Principles of (Video) Games That Are Useful to Teaching

Display Progress
- reward effort, not just success
- reward after fixed intervals (eg, every five tokens) but also randomly
- momentary rewards ("great job" flashes on screen) or persistent rewards
- provide rewards in the form of badges – people are natural collectors
- use progress bar if not using a badge list
- show progress summary not only when initially accomplished, but in a global spot that is easy to access later (and visible publicly to other participants)

Maximize Competition
- motivation through innate competitiveness
- leaderboard
- beware FERPA issues

Calibrate difficulty Carefully
- "balance" issues – neither boring nor anxiety-inducing
- early, easy wins, then ratchet up difficulty
- add skills incrementally
- return to early skills with spaced repetition
- boss levels

Provide Diversions
- mini-games reset the attention clock
- reward exploration via Easter Eggs (example: humorous ALT text on images)
- your word choices: "quests" rather than "objectives"
- allow for nonlinear (or branching) progress toward the goal?
- where practical, EMBED games and other content rather than link away

Employ Narrative Elements
- start with a hook (high concept, "elevator pitch")
- determine a central conflict that drives the storyline
- think in terms of Set Up, Build Up, and Payoff
- do not tell a story so much as construct a mystery (start "in medias res"?)
- imagine characters, backstories, and use as many details as possible

Methods of Gamification

Type I – Individual (Easter Eggs)

1. Link to Instablogg.com post "hidden" as white on white background
2. Relay location of link (under a period) in German, with no translation
3. URL hidden in the TITLE (mouseover) tag of a picture
4. No-copy script on one HTML page so that naked URL visible, but not clickable
5. Naked URL visible but has an "empty" three space—if copy/pasted, those three spaces turn out not to be empty after all but contain letter that were white on the page and thus invisible.
6. Link within a paragraph masquerades as a "more information" link but goes to a YouTube recording, which shows a static image and a voiceover slowly saying the Instablogg URL to actually visit.
7. Link hides in small font at the bottom of a REALLY long HTML page
8. Link expressed in example dot com form in the midst of a long paragraph and not underlined.
9. QR code with no explanation

Easter Egg ideas NOT used (yet)

10. The next page links to #anchor tag so you are jumped down the page and have to scroll up to see more.
11. A series of delayed auto-forwards within HTML just gives you enough time to read one word per page
12. Feedback for a practice quiz says where to go
13. "Subliminal' messages flash every few seconds in webcam video, saying the URL bit by bit
14. URL hides in the page background as an image (bgbackground), faded, set on repeat

Type II – Team (Shared Badges)

1. First discussion post
2. Best challenge tech
3. First perfect test of the week
4. First perfect Easter egg hunt of the week
5. Best question on DB
6. Best answer on DB
7. Most interesting DB contribution of the week
8. Greatest number of "perfect score" Easter egg quizzes after 1 day
9. Most amount of perfect scores on test at end of week
10. Person with most DB posts for the week

Contents of My Easter Eggs

1. The true meaning of Rumplestilskin
2. The true meaning of Red Riding Hood
3. The true meaning of Hansel and Gretel
4. Christmas Trees explained
5. Easter Eggs and the Easter Bunny explained
6. Jack 'o Lantern explained
7. Turkey as symbol for Thanksgiving explained
8. YouTube embed of "Evolution of Dance"
9. Embed of Slideshare: images from Cakewrecks.com
10. Embed of Slideshare: images from Somuchpun.com
11. Embed of Slideshare: images from Damnyouautocorrect.com
12. Embed of Slideshare: images from Fail blog
13. "Achievement Unlocked" bonus Level-Up content: slideshow analysis of all OTHER Disney movies, using the tools of this class

Lessons Learned

Gamification
1. Give an early badge for finishing all Easter eggs (team w/ the most perfect scores on egg quiz after 24 hours) to encourage other teams
2. Created an "achievement unlocked" set of content to give motivation for doing all perfect Easter eggs (they can see it's there, but not what is in it, from the start)
3. Had to tie the bonus content to 'finishing' other modules, meaning they had to be set so it's finished not when the TEST is done, but when the egg quiz is 100%
4. "Fight Club" style rule: do not talk about Easter Eggs on discussion boards.
5. Had to install rules about "only earn one badge" to prevent eager beavers from dominating
6. Easter eggs were frustrating: had to 'give away' the answers in the last week but not let them know ahead of time I would do that. Made a screencast of showing how to find all eggs.

Scale (Number of Participants)
7. Every assessment had to be self-grading (implies low rigor. This course offered no completion certificate)
8. Had to use the "Harry Potter house method" to avoid too much manual badging
9. Eggs could not be badged individually, but tracked by "quiz" and were rewarded with "Achievement Unlocked" extra content of interest

10. Only perform manual tasks (giving badges) once per week and do not revisit older content in the course

Technology
11. Use Instablogg – permanent URL, doesn't give anything away with name of URL, and URL can't be guessed
12. YouTube is blocked for some users (domains, intranet, browsers)
13. YouTube embed didn't always work; need to provide naked URL as well
14. Limitations on auto-grading. Email from student: "why won't it accept my answers" (he was inputting "Egg1A keyword: Candle" rather than just "candle")
15. YouTube (even 'unlisted') could be stolen; using locally-hosted SFW safer, but some devices won't play it.
16. Some Easter eggs hid in ways that only a browser and mouse could see (no smartphone, no iPad)

International Scope
17. Email: "what are Easter eggs"? (not all cultures understand the concept)
18. Need to provide captions to video lectures, even without accommodation requests
19. Many explanations (lectures) that provide context to a new subject turn out to be highly America-centric in assumptions. The "we" has to be re-thought when typing (or lecturing) on almost any topic.

Gamification Bibliography

Aldrich, Clark. "Engaging Mini-Games Find Niche in Training." *T+D* 61.7 (2007): 22-24. Web. 10 Feb. 2012.

Carlson, Scott. "Video Games Can Be Helpful to College Students, a Study Concludes." *The Chronicle of Higher Education: Technology*. 15 Aug. 2003. Web. 6 Dec. 2011.

Chapman, Paige. "A Game Eases the Pain of Cramming for Chemistry." *The Chronicle of Higher Education: Teaching*. 31 Oct. 2010. Web. 6 Dec. 2011. http://chronicle.com/article/A-Game-Eases-the-Pain-of/125179/

Chou, Yu-kai. "Octalysis: Complete Gamification Framework." Web. 13 Feb. 2013. http://www.yukaichou.com/gamification-examples/octalysis-complete-gamification-framework/

Coller, B.D. and M.J. Scott. "Effectiveness of Using Video Game to Teach a Course in Mechanical Engineering." *Computers & Education* 53.3 (2009): 900-912. Web. 6 Dec. 2011. http://www.sciencedirect.com/science/article/pii/S0360131509001201

Criswell, C. (2009). "Can video games be educational?" *Teaching Music* 16(6): 24.

Debolt, David. "How Video Games Can Help in the Classroom, and in the World." *The Chronicle of Higher Education: Technology*. 24 Oct. 2008. Web. 6 Dec. 2011. http://chronicle.com/article/How-Video-Games-Can-Help-in/5598

Duque, Gustavo, Shek Fung, Louise Mallet, Nancy Posel and David Fleiszer. "Learning While Having Fun: The Use of Video Gaming to Teach Geriatric House Calls to Medical Students." *Journal of the American Geriatrics Society* 56.7 (2008): 1328-1332. Web. 08 Feb. 2012.

Edmonds, S. (2011). "Gamification of learning." *Training and Development in Australia* 38(6): 20-22.

Gee, J. P. (2009). "Deep Learning Properties of Good Digital Games How Far Can They Go?" In *Serious games: Mechanisms and effects*. New York and London: Routledge.

Huang, Ling Yi. (2011). "Designing Serious Games to Enhance Political Efficacy and Critical Thinking Disposition for College Students: The Case of Taiwan," *Third International Conference on Games and Virtual Worlds for Serious Applications*, pp.148-151.

Jensen, Matthew. "Engaging the Learner: Gamification Strives to Keep the User's Interest." *T+D* 66.1 (2012): 40-44. Web. 08 Feb. 2012.

Kapp, Karl. (2012). *The gamification of learning and instruction: Game-based methods and strategies for training and education*. San Francisco: Pfeiffer.

Kellner, G.; & Weißenbacher, A. (2012). "GETOLS: Game Embedded Testing of Learning Strategies," *2012 IEEE Fourth International Conference on Digital Game and Intelligent Toy Enhanced Learning (DIGITEL):* 9-16.

Landers, R. N., & Callan, R. C. (2011). "Casual Social Games as Serious Games: The Psychology of Gamification in Undergraduate Education and Employee Training." In *Serious Games and Edutainment Applications* 399-423, Springer: London.

Michael, D., Chen, S. (2006). *Serious games: Games that educate, train, and inform*. Thomson Course Technology.

Prensky, M. (2000). *Digital game-based learning*. New York: McGraw-Hill.

Renaud, C., & Wagoner, B. (2001). "The gamification of learning." *Principal Leadership*, 12(1) 56-59.

Ritterfeld, U., Cody, M., Vorderer, P. (2009). *Serious games: Mechanisms and effects*. New York and London: Routledge.

Salter, Anastasia. "Games in the Classroom (Part 3)." *The Chronicle of Higher Education: ProfHacker*. 30 Sep. 2011. Web. 6 Dec. 2011 http://chronicle.com/blogs/profhacker/games-in-the-classroom-part-3/36217

Salter, Anastasia. "How to 'Gamify' Your Class Website." *Profhacker*. The Chronicle of Higher Education, 21 Feb. 2011. Web. 08 Feb. 2012.

Sanchez, Alicia. "Games for Good—How DAU is Using Games to Enhance Learning: Games and Simulations at DAU." *Defense A R Journal* 16.3 (2009): 342. Academic OneFile. Web. 10 Feb. 2012.

Smith-Robbins. " 'This Game Sucks': How to Improve the Gamification of Education." *Educause Review* 46.1 (2011): 58-59. Web. 08 Feb. 2012.

Squire, K. (2008). "Open-ended video games: A model for developing learning for the interactive age." In K. Salen (Ed.) *The John D. and Catherine T. MacArthur Foundation series on digital media and learning*. (167-198) Cambridge, MA: The MIT Press.

Taylor, Chris. "The Yolk's on Us." *Time* 155.14 (2000): 148. Web. 10 Feb. 2012.

Whitton, Nicola. "Game Engagement Theory and Adult Learning." *Simulation & Gaming* 42.5 (2011): 596-609. Web. 08 Feb. 2012.