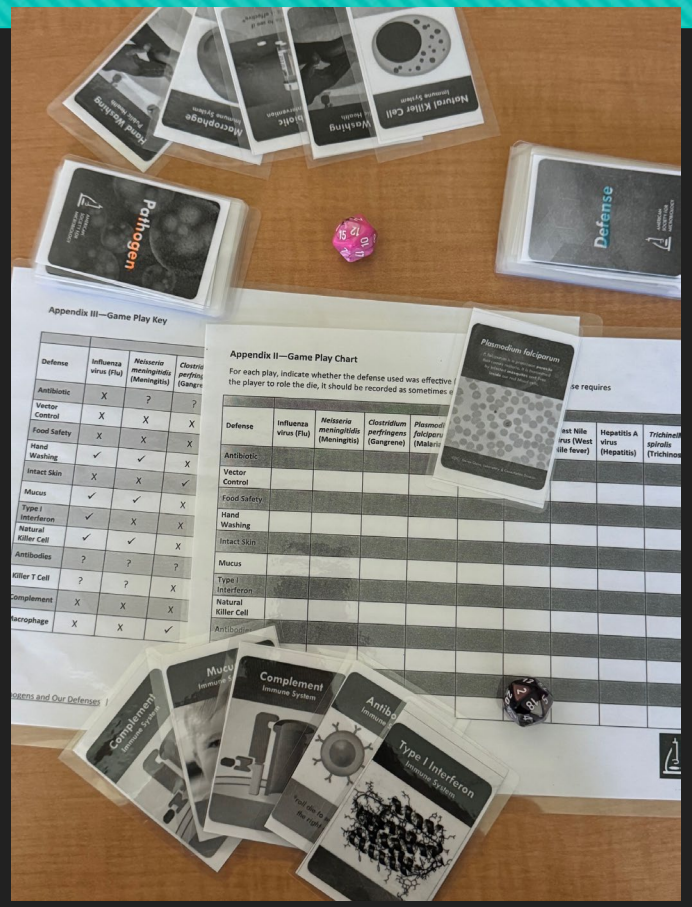
biointeractive.org



phet.colorado.edu

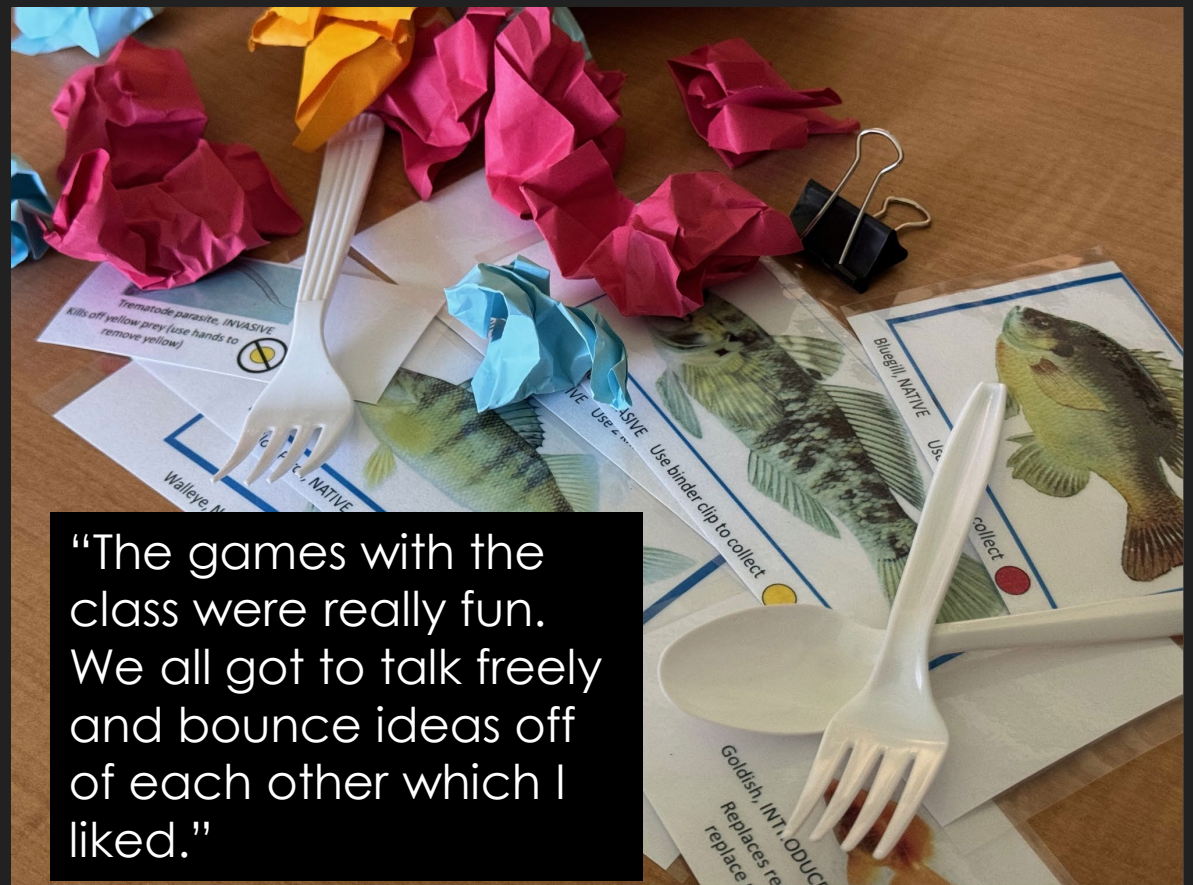
There are tons of activities, simulations, and worksheets you can gamify available in public databases and repositories





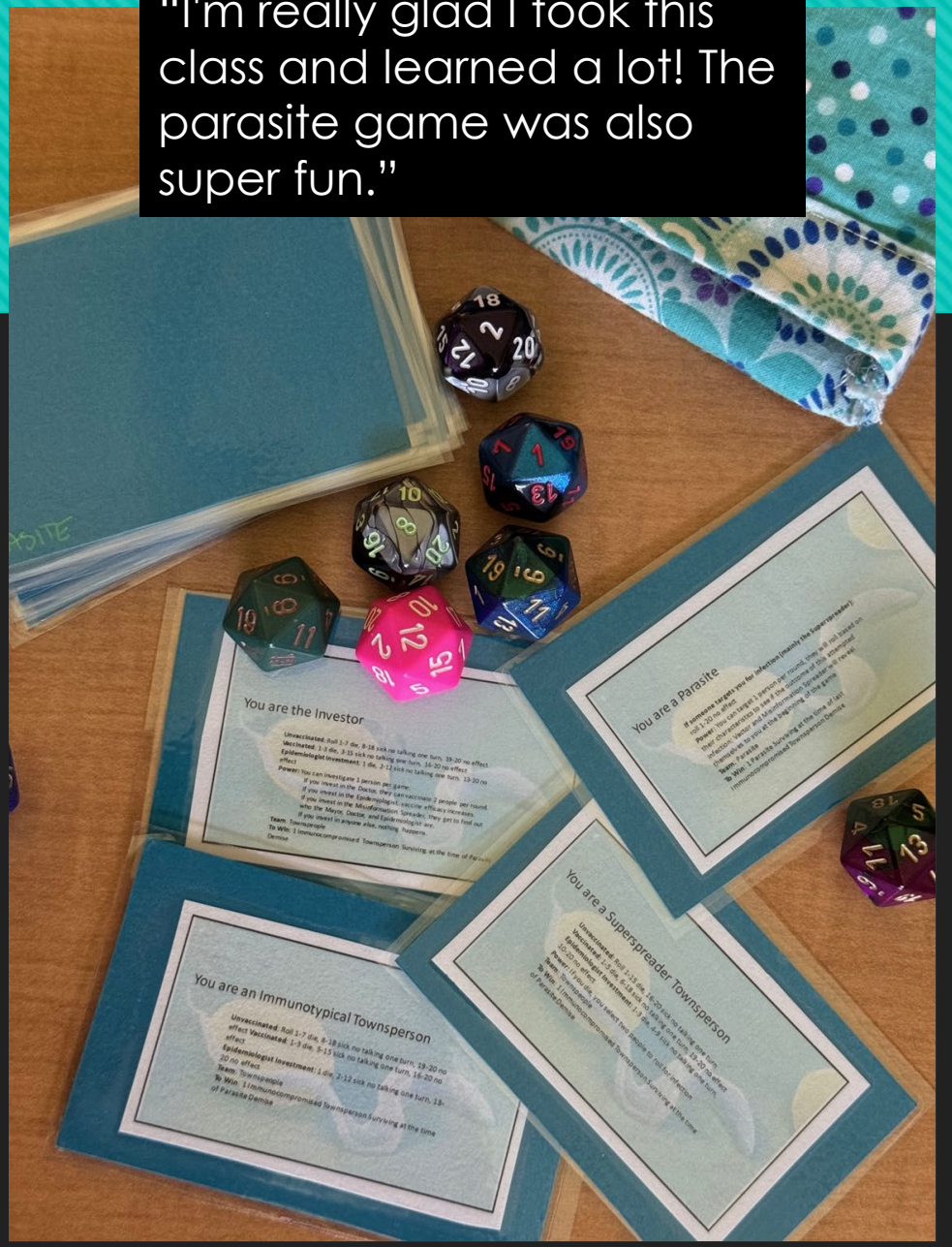
Make your own!

Species Competition Game ↓



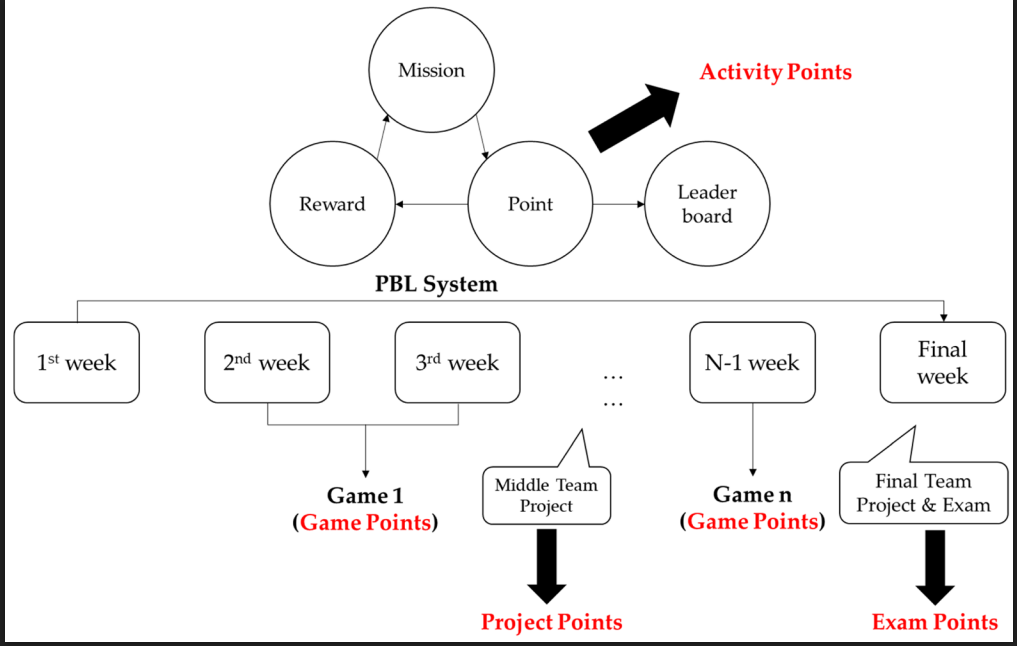
"The games with the class were really fun. We all got to talk freely and bounce ideas off of each other which I liked."

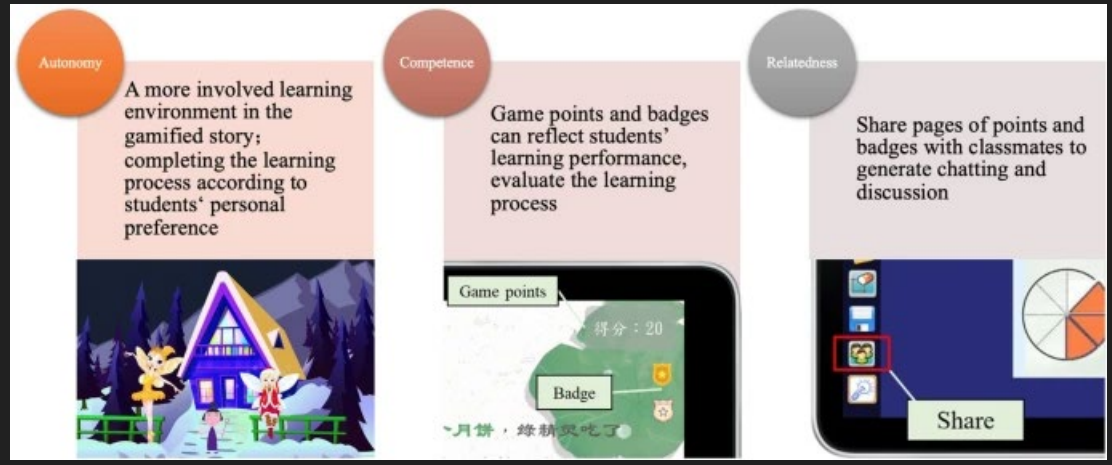
Parasite →



"I'm really glad I took this class and learned a lot! The parasite game was also super fun."

Gamify your class from top to bottom!





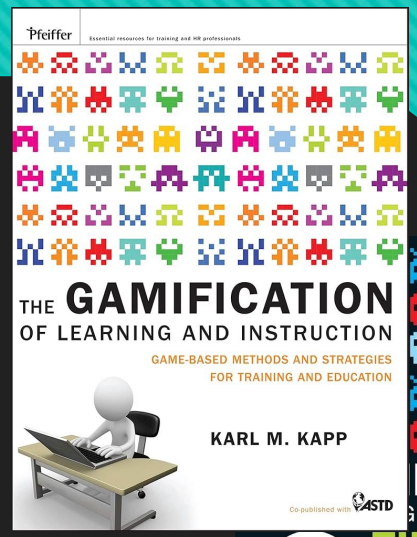
Learning Performance Styles in Gamified College Classes Using Data Clustering

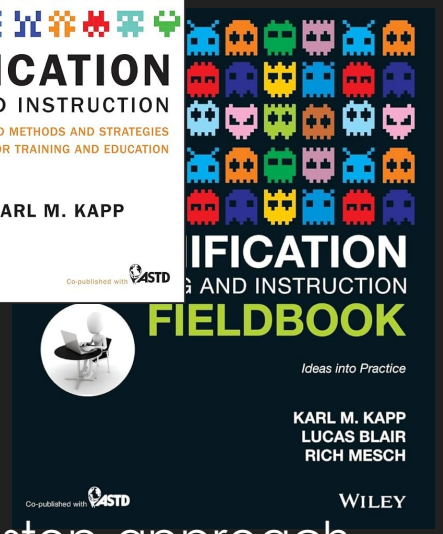
by Sungjin Park and Sangkyun Kim *

Effects of gamified interactive e-books on students' flipped learning performance, motivation, and meta-cognition tendency in a mathematics course

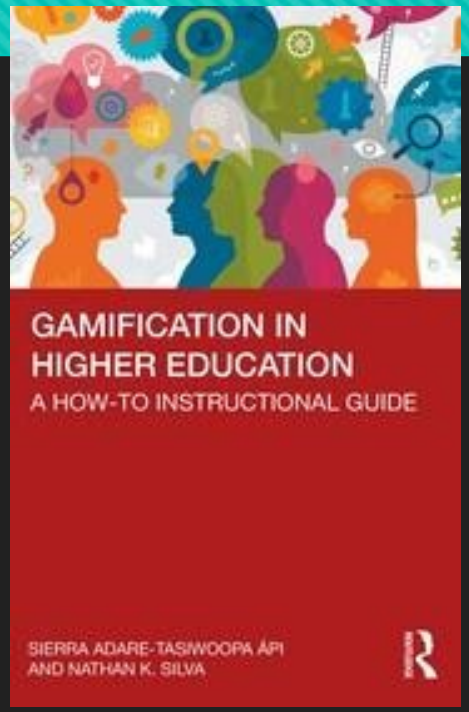
Jiahua Zhao[1] · Gwo-Jen Hwang[2] · Shao-Chen Chang[3] · Qi-fan Yang[4] · Artorn Nokkaew[5]

Want to Learn More?

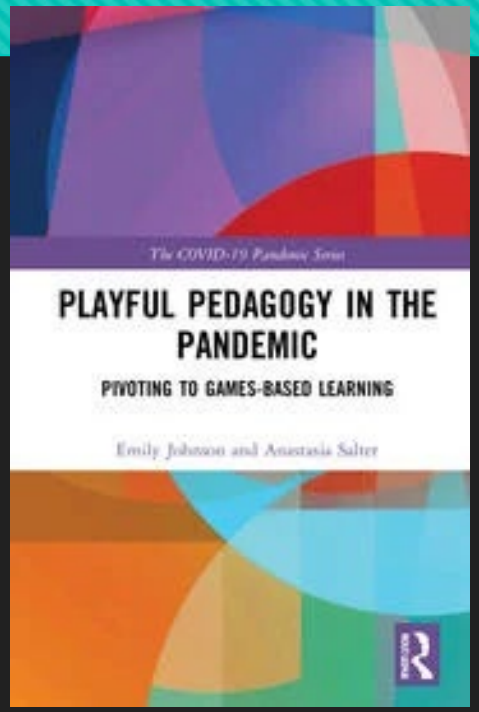




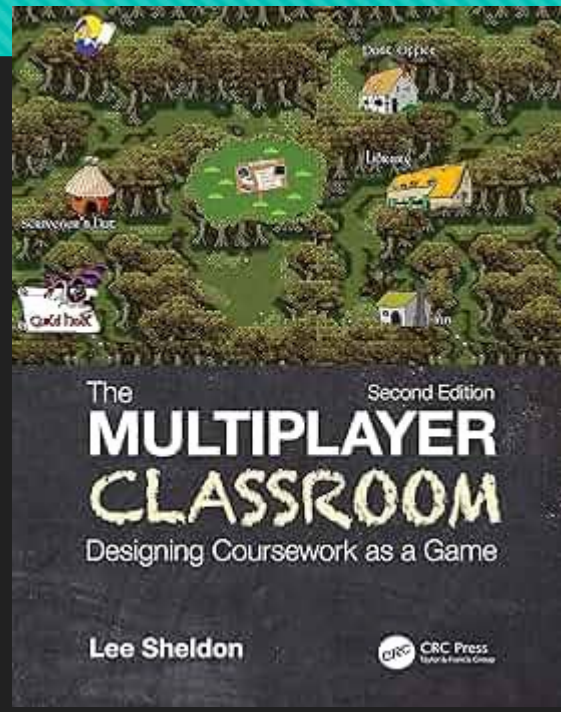
Step-by-step approach to applying the concepts of gamification, learn & apply



This text provides a lot of idea at varied levels of activation energy



An account of how to use gamification in the online learning with applications for on-ground, hybrid, and eLearning settings



This guide provides a roadmap to a complete gamification of your course – detail & plans!

Congratulations! You have completed Level 1: What is gamification?

Questions? Submit them here!

Join us next Tuesday at 3pm in the MakerLab!