Birch, Heather J.S. "Rise of the Rhythm: Using Gamification to Engage and Motivate Music Students." *The Recorder* 56, no. 4 (2014): 11-15.

Rise of the Rhythm

Using Gamification to Engage and Motivate Music Students

Heather Birch

*This article has gone through a blind peer-review process.

Congratulations to Megatron and HulaGirl88 who have just beat Level 2! While this sounds like an exclamation that might be heard in a video game, it was actually spoken by an avatar in my junior music classroom during the game, Rise of the Rhythm (Birch, 2013).

In the past month, 90% of Canadian students aged 6 to 17 have played a video game (Entertainment Software Association, 2013). What exactly is it about video games that attracts players, and supports continuous, extended play? Some of the game elements and design techniques which are part of video games and which make them alluring include opportunities for mastery learning, immediate feedback, PBL's (points, badges, leaderboards), player control, narrative, and social media tools (Kapp, 2012). There are well-established research claims about the learning potential inherent in video game play, (Gee, 2003; Green & Bavalier, 2012), and on why children are motivated to play games, (Olson, 2009; Hamlen, 2011; Ferguson & Olson, 2013). But are there specific elements of those games which might be effective motivators or learning tools that could be useful in a context outside of a game, such as a music classroom? Finding the answer to this question is a goal of "gamification."

Gamification is the process of defining the elements which characterize games that make them fun and motivational, and using those same elements in a non-game context to influence behaviour (Deterding, Dixon, Khaled, & Nacke, 2011). In a non-game context such as a classroom, gamification does not involve specific educational games, but rather, makes use of a "game layer" which operates in coordination with student learning. In addition, gamification is not simply a mechanism for offering students rewards for certain behavioural responses. Rather, it takes into consideration the variety of complex factors that make a student decide to act; gamification is a multifaceted approach which recognizes psychology, design, strategy, and technology (Werbach, 2012).

In this article, I will introduce a gamification platform called Rise of the Rhythm. I developed this platform to support and motivate music students in grades 4 and 5 as they learned to play the recorder. The article describes the game elements and design techniques used in the platform, and examines the benefits and challenges encountered throughout the game.

Rise of the Rhythm

During a six-week unit, 125 Junior division music students, ages 9 through 11, developed their skills as recorder players. Concurrently the website, www.riseoftherhythm.com, functioned as the gamified system by tracking student progress, noting their accomplishments, and prompting them to practice and achieve personal goals.

Tracking Progress

Rise of the Rhythm tracked student progress in two ways. First, the rules of the game set out a series of musical achievements in order of increasing difficulty. Pieces from Philipak and Jennings' (2002) recorder method book were used to represent the first eight levels in the game. "Recruits" were instructed to master each musical example in order before moving on to the next levelled selection. Once players reached Level 9, they became Masters, and could choose from a collection of several pieces in assorted major and minor keys with complex articulation patterns, rhythms and dynamics, and could also choose from a variety of solos, duets and trios. To "win" the game, players were responsible for mastering all eight Recruit Level pieces and any eight Master Level pieces.

Rise of the Rhythm also tracked student progress through a discrete web page for each player where they created a personal avatar and game name. Students generated a set of criteria which described what successful mastery of a recorder piece would sound like, and applied it to assess their own readiness to perform each piece for feedback. If students had mastered the piece, they were given points which appeared on their web page, and were added to their team score. Figure 1 depicts a grade 5 student's web page, and indicates the game name she chose for herself, GreenAlien, as well as her mastery of Level 8.

The tracking mechanisms in Rise of the Rhythm incorporate the game elements of PBL's (points, badges, leaderboards), immediate feedback, player control, and mastery learning. While this game did not have a leaderboard, students often

Figure 1. A screenshot of a player's personal Rise of the Rhythm webpage. Used with permission.

clicked on the web pages of their teammates and opponents to view their progress. Students received direct, individualized instruction to help them reach their next musical milestone. Upon succeeding, their web page was updated to reflect their achievement. Students experienced a sense of control in the game since they played at their own pace. Once they reached Level 8, they charted their own course, choosing from a variety of pieces to perform, or searching for other pieces they wanted to learn. The mastery learning system did not necessitate that students only practiced one piece at a time; often they were excited to jump ahead and try more difficult pieces. Still, they were asked to perform each piece for me in sequential order, in the same way that video games often require players to master one level before moving ahead to the next. Some of the benefits of mastery learning for students include improved attitudes toward the material learned in class (Kulik, Kulik, & Bangert-Drowns, 1990) and increases in self-efficacy (Ritchie & Williamon, 2011).

Sharing Accomplishments

Students were organized into teams according to their classroom groupings, and were named Team Arpeggio, Team Staccato, Team Glissando, Team Rubato, and Team Crescendo. When students mastered a piece they recorded it using the classroom iPad, or their own device, and uploaded it to their team web page playlist. Those recordings functioned as artifacts in the digital portfolio of each team, documenting their progress and success. Audio recordings of successfully mastered pieces could be revisited and listened to repeatedly. Recordings could also be "liked" by anyone who listened, as well as commented on, and shared on various social media platforms. While practicing their instrument, many students figured out how to play their favourite songs by ear, which they performed for bonus points, and recorded for upload to their web pages.

Motivating Students

The novelty of gamification provides intrinsic motivation for the students to become involved in the learning process. As students entered the music classroom, the Rise of the Rhythm theme song, an epic orchestral soundtrack, was routinely played to signal the start of game play. By video message, a game character delivered an instruction or a challenge to the players on the first day of each week. For example, my own avatar was a character in the game that gave encouragement to the players and reminded them of the rules of play. Another character, Otis Overblow, had villainous intent; he "blackmailed" players, notifying them that if every team member reached Level 1 by the end of the week, he would not steal any of their points.
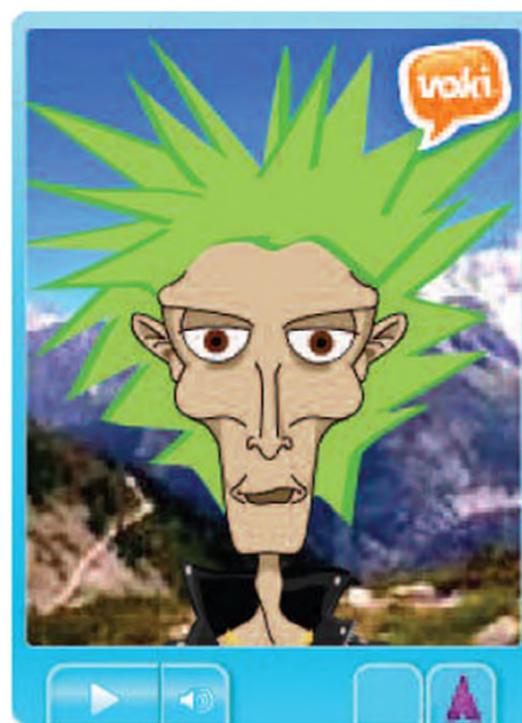
Figure 2. The game villain, Otis Overblow. Scan this picture with the Aurasma app to hear Otis' warning message for players. Used with permission.

Benefits

Direct benefits of the gamified music-learning environment included differentiation and collaboration. Levelled musical selections were mastered by different students at different rates providing for differentiated instruction. Students working at the same level naturally formed groups to help one another, both because they enjoyed sharing their musical learning, and because it was in the best interest of their team score. Players consistently helped others with pieces they had previously mastered themselves. Shouts of celebration were heard when a Master player beat a high level that no one had yet reached. But just as loud were the cheers for a Recruit who practiced Level 1 for two full weeks, and finally mastered that level. While students performed at a variety of levels, and their progress was visible and comparable, the game was a great equalizer. The students correctly perceived that each person was working at the edge of their understanding and ability, at their ideal musical developmental level. This differentiated, collaborative environment provided specific, just-in-time peer learning for students, as well as freed me to listen to individual players and provide focused, customized instruction.

While I cannot compare my students' achievement results with those of a control group of recorder players who was not playing Rise of the Rhythm, I did experience the students' excitement each day as they rushed into the classroom to hear the weekly message. I heard the exclamations of "YES!!!" when students mastered long-practised pieces. I observed my students offering to help one another, and adopting a variety of strategies to teach one another, and to learn to play.

Intrinsic and Extrinsic Motivators

I would be naive to think that the only reason my students practiced was to move up a level in the game or to keep Otis Overblow from stealing points from their team. Motivation is a complex construct in which intrinsic and extrinsic motivators often operate as inextricably linked components that work together to cause a person to act (Deci & Ryan, 2008). When used in coordination with intrinsic motivation, extrinsic motivators can be effective tools for motivating music students to practice. The extrinsic motivators in these games include points and levels, and recognition from peers, parents, and other visitors to the students' web pages. But these points and levels are not easily attained. It is a complex process to learn to play a piece, and the sense of satisfaction students gain after working hard to do so is a strong motivator (Bruner, 1960). I observed my students' innate drive to learn and to develop skills, in conjunction with the chance to earn points, to track and share their progress, and have a digital record of that progress. Together, these opportunities functioned as a powerful motivational mix that led to focused practice time and steady musical achievement.

Challenges

One of the challenges we experienced throughout the game
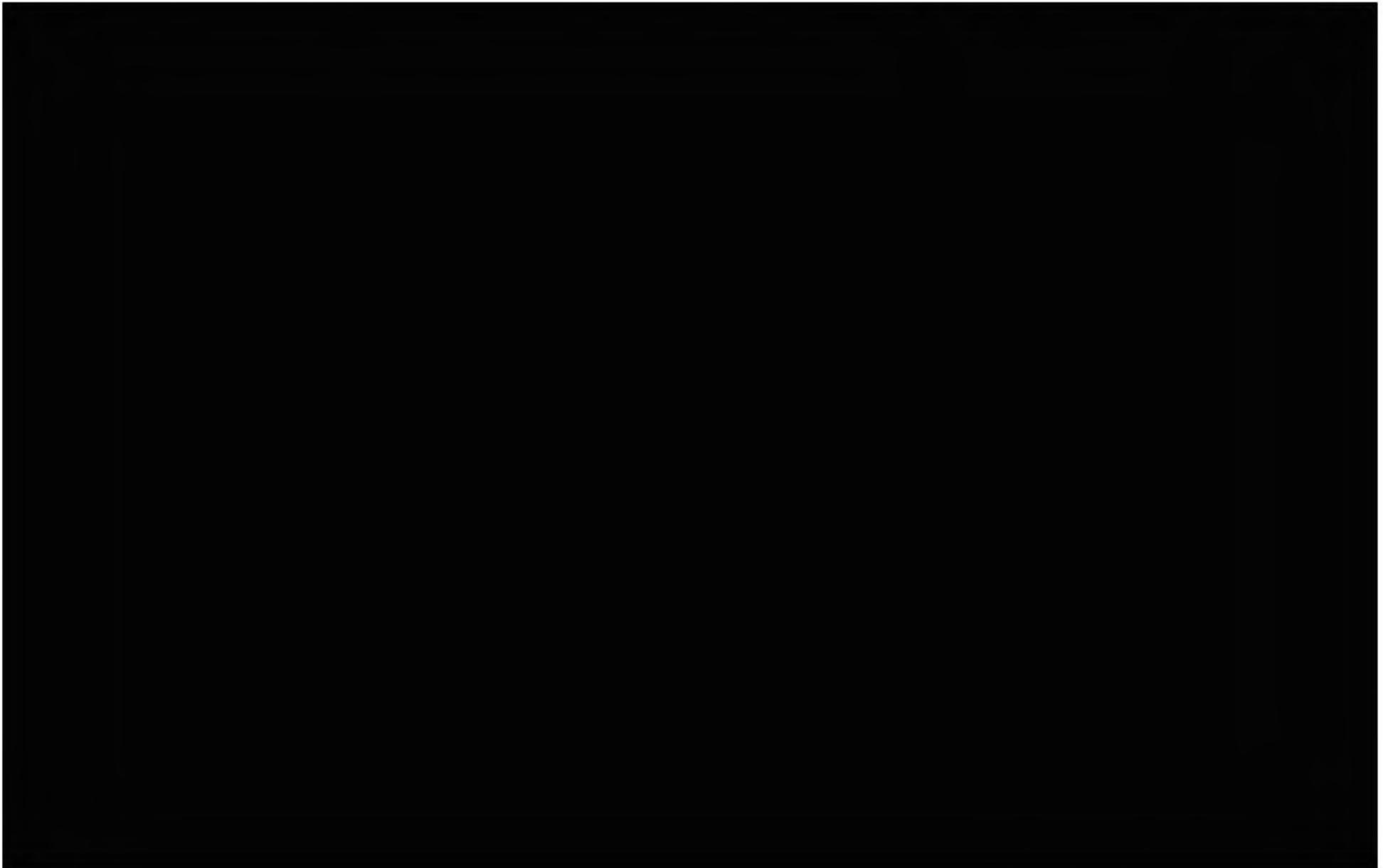
was the timbre and volume generated by 25 students simultaneously practicing a variety of different recorder pieces. Usually, two small groups of students practiced in the hallway, which dispersed the sound, but by no means completely reduced the chaos. In my role as teacher, however, I had no desire to take control of the situation. The chaos was the embodiment of productive learning.

After playing the game for two weeks, I invited each student to articulate a personal goal, asking them to predict which level they would reach. Some students hoped to reach Level 3 by the end of the unit, while many hoped to reach Level 8. A few students aspired to beat all 16 levels of the game. One player, Bunny99, actually did! While I conferred with students regularly and we shared ideas about how to reach their musical goals, the discourse was purely verbal. The Rise of the Rhythm platform did not provide the means for students to record their learning goals, their frustrations, and their thoughts about the learning process, as they were experiencing it. A redesign of the platform would definitely include an integrated journaling tool. When the game was over, the opportunity to reflect on whether they achieved their goal or not, and why, would have been enhanced by the opportunity to look back over a written record of their reactions to and experiences of the learning process.

Ways to Use Game Elements in the Music Classroom
While many of your music students may already be motivated to practice and not require scaffolding to achieve musical goals, some may indeed benefit from the structure and encouragement that gamification can provide. All of your students have the potential to experience the fun of working toward shared goals, laughing at game characters, and sharing their success with a worldwide audience. Gamification is not the perfect solution in every learning circumstance, and the long-term effects, particularly in the context of music learning, have not yet been firmly established by formal research. However using gamification in short-term, relevant cases, is an acknowledgement that large numbers of our students are game players, which shapes their identity as people and as learners (Ito, 2012; Boyd, 2014; Zichermann, 2014). Within video game play, the game elements and design mechanics operate to provide players with opportunities for autonomy, competence, and relatedness, (Ryan & Deci, 2000), which are extremely powerful psychological needs. Within games, our students have these needs met. Providing comparable opportunities in the classroom acknowledges our students' unique status as 21st century learners (Gee, 2012; Whitaker & Bushman, 2011).

Here are five ways to incorporate gamification into your music-learning context which may result in increased student motivation, student learning and musical achievement.

1. Assign each of your music classes a team name, or allow them to choose one. Even if they are not competing with other teams, a sense of collective cognitive responsibility (Scardamalia, 2002) can develop when learning challenges and goals are framed in terms of a team working together toward a common goal. This collaborative atmosphere reflects a common mechanic in video games where players must work together to achieve missions and solve mysteries (Gee, 2003).

2. Designate a theme song which is played, or which the students play, to signal the start of a specific learning challenge. For example, class time specifically allotted for learning theory can always begin with this theme song. Literature concerning video game music shows that it is an important element which can affect emotional engagement (Wharton & Collins, 2011), foster feelings of "presence" (Collins, 2011), and evoke narrative (Gibbons, 2011). Using music, not just as the subject to be learned, but as a cue for specific learning activities can cultivate these community-building benefits in the music classroom.

3. Allow students to choose the pieces they learn to play. Video game players have a sense of agency as they manipulate their avatar and make choices about how to proceed through a game; our students can have a similar sense of agency if they are given choices about the music they will learn and perform for the class, or together as a class (Green, 2006; 2009).

4. Upload recordings of successful musical performances to your blog where they can be rated, liked, and shared. A web tool and mobile application designed to easily facilitate this is SoundCloud, www.soundcloud.com. Video game players interact in online spaces where they share knowledge and expertise, and help one another succeed in the game. These community spaces take the form of blogs, wikis, and information forums; community members learn from one another, and have an authentic audience for their thoughts and ideas. Music students who have these same opportunities to share and learn from one another will have an enhanced experience that reflects that of "gamer" communities.

5. Track student progress toward musical goals by using an online gamification platform such as www.classbadges.com, www.classdojo.com, www.classcraft.com, or www.3dgamelab.com. These platforms, on their own, will not motivate students. If a video game has nothing new to experience or master, a player is likely to lose motivation and quit playing (Koster, 2005). No system of points, recognition or interesting narrative will keep a player engaged if they are no longer learning. Likewise, our music students may be supported and encouraged by gamified systems, but the most decisive factor in their development as musicians is ultimately, their progress toward the goal of learning to make music.

References

Birch, H. (2013). Rise of the Rhythm. Retrieved from: www.riseoftherhythm.com

Boyd, D. (2014). *It's complicated: The social lives of networked teens.* New Haven, CT: Yale University Press.

Bruner, J. (1960). *The Process of education.* Cambridge, MA: Harvard University Press.

Collins, K. (2011). Making gamers cry: Mirror neurons and embodied interaction with game sound. Proceedings from A Conference on Interaction with Sound: *6th Audio Mostly Conference,* New York, NY.

Deci, E. L., & Ryan, R. M. (2008). Facilitating optimal motivation and psychological well-being across life's domains. *Canadian Psychology, 49*(1), 14-23.

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining "gamification." Proceedings from Envisioning Future Media Environments:*15th International Academic MindTrek Conference (MindTrek '11).* New York, NY.

Entertainment Software Association. (2013). Essential facts about the computer and video game industry. Retrieved from http://www.theesa.com/facts/pdfs/ESA_Essential_Facts_20 10.PDF

Ferguson, C., & Olson, C. (2013). Friends, fun, frustration and fantasy: Child motivations for video game play. *Motivation and Emotion, 37*(1), 154-164. doi: 10.1007/s11031-012-9284-7

Gee, J. P. (2003). *What video games have to teach us about learning and literacy.* NY: Palgrave MacMillan.

Gee, J. P. (2012). Video games: What they can teach us about audience engagement (Report). T*he Neiman Foundation for Journalism at Harvard.* Retrieved from: http://www.google.com/url?q=http%3A%2F%2Fwww.niem an.harvard.edu%2Freports%2Farticle%2F102418%2FVid eo-Games-What-They-Can-Teach-Us-About-Audience-Engagement.aspx&sa=D&sntz=1&usg=AFQjCNEi_LWYvHP QbdNNSMJU9Rpq61_zyg

Gibbons, W. (2011). Wrap your troubles in dreams: Popular music, narrative, and dystopia in Bioshock. I*nternational Journal of Computer Game Research, 11*(3).

Green, C. S., & Bavelier, D. (2012). Learning, attentional control, and action video games. *Current Biology, 22*(6), 197-206. doi: 10.1016/j.cub.2012.02.012

Green, L. (2007). *How popular musicians learn: A way ahead for music education.* Ashgate Publishing, Ltd..

Green, L. (2009). *Music, informal learning and the school: A new classroom pedagogy.* Ashgate Publishing, Ltd..

Hamlen, K. R. (2011). Children's choices and strategies in video games. Computers in *Human Behavior, 27*(1), 532-539. doi: 10.1016/j.chb.2010.10.001

Ito, M., Baumer, S., Bittanti, M., Cody, R., Herr-Stephenson, B., Horst, H. A., ... & Tripp, L. (2010). Hanging out, messing around, and geeking out. *Digital media.*

Kapp, K. L. (2012). *The gamification of learning and instruction.* San Francisco, CA: Pfeiffer.

Koster, R. (2005). *A theory of fun for game design.* Scottsdale, AZ: Paraglyph Press.

Kulik, C. L. C., Kulik, J. A., & Bangert-Drowns, R. L. (1990). Effectiveness of mastery learning programs: A meta-analysis. *Review of Educational Research, 60*(2), 265-299.

Olson, C. K. (2009). Why do boys like to play video games? *Pediatrics for Parents, 25*(3/4), 27-29.

Philipak, B. Jennings, P. (2002). *Recorder Karate: A Highly Motivational Method for Young players.* Wauwatosa, WI: Plank Road Publishing.

Ritchie, L. & Williamon, A. (2011). Primary school children's self-efficacy for music learning. Journal of Research in *Music Education, 59*(2), 146-161.

Ryan, R., & Deci, E. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68.

Scardamalia, M. (2002). Collective Cognitive Responsibility for the Advancement of Knowledge. In B. Smith (Ed.), *Liberal Education in a Knowledge Society*, 67-98. Chicago, IL: Open Court.

Siemens, G. (2004). Connectivism: A learning theory for the digital age. elearnspace. Retrieved from: http://www.ingedewaard.net/papers/connectivism/2005_sie mens_ALearningTheoryForTheDigitalAge.pdf

Werbach, K. (2012). *Why study gamification?* Video lecture of Kevin Werbach, University of Pennsylvania, Coursera. https://www.coursera.org/course/gamification

Wharton, A., & Collins, K. (2011). Subjective measures of the influence of music customization on the video game play experience: A pilot study. *The International Journal of Computer Game Research, 11*(2), 39-46.

Whitaker, J. L., & Bushman, B. J. (2011). "Remain calm. Be Kind." Effects of relaxing videogames on aggressive and prosocial behavior. *Social Psychological and Personality Science, 3*(1), 88-92. doi: 10.1177/1948550611409760

Zichermann, G. (2011). How Games Make Kids Smarter. TED. Retrieved from: http://www.ted.com/talks/gabe_zichermann_how_games_m ake_kids_smarter