





Games, Gamification and the Quest for Student Engagement



Version 4.0

Symbols and Icons

Below is a list of symbols and icons that will trigger you to important items within this Handout

Symbol/Word	Meaning
✓ Note	Important information for you to know or remember.
? Question	Write an answer or think about and write a response or ask a question.
 Write	Take notes or write information into your learner guide.
 Think	Think about a concept or idea.
 Definition	Definition of a term you should know.
 Play	Play a game or participate in an activity.

✓ **Note**

Research shows that longhand note takers engage in more processing than laptop note takers, thus selecting more important information to include in their notes, which enables them to study content more efficiently.

Muller, P. A. & Oppenheimer, D. M., The Pen Is Mightier Than the Keyboard: Advantages of Longhand Over Laptop Note Taking. Psychological Science 0956797614524581, first published on April 23, 2014

Objectives

In this workshop, seek answers to these questions:

- How can learn be interactive with a large group?
- What is the research-basis for using games for learning?
- What are three elements of game-based learning that lead to increased retention and learning?
- What are key theories that support gamification and game-based learning?
- What techniques can be used to increase learner interaction in the classroom?

? Question

What is your goal for the workshop? Write down your goals for the workshop and make sure the instructor is on-target with meeting your needs. If not, ask questions and make sure you gain what you'd like from the information presented.

What Research Says About Effectiveness of Games

The chart below summarizes the findings from the article Sitzmann, T. (2011) **A meta-analytic examination of the instructional effectiveness of computer-based simulation games.** *Personnel Psychology*. As indicated by Sitzmann, “Meta-analytic techniques were used to examine the instructional effectiveness of computer-based simulation games relative to a comparison group ($k=65$, $N=6,476$). Consistent with theory, post-training self-efficacy was 20% higher, declarative knowledge was 11% higher, procedural knowledge was 14% higher, and retention was 9% higher for trainees taught with simulation games, relative to a comparison group.

Type of Knowledge	% Higher with Simulation/Games
Declarative	11%
Procedural	14%

Sitzmann found that simulation games were 17% more effective than lecture and 5% more effective than discussion, the two most popular instructional methods in classroom instruction.

Type of Delivery	% Higher with Simulation/Games
Lecture	17%
Discussion	5%

Sitzmann goes on to indicate that “Trainees learned more, relative to a comparison group, when simulation games conveyed course material actively rather than passively, trainees could access the simulation game as many times as desired, and the simulation game was a supplement to other instructional methods rather than stand-alone instruction. However, trainees learned less from simulation games than comparison instructional methods when the instruction the comparison group received as a substitute for the simulation game actively engaged them in the learning experience.”

What Research Says About Effectiveness of Games

Game Element	Impact	Research Indicating Effectiveness
Gaming uncertainty (Chance)	Learners preferred activities that included an element of chance.	Howard-Jones, P.A., & Demetriou, S. (2008, September 11). Uncertainty and engagement with learning games. <i>Instr. Sci.</i> , 37, 519–536.
Challenge	Motivational to the learner. Caution: Too much or too little challenge will decrease learner’s perception of the training value.	Wilson, K. A., Bedwell, W.L, Lazzara, El. H., Salas, E., Burke, C.S., Estock, J. L., Orvis, K.L. & Conkey, C.(2009, April) Relationships Between Game Attributes and Learning Outcomes. <i>Simulation & Gaming</i> . 40(1). 217-266. Serrano, E.L., & Anderson, J.E. (2004). The evaluation of food pyramid games, a bilingual computer nutrition education program for Latino youth. <i>Journal of Family and Consumer Sciences Education</i> , 22(1), 1-16.
Assuming a role as an avatar	Change’s a person’s real-life perspective.	Yee, N., & Bailenson, J.N. (2006). Walk a mile in digital shoes: The impact of embodied perspective-taking on the reduction of negative stereotyping in immersive virtual environments. <i>Proceedings of PRESENCE 2006: The 9th Annual International Workshop on Presence</i> . August 24–26, Cleveland, Ohio.
Learner watching an avatar that looks like the learner	Influences the learner to perform a similar or the same activity in the future.	Fox, J., & Bailenson, J.N. (2009). Virtual self-modeling: the effects of vicarious reinforcement and identification on exercise behaviors. <i>Media Psychology</i> , 12, 1–25.
Flying around as a superhero	Influences a learner to be “nicer” in the physical world	Rosenberg, R.S. Baughman, S.L., Bailenson, J.N. (2013) Virtual Superheroes: Using Superpowers in Virtual Reality to Encourage Prosocial Behavior. <i>PLOS One.</i> , 8(1), 1-9.

What Research Says About Effectiveness of Games

Game Element	Impact	Research Indicating Effectiveness
Narrative Context	Motivates learner through content.	Dondlinger, M. J., (2007). Educational Video game design:A review of the literature. <i>Journal of Applied Educational Technology</i> . 4(1), 21-31.
Goals at different levels.	Motivates learner through content.	Dondlinger, M. J., (2007). Educational Video game design:A review of the literature. <i>Journal of Applied Educational Technology</i> . 4(1), 21-31.
Interactivity and Multisensory Cues	Gains attention and engages the learner.	Sitzmann, T. (2011). A meta-analytic examination of the instructional effectiveness of computer-based simulation games. <i>Personnel Psychology</i> , 64(2), 489–528.
Specific, immediate feedback.	Positively related to learner motivation and attitudinal valuing.	Ronen, M., & Eliahu, M. (2000) Simultiaotn-a bridge between theory and reality: The case of electrical circuits. <i>Journal of Computer Assisted Living</i> , 16, 14-26.

Design Takeaway Challenge

What design decisions, related to games were used in the presentation? Write the game attributes that you see in the spaces below.

Interactive Classroom Techniques



Write

What techniques do you use in your classroom to create interactivity? Name five. (You will be prompted during presentation.)

What Have You Learned So Far?



Write

What have you learned so far (reflective exercise)? (You will be prompted during presentation.)

Types of Gamification

Gamification has been defined as the “process of using game thinking and mechanics to engage audiences and solve problems” (Zichermann, 2010), “using game techniques to make activities more engaging and fun” (Kim, 2011), and “the use of game design elements in non-game contexts” (Deterding et al., 2011, p. 1). From an instructional context, the most relevant definition is one that combines elements from these definitions and defines gamification as “using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning, and solve problems” (Kapp, 2012, p. 10). “Gamification” is a broad term that can be further refined into two types, Content Gamification and Structural Gamification.

Content Gamification

“Content gamification is the application of game elements, game mechanics and game thinking to alter content to make it more game-like” (Kapp et al., 2013, p. 237). A common implementation of this type of gamification adds elements, such as story, mystery, and characters, to content to engage the learner. For example, content gamification could be realized by embedding a series of math problems in a fantasy narrative or by starting a classroom dialogue with a verbal challenge instead of a list of objectives. All of these added attributes positively influence a learner’s emotional state and generally enhance motivation and facilitate learning and performance (American Psychological Association Work Group of the Board of Educational Affairs, 1997). While content gamification includes many intrinsically motivating elements and can be effective from a learning perspective, the majority of vendors within the field have focused on Structural Gamification.

Structural Gamification

“Structural gamification is the application of game-elements to propel a learner through content with no alteration or changes to the content” (Kapp, Blair, & Mesch, 2013, p. 224). The content does not become game-like; only the structure around the content does. A common implementation of this type of gamification adopts the scoring elements of video games, such as points, levels, badges, leaderboards, and achievements, and applies them to an educational context (Nicholson, 2012).

Structural gamification’s continual, real-time assessment of progress provides important information to both the learner and the administrators of the instruction as learners complete portions of content, takes quizzes to gauge knowledge acquisition, and moves toward the prescribed educational goals. The continual assessment of progress helps identify strengths and weaknesses. For example, an instructor employs structural gamification when learners are assigned content to be learned through a daily quiz-type game for a period of time via email or, more likely, a mobile app. If the learner answers correctly, they earn points and progress toward earning a digital badge. If they answer incorrectly, they are immediately presented with a short instructional piece specifically addressing the question’s topic. Questions are repeated at various intervals until the learner demonstrates mastery of the topic.

References:

- American Psychological Association Work Group of the Board of Educational Affairs. (1997). *Learner-centered psychological principles: A framework for school reform and redesign*. Washington, DC: American Psychological Association.
- Deterding, S., Khaled, R., Nacke, L. E., & Dixon, D. (2011, May). Gamification: Toward a definition. In *Proceedings of CHI 2011 Gamification Workshop* (pp. 1–4). Vancouver, BC, Canada.
- Kapp, K. M. (2012). *The gamification of learning and instruction: Case-based methods and strategies for training and education*. New York, NY: Pfeiffer.
- Kapp, K. M. (2013). Once again games can and do teach. *Learning Solutions Magazine*. Retrieved from <http://www.learningsolutionsmag.com/articles/1113/once-again-games-can-and-do-teach>.
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- Kim, A. J. (2011, March 23). Gamification 101: Designing the player journey [Video file]. Retrieved from <http://youtu.be/B0H3ASbnZmc>.
- Nicholson, S. (2012, June). A user-centered theoretical framework for meaningful gamification. Paper presented at Games+Learning+Society 8.0, Madison, WI.
- Zichermann, G. (2010, October 26). Fun is the future: Mastering gamification [Video file]. Retrieved from <http://www.youtube.com/watch?v=6O1gNVeaE4g>.

ELEMENTS OF INTERACTIVE LEARNING

Here are elements of effective learning, these can be part of gamification or part of a well design interactive lesson.

- Spaced Retrieval-Spacing out content over time.
- Retrieval Practice-Testing or quizzing learners rather than re-reading or re-listening.
- Require Action in Your Learning—Involve learners as soon as possible.
- Challenge-Force learners to overcome obstacles.
- Flow-Immerse the learner in the activity with clear goals, multiple methods of achieving the goals and an opportunity to concentrate.
- Fantasy-Don't be afraid to include fantasy elements.
- Risk-Have the learner put something at risk. It could be starting over, risk of not finishing a task or risk of losing points.
- Action-Make the learner do something such as: write a proposal, answer a question, solve a problem, make a decision, confront a challenge, solve a mystery, have a hands-on activity.
- Create Open Loops-Start with questions and challenges rather than objectives.

Tell a Story

Storytelling, classroom (or even online instruction) and presentations have a lot in common. In fact, in many areas they have a high degree of overlap. In presentations we have an agenda, in a story we have a plot. In the classroom we have a lesson plan. In presentations we have goals or information we want to impart, in a story we have a morale or an underlying theme or symbolism. In the classroom we have a desired learning outcome.

Elements of a Story

To create a good story, the following elements must be present:

- Characters
- Plot (something happens)
- Tension
- Resolution
- Conclusion

Adding these elements together creates an effective story for a presentation. In fact, research shows that people remember and act upon facts more easily when those facts are contained in a story than when the facts are presented in a list.

According to an article in the May 22, 2007 issue of the *New York Times*, an article titled ***This is Your Life (and How You Tell It)*** psychologists are starting to research how people tell their life stories as a method of gaining insight into the personalities of people and understanding how they learn.

The article notes that:

Researchers have found that the human brain has a natural affinity for narrative construction. People tend to remember facts more accurately if they encounter them in a story rather than in a list... and [individuals] rate legal arguments as more convincing when built into narrative tales rather than on legal precedent.

Questions

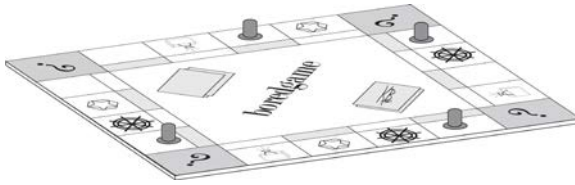
Story creation steps:

1. Identify Learning Objective
 - Choose Only One
2. Choose Characters (Teacher or Learner)
3. Create Plot (What Happens)
4. Develop Questions (Advance Plot)
 - Only use one-two questions.
5. Create Tension (Between Characters)
6. Develop Resolution

Questions

1. What is the learning objective of this activity?
2. How is it assessed? How will you know exercise is successful?
3. What is the plot? What happens during the activity? Where does the story take place?
4. What kind of questions do the learners need to answer, what activity are they performing?
5. What causes tension within the learning activity (Mystery, Competition, Racing Against the Clock, etc.?)
6. What are the opportunities for learner reflection?

Putting It All Together



Write

Write a brief description of your interactive activity.

Action Items



Write

Three things you are going to implement based on today's workshop. Provide an estimated date.

I AM GOING TO IMPLEMENT....		BY THIS DATE
1		
2		
3		

TO FURTHER YOUR KNOWLEDGE AND SKILL BASE

Blogs and Articles

Kapp Notes

<http://karlkapp.com/kapp-notes/>

Think Like a Game Developer:

http://www.nxtbook.com/nxtbooks/trainingindustry/tiq_2011fall/index.php?startid=33

Five Game Elements for Effective e-Learning:

http://www.nxtbook.com/nxtbooks/trainingindustry/tiq_2012fall/index.php?startid=31

If you have Lynda.com search for “Gamification of Learning Course” and “How to Increase Learner Engagement.”

Karl Kapp Books

- Gadgets, Games, and Gizmos for Learning by Karl Kapp
- The Gamification of Learning and Instruction by Karl Kapp
- The Gamification of Learning and Instruction Fieldbook by Karl Kapp, Lucas Blair and Rich Mesch

Other Good Books

- The Art of Game Design: A book of lenses by Jesse Schnell.
- Challenges for Game Designers by Brenda Brathwaite, Ian Schreiber.
- Game Development Essentials by Jeannie Novak
- Game Design Workshop: A Playcentric Approach to Game Design by Tracy Fullerton

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