

# Game Based Learning: Good Learning via Gaming

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figure 1

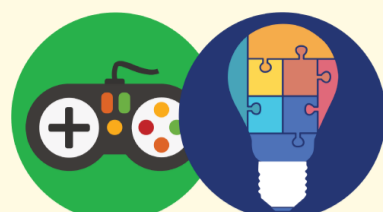


figure 2

## James Paul Gee

In his work, [Jim Gee Principles on Gaming \(2013\)](#), James Paul Gee effectively organizes his 13 learning principles into 3 broader categories--Empowered Learners, Problem based Learning, and Deep Understanding. Gee effectively shares his principles and ensures they are accessible to all educators by identifying a variety of practical classroom applications. In reflecting on my own experiences as a classroom teacher, I have chosen three principles from those below, to explore and apply more deeply within the context of learning through games.

### Principles of Empowered Learners

Agent or Co-design  
**Customization**  
identity  
Manipulation

### Principles of Problem-based Learning

Well-ordered problems  
Pleasantly frustrating  
The Cycle of Expertise  
Just in time or On-demand Information  
Fish Tank  
**Sandboxes**  
Skills as strategies

### Principles of Deep Understanding

Systems Thinking  
Situating Meaning Principle



figure 3

Customization allows learners to determine how they will reach their learning goal.

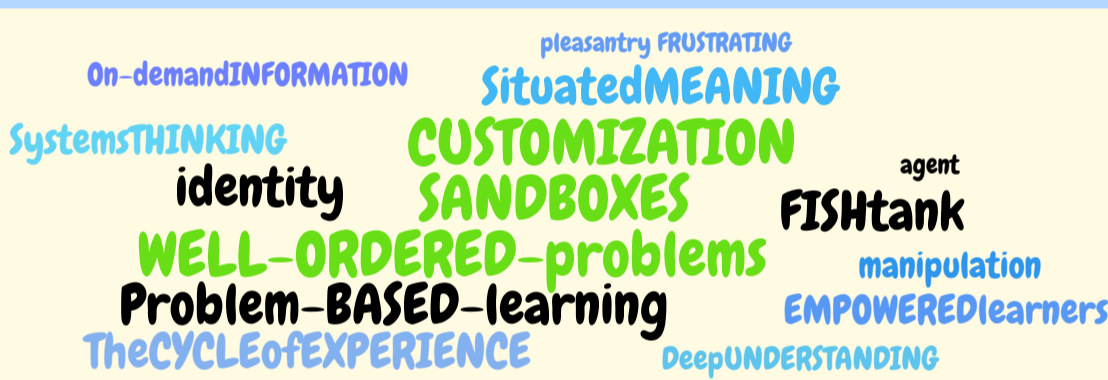
In today's classroom and more than ever before in the history of education, differentiation and personalized learning opportunities are synonymous with effective day-to-day instruction. Effective, connected teachers take time to get to know what their students need to be successful, as well as how they can most effectively support a variety of learning styles and interests. This isn't easy; it takes a valiant effort of effective planning and curriculum-aligned assessment practices, but our students reap the rewards. Our learners come to our classrooms with backpacks of life—full of experiences, interests, talents, skills, and challenges. Gee's **Customization Principle** suggests that learners are empowered when they can fit the gamified environment to their needs; students choose their own path to success, as their agency increases. Gee suggests, "Good games customize to different types of players and also invite [learners] to try new styles and strategies" (2013). Customization allows learners to determine how they will reach their learning goal; often ruling out if they'll reach their goal. As much as I could, my students experienced customization throughout their learning each day. I found that even reluctant learners were excited to complete tasks and assignments when they could create their path for learning. When we allow students to be part of the learning plan, we shift more than just the responsibility of a task; we give them pride of ownership.

In experiences where students are given opportunities to scaffold learning, building upon one new skill or challenge at a time, we know that learning deepens and solidifies. As part of Gee's Problem-Solving category, **Well-ordered Problems** are most effective in preparing students to tackle more difficult tasks. When teachers sequence learning, guiding students to acquire and apply skills in an effective sequence, they create opportunities where students experience repeated success. Gee suggests that teachers "need to sequence problems" and that this sequencing "correlates to level-design" (2013). Like traditional learning that is scaffolded to ensure skills are solidified before a student moves on, each level in an effective game allows students to solve a problem and be ready for the next level. "This is a very important principle for how the human mind works; for how human learning works and we need to bring level-design to schooling" (Gee, 2013). I find McTigh's and Wiggins's backward design approach to planning to be most effective for creating well-ordered problems. By beginning with the 'end in mind,' I can identify the overall learning objective and breakdown each step into a 'bite-sized' problem or challenge for my learners. When problems are not effectively broken down and laid out, like they are in good games, what should be pleasantly frustrating and successful for many learners becomes overwhelming and ineffective for most.

Well-ordered problems are most effective in preparing students to tackle more difficult tasks.

The Sandbox Principle, applied to learning, gives students a safe place to explore.

Also part of Gee's Problem-based Learning category is the **Sandbox Principle**—in gaming, this is a place where students can explore without fear of failure or judgment. A safe learning environment is a place where students can take risks, make mistakes, receive and give feedback, and experience success toward their learning goals. Essentially, this principle is—or at least should be—visible every day and in classroom. Students need a safe place to test their thinking, without the fear of failure, when learning a new skill or applying a new strategy. We don't get better at anything if we don't have time to practice, think and reflect, and practice some more. The Sandbox principle is synonymous to formative assessment (Assessment for Learning), where students don't yet have all the answers—nor do they need to. Gaming experiences in and out of the classroom give students critical, timely feedback—as do teachers when they formatively assess a student's evidence of learning in other ways; from these messages, students are able to assess what they know, and make decisions about their next steps to get closer to their goal. New learning would not be nearly as effective or sustained without the sandbox environment, which moves learners and learning forward.



## Gamification



figure 4

Adding gaming elements - like avatars, points, leader boards, and badges to non-game situations is known as gamification; these elements leverage game-type experiences to augment learning. This twist on traditional textbook learning often inspires excitement, engagement, and motivation from students at all levels. "Gamification systems like ClassCraft add an adventure game layer on top of the existing course infrastructure. Students create a character, play as part of a team, and earn experience points and rewards based on class-related behaviors" (Issacs, 2015). Several elements need to be considered when gamifying learning experiences for students. Some of these include: immediate feedback, scaffolded learning with challenges that increase mastery, progress indicators (badges, points, etc.), social connection, and player control. (Davis, 2014). What's important to remember is that the goal of the learning must remain the focus, not the gaming elements themselves, so thoughtful planning by the teacher, keeping learning goals in focus, is essential.

### Ideas for adding gamified elements to an elementary classroom:

- team points for cooperative work toward completion of a task
- badges to 'level-up' when a new strategy is learned and applied in math
- XP points as students choose and complete online or paper modules and assignments



<http://bit.ly/Gamify>



figure 5

Games in the classroom offer students an alternate way to engage in learning--individually and with others. Games may be digital or real life (RL); powerful games offer multiple levels or challenges, a compelling or intriguing storyline, the ability to personalize the game, and a unique experience for each learner (Gamification in education, 2017). Unlike gamification, game-based learning should be closely aligned with curricular outcomes.

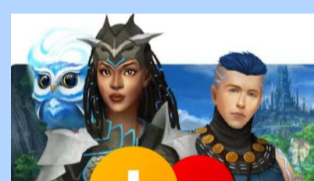


figure 6

Students might explore a simulation of a real-life experience in game format where feedback, reflection, and multiple attempts are done safely in a sandbox-type format. Students engage in critical thinking and cooperative learning and they learn curricular content through playing the game. Serious games, simulations, and commercial off the shelf games (COTS) can be extremely effective in teaching a variety of skills; these are described in more detail, below.

### Powerful game selections for your classroom:

- Introduce students to digital literacy @ [mediasmarts](#)
- [Minecraft Education Edition](#)
- [Classcraft](#)
- [Agents of Discovery](#)



<http://bit.ly/GameBased>



figure 7

Get serious about nutrition

"In 2002, the 'serious games' movement prompted partnerships among educators, the military, corporations, medical fields, and video game designers. This movement embraces the power of video games to attract, engage, connect, and teach game players critical content in the games' respective focus area" (Annetta, Murray, Laird, Borh, & Park. n.d). Serious games often involve simulation experiences and are not meant as mere entertainment. They teach skills connected to real-world events and give players a risk-free environment to fail, re-strategize, and learn from mistakes, without the fear of real-world consequence. "In essence, 'serious games' can be applied as an umbrella term for any game-based initiative that has an additional, 'serious' agenda" (What are serious games? 2017). Serious games often engage multiple players, adding another dimension of engagement through additional challenge. In the classroom, students can engage in serious game content to gain and practice thinking skills that are practical in real-life experiences--such as social injustice and global conflict.

## Serious Games...

a few trailers...  
[Energy 2020](#)  
[Trailer Merchants](#)  
[Energy Science](#)

### Serious game selections for the elementary classroom:

- [Mars Generation One: Argubot Academy](#)
- [Peter Packet: Social Activism Game](#)
- [Betwixt Folly & Fate](#)

"Simulations are a form of computer game that simulates something happening in real life" (Davis, 2014). Often part of serious games, the 'play' simulates a life experience where the player's decisions determine how the simulation unfolds. The feedback loop is immediate and continuous in simulation games. "By definition a simulation is an imitation" (Marchelletta, 2016). These games offer players experiences in everything from [exploring human cells](#), to [Medieval city building](#) to [bridge design and construction](#), and everything imaginable in between. Simulation games require a mixture of chance, strategy, and skill; they offer a safe environment to try ideas and experience activities that players may not in real life. Interacting with a lion in a simulation for example, is not a regular or safe activity for most people. Simulations can be played by multiple players who can engage in collaborative or competitive gaming, from any global location. The variety of simulation games available for entertainment and educational purposes are diverse and many; they are always improving and expanding into new experiences. Simulation games help students build knowledge and skills in a hands-on, simulated environment that they control. The classroom is just one of many places where hands-on, environment-life experiences support and deepen learning.

## Simulation



figure 8



<http://bit.ly/SimGameS>

## COTS

"COTS games are computer or video games created almost entirely for entertainment purposes, yet some COTS games are not absent of intellectual challenges or content" (Charsky, Mims, 2008).



figure 9

Teachers must be selective in game choice and ensure alignment to curriculum content, COTS can be effective learning tools when the goal of the game takes students through a valuable skill development and challenge, offers students feedback, and engages learners in critical thinking, reflection, and application of their learning. It is important to consider "the tasks that the learner/player needs to accomplish to advance in the game. They ought to be manageable, clearly stated, and broken down into smaller sub-tasks" (Kronenberg, 2016). COTS are a form of edutainment that easily engage students in FLOW - that magical place where time stands still and engagement is absolute.

## Commercial Off the Shelf Games

Some thoughts about COTS: The following set of criteria is meant as a guide for educators and researchers when selecting COTS games.

- motivation and flow
- clearly defined and spaced goals
- game skills and game mechanics
- content
- story and narrative
- multimodality
- agency
- course integration and scaffolding
- financial, technical, and administrative considerations

(Kronenberg, 2016)



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