

## How Can Gamification Improve Learning Within an Online Course?

OLTD 508

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Becker, K. & Nicholson, S. (2016). Gamification in the classroom: Old wine in new badges. In K. Schrier (Ed), *Learning, Education and Games Volume Two: Bringing Games into Educational Contexts* (section 3). Retrieved from [https://oltd508lewis.weebly.com/uploads/8/2/7/9/8279059/learning-education-games-2\\_schrier-et-al-web.pdf](https://oltd508lewis.weebly.com/uploads/8/2/7/9/8279059/learning-education-games-2_schrier-et-al-web.pdf)

Becker and Nicholson point out the difference between reward-based gamification and meaningful gamification. They describe reward-based gamification as using elements of games to extrinsically motivate students, such as badges and other rewards. Meaningful gamification involves using elements of games to intrinsically motivate students by allowing them a lot of choice and the ability to be able to personalize information. Becker and Nicholson describe six elements to motivate students through meaningful gamification: reflection, exposition, choice, information, play, and engagement. These elements are described in detail in Hung (2017) below. Becker and Nicholson point out that an integral element of games is that play is optional. In order for a classroom to be truly play-based, students must have the option to opt-out. They state that some aspects of games, such as points and leaderboards, may help the very students who would have succeeded in that class without gamification. Student agency is an important factor to motivation, and students must feel that they have choice. One of the authors' key findings about gamification is the connection between reflection and being able to personalize information, including reflecting on narratives, whether created by the teacher or the student. From the case study presented, students found there to be a considerable learning curve when introduced to gamification. Best practices for meaningful gamification are listed and include: setting clear goals, providing administrative support, providing quick feedback, and using a student-centred narrative. Becker and Nicholson make the point that good design itself is able to accomplish much of what gamification strives to achieve.

Bran, L. (2017). Why we should all think about the gamification of education. Retrieved from <http://www.edtechupdate.com/elementary/gamification/?open-article-id=6041872&article-title=why-we-should-all-think-about-the-gamification-of-education&blog-domain=neolms.com&blog-title=neo-lms>

Bran states the importance of revamping our current education system. She contributes not keeping up with the modern world with increasing dropout rates. Other contributors include our time-based system where students are forced to move on after a certain period of time, regardless of their progress, as well as standardization. Bran lists several benefits of gamification in both face to face and online environments including improved attitude, increased motivation, and a willingness to fail. Bran states that more choice and control are given in gamified environments, which allows students to find and explore their passions. She states that

students should be able to specialize based on their passions at an earlier age, versus learning all subjects in each grade.

**Brown, S. (2009). *Play is more than just fun*. Retrieved from [https://www.ted.com/talks/stuart\\_brown\\_says\\_play\\_is\\_more\\_than\\_fun\\_it\\_s\\_vital](https://www.ted.com/talks/stuart_brown_says_play_is_more_than_fun_it_s_vital)**

Dr. Stuart Brown is the founder of The National Institute for Play. In his Ted Talk he describes the importance of play and how it is connected to human development and intelligence. Brown states that we have lost the importance of play in our culture. In relation to education or other areas where play is being used, he states that if there is an element to the activity that is more important than the play itself, then the activity probably isn't true play. He describes several types of play important to human development and intelligence, including rough and tumble play for preschoolers in order for them to learn emotional regulation and develop cognitively, socially and physically. He describes the importance of social play in order to feel as though one belongs. He also describes object play, specifically with the hands, and how object play with the hands as a young child is a predictor of how well adults can solve problems. Brown makes the connection between play and human survival through an example of rats that were play deprived versus rats not play deprived. Both groups of rats were exposed to the scent of a cat, and both groups immediately fled and hid. The difference between the two groups is that the rats who experienced play eventually came back out, whereas the rats who were play deprived never came out and did not survive.

**Buckley, P. & Doyle, E. (2016). *Gamification and student motivation*. *Interactive Learning Environments*, 24, 1162-1175. doi: 10.1080/10494820.2014.964263**

Buckley and Doyle concluded that gamification has a positive impact on student engagement and learning in an online setting, but that the degree of impact was dependent on how a student is motivated. Distinguishing characteristics of gamified learning are outlined, including rewards, clear goals, instant feedback and that "rules structure the learning activity, placing clear limits on the actions a learner can take". Buckley and Doyle point out that playing games normalizes failure and promotes revision and mastery. They state that the competitive element to games motivates students and explains the effort and time students can focus on tasks. Intrinsic and extrinsic motivation are described and categorized in detail, with intrinsic motivation being compared to Piaget's cognitive behavioural theories, and extrinsic motivation being compared to B.F. Skinner's behavioural theories. Students took part in a gamified learning activity about the national tax system in Ireland. Data was collected on how individual students are motivated and pre- and post-gamification surveys were completed. It should be noted there was no control group in their study. Results showed that gamification had the most impact on students who are intrinsically motivated, specifically those that are intrinsically motivated to know, or intrinsically motivated towards stimulation. Of students who are extrinsically motivated, the study was not able to conclusively prove their hypothesis that gamification would improve learning, with the exception of those students who are extrinsically motivated by identification. It is noted that this is the type of extrinsic motivation is most like intrinsic motivation.

**Chou, C.C., & He, S. (2016). The effectiveness of digital badges on student online contributions. *Journal of Educational Computing Research*, 54, 1092-1116. doi: 10.1177/0735633116649374**

This study implemented a badge system to reward both participation and interaction in online and face to face teacher education graduate classes. Some of the classes were research based, while others were activity based. The study concluded that badges were an effective method to improve student interaction, but did not have an effect on student participation. The effect on interaction was shown in the face to face and online research courses that lacked previous interaction, however, in face to face and online courses that already had high levels of interaction, no improvement was shown. Whether the course delivery was face to face or online had no effect on student participation or interaction. The study collected quantitative and qualitative data. It should be noted that the data was collected from a small sample size, and included little on student perceptions. Chou and He's paper states that increased participation and interaction can improve knowledge formation and may have a positive effect on achievement. Interaction is especially important, however, they also state that simply increasing time spent on interaction does not necessarily lead to this positive effect on achievement. A badge system implemented with sound design has the ability to balance the rates of interaction, for both students who interact too frequently and not frequently enough. Badges can also promote collaboration, however, there is such a thing as too many badges when looking at their effect on motivation.

**Dubbels, B. (2016). Pedagogy and play: Creating a playful curriculum for academic achievement and engaged learning. In K. Schrier (Ed), *Learning, Education and Games Volume Two: Bringing Games into Educational Contexts* (section 4). Retrieved from [https://oltd508lewis.weebly.com/uploads/8/2/7/9/8279059/learning-education-games-2\\_schrier-et-al-web.pdf](https://oltd508lewis.weebly.com/uploads/8/2/7/9/8279059/learning-education-games-2_schrier-et-al-web.pdf)**

Dubbels presents three case studies to present his framework for promoting play in the classroom. His framework includes positive teacher disposition, process-orientation, and choices in assessment and content. Dubbels states that using a playful approach results in less behaviour management, greater trust, improved recall and comprehension, and an "increased likelihood of unique innovative solutions to problems." Dubbels blames politicians and corporate interests in the US for taking the play out of schools and replacing it with standardized content, delivery, and tests. He states that as a result of "play deprivation", many students have developed a fixed mindset where they will avoid challenges as a result of a fear of failure. Play results in a growth mindset as a result of learners feeling safe and in control, there is no fear of failure. Pellegrini (1983) is cited as stating that students engaged in play learn more. This type of playful environment resulting in a growth mindset, combined with positive communication, is referred to as Positive Teacher Disposition. Process orientation refers to designing play-based activities that allow for differentiation where everyone is able to start playing, and everyone is able to reach their potential. It also allows for student exploration and discovery, and offers students the opportunity to make sense of information and create their own work. Informative assessment promotes play by allowing assessment to occur "within the flow of learning" and involves students in the decision making process. Play encourages mastery-based learning,

which contributes to reducing the fear of failure. Dubbels points out that in order to implement play-based mastery-based learning, we need to re-think assessment.

**Furdu, I., Tomozei, C. & Köse, U. (2017). Pros and cons gamification and gaming in classroom. *Brain: Broad Research in Artificial Intelligence and Neuroscience*, 8. Retrieved from <https://doaj.org/article/4682bbd4c5834b9198145dea0978ce67>**

This study looked at the effects of a leaderboard on student motivation. This was the only aspect of gamification that was introduced to students, and it was found to decrease student motivation. A possible reason for this decreased motivation was that the top 4 students in class had far surpassed the progress of their peers and that seeing this decreased motivation for the other students. It was not stated how students were evaluated in this course, except to say that students were required to pass all quizzes and lessons. Benefits to gamification are listed and include: a better learning experience by allowing for fun, instant feedback, personalized learning environment, and flexibility to meet most learning needs. Disadvantages to gamification are listed and include: “seeming trivial and boring” without excellent design, motivating students extrinsically, and the inability to reward effort when the focus of gamification is mastery.

**Heick, T. (2011). The gamification of education: What school can learn from video games. Retrieved from <https://www.edutopia.org/blog/gamification-education-terrell-heick>**

Heick describes the evolution of video games from lacking “authentic social interaction” to having the ability to communicate between games to promoting social interaction through the invention of the internet. Rewards such as trophies in games have provided frequent, immediate gratification, and the ability to share these on social media has resulted in an addiction to the recognition they bring. For many, the main goal is no longer to beat the game, but to improve social status by obtaining and sharing more trophies. Avatars have personalized the experience and allowed the “consumer” to become a “creator”. Heick states that this type of gamification in schools has the ability to allow students to take an infinite number of ways to reach common goals, and results in learning being transparent to all parties involved. Gamification creates connections, and promotes analysis, metacognition, as well as reflection and revision.

**Hung, A.C.Y. (2017). A critique and defense of gamification. *Journal of Interactive Online Learning*, 15. Retrieved from <http://www.ncolr.org/jiol/issues/pdf/15.1.4.pdf>**

This article outlines best practices for designing meaningful, student-centred gamified environments. Hung points out that a review of previous literature shows that gamification has improved attendance, participation, and motivation, but that no data has been collected that shows any improvement in learning as a result of gamification. It is noted that data isn't easily interpreted as every gamified environment is designed differently. The author cites Nicholson's (2015) six elements of meaningful gamification: play, exposition, choice, information, engagement, and reflection. By allowing play, learners are not penalized for failure, they are able to progress based on their personal interests, and are not motivated by external rewards. The exposition element states that learners should choose their own challenges, goals, and narrative. By allowing learners to choose their own narrative, they are better able to relate to and make sense of the information learned. Gamification allows for choice in how, when and

what students learn, as well as what form their end product is in. Badges may be useful checkpoints, but they are not the end goal. Information should be provided to students frequently in several ways, including graphics, to help them understand how they achieved a badge or reward, and how it helps them achieve mastery. Engagement may be with others, in the form of leaderboards or competitions, or with the system itself by choosing difficulty level. Reflection should happen throughout the course to allow students to make sense of what they learned and how they can apply it elsewhere. Part of reflection may be communicating with peers.

**Lee, J.L. & Hammer, J. (2011). Gamification in education: What, how, why bother? *Academic Exchange Quarterly*, 15. Retrieved from [https://www.researchgate.net/publication/258697764\\_Gamification\\_in\\_Education\\_What\\_How\\_Why\\_Bother](https://www.researchgate.net/publication/258697764_Gamification_in_Education_What_How_Why_Bother)**

The authors of this article state that gamification needs to be implemented from a sound design standpoint, and out of a need to address a problem. Implementing gamification because it's the next fad is not justified. The authors point out that schools themselves are one big gamification environment, and that simply adding game elements to your classroom does not necessarily equate to increased motivation or engagement. Rock (2004) is cited as stating that "disengagement from school happens at the social and emotional levels, problems exacerbated by the formal rules of school." If implemented and designed well, gamification has the ability to allow students to experiment with and have some control over rules, emotions, and social roles. Lee and Hammer state that gamification allows for mastery-based learning through the normalization and acceptance of failure, and through providing students with appropriately challenging tasks. They state that gamification gives students clear goals to work towards, with multiple paths available to get there. One element of games that Lee and Hammer discuss is that game play should always be optional in order for it to be true game play. By making game play mandatory, teachers run the risk of some students becoming disengaged.

**Lucardie, D. (2014). The impact of fun and enjoyment on adult's learning. *Procedia - Social and Behavioral Sciences*, 142. Retrieved from [https://ac.els-cdn.com/S1877042814046242/1-s2.0-S1877042814046242-main.pdf?\\_tid=60d76297-7e16-4251-a7ce-cc1083440941&acdnat=1524248161\\_68a37adaf437e31610ebf65393feb014](https://ac.els-cdn.com/S1877042814046242/1-s2.0-S1877042814046242-main.pdf?_tid=60d76297-7e16-4251-a7ce-cc1083440941&acdnat=1524248161_68a37adaf437e31610ebf65393feb014)**

This study concluded that there is a direct correlation between fun and achievement in adult learning. Students and teachers were interviewed to obtain data and it was reported that both fun and enjoyment had a positive effect on motivation, knowledge, skill development, and concentration, as well as social connections. It should be noted that students chose to participate in this study, and were not selected randomly. Lucardie points out that research has shown the connection between fun and learning for both children and older adults, but that research was missing for adults. Light (2002) is cited and states "creativity in children is thought to be stimulated by fun and humour, when the brain is more relaxed and is less bound by rules." Hromek and Roffey (2009) are cited and state "there is a natural affiliation between child, play and the desire to have fun, which makes games an ideal vehicle for teaching." Lucardie's goal

was to fill this gap in literature. Lucardie points out that fun is often perceived as being not worthwhile, or frivolous entertainment, however, fun can be challenging. Challenge, along with the perception of importance, are key factors to student motivation.

**Lynch, M. (2017). How does gamification affect the learning process? Retrieved from <http://www.theedadvocate.org/how-does-gamification-affect-the-learning-process/>**

This article outlines how gamification can facilitate learning. Applying elements of games can facilitate the movement of information from short to long term memory if gamified lessons include audio and visual delivery, and information is presented in small and organized chunks. Immediate feedback and rewards such as badges keep students going. As well, the social aspect improves brain function and helps with engagement. Playing games is fun which releases dopamine and results in positive feelings towards the course content and learning in general.

**Oxford Analytica. (2016). *Gamification and the future of education*. Retrieved from <https://www.worldgovernmentsummit.org/api/publications/document?id=2b0d6ac4-e97c-6578-b2f8-ff0000a7ddb6>**

This report looks at the history of gamification, how it has been used, its advantages and drawbacks, and how it can be implemented successfully in order to determine its role in the future of education. The report concludes that gamification should be implemented one aspect at a time, with opportunity for feedback and revision before implementing the next aspect. It states it should be implemented deliberately with the focus on applying underlying principles of gamification to existing curriculum, and not the visible elements of gamification. Freedom to fail, freedom to experiment, freedom of effort and freedom to self-express are listed as major benefits of gamification. It is noted that these are the very things that make games in general so enjoyable. This report states that since these freedoms mimic those of individualized programs, gamification may be especially well suited to students with special needs. Best practices listed include incorporating game-based learning and role-playing, using intermittent reward patterns, reducing distractions, creating mixed skill level groups, individual assessment, and appropriate group work conditions. Resistance from parents, lack of interest, poor implementation, access to technology, and financial constraints are listed as barriers to gamification. Distracting attention, social tension, and extrinsic rewards are listed as drawback to gamification. This report classifies game elements into three categories: mechanical, personal, and emotional. Mechanical elements include incremental progression, badges, onboarding and accessibility, and instant feedback. Personal elements include visible status such as avatars and profiles, collective responsibility, and leaderboards or ranking. Emotional elements bring students into flow by providing a clear goal, immediate feedback, and appropriate challenges. The report states that although gamification is possible without it, technology has improved our ability to gamify education. This report highlights several case studies, including fully gamified schools that begin all design by identifying what professions would use specific knowledge and designing activities that allow students to act as a member of that profession.

**Pappas, C. (2014). *The science and the benefits of gamification in elearning*. Retrieved from <https://elearningindustry.com/science-benefits-gamification-elearning>**

This article outlines the bodies response to receiving rewards through participating in gamification in an online environment. As a result of receiving a reward, neurotransmitters are released that give learners a sense of fun, as well as a sense of calm and well-being. By providing clear goals, gamification increases attention and motivates students. Rewards results in students becoming active learners and as a result of the information being associated with a favourable activity, they are better able to retain the information. Interactive game elements can result in students feeling more involved in the learning process. Applying content to real-world scenarios also improves retention. Lastly, the opportunity to repeatedly fail without risk allows students to explore topics in much greater detail compared to a non gamified environment.

**Rimland, E. & Raish, V. (2017). *Design principles for digital badges used in libraries*. *Journal of Electronic Resources Librarianship*, 29, 211-220. doi: 10.1080/1941126X.2017.1378540**

Although this article focuses on the use of digital badges in the library, the information could be applied to any subject. The article lists best practices for designing instruction in an online setting that culminates with awarding a digital badge. For the badge itself, the title and image should indicate what skill was learned, and it should be clear who issued the badge. How much time will be needed to give sufficient feedback and how instructors can provide feedback should be considered. This article states that badge platforms that allow for feedback to be provided within the platform is easier. To motivate students, skills being learned should be relevant, timely and viewed as necessary by learners. Being able to display badges publicly may motivate those that are motivated extrinsically. Providing a hierarchy or “level-up” system of available badges for the same learning outcome allows for differentiation, and may also motivate those that are motivated intrinsically. Current learning theories need to be considered before determining learning outcomes. Once outcomes are determined, an instructional design model should be chosen that is appropriate to the learning outcomes.

**Kim, S., Song, K., Lockee, B. & Burton, J. (2017). *Students’ perception of gamification in learning and education*. In *Gamification in Learning and Education: Enjoy Learning Like Gaming* (chapter 6). Retrieved from <https://ebookcentral.proquest.com/lib/viu/reader.action?docID=5050561&ppg=59>**

This chapters explains that different students are motivated by different types of experiences in game environments. Types of experiences include captivation, challenge, competitions, fantasies, nurture, relaxation, and simulation. There are gender differences to preferred game environment experiences, and these should be considered before implementing gamification in the classroom. Within a gamified environment, there are different types of gamers, or different roles that students can take on or be assigned. Each student has their preferred gamer or gamers. Some of these roles, such as griefers and rule breakers, may be harder to manage and technology such as apps to monitor student interactions can be useful in this situation.

**Kim, S., Song, K., Lockee, B. & Burton, J. (2017). Theories for gamification in learning and education. In *Gamification in Learning and Education: Enjoy Learning Like Gaming* (chapter 5). Retrieved from**

**<https://ebookcentral.proquest.com/lib/viu/reader.action?docID=5050561&ppg=50>**

Theories that are applicable to gamification in education are explored in this chapter. The authors describe Motivation Theory, Self-Determination Theory, Achievement Goal Theory, Social Learning Theory, Situated Learning Theory, and Feedback. Motivation Theory states that students may be extrinsically or intrinsically motivated, and how they are motivated may change depending on what they're learning, what their goals are, or the context. Because students may be intrinsically or extrinsically motivated for a specific task, extrinsic motivation should be used when necessary. The Self-Determination Theory states that autonomy, competence, and relatedness result in growth. The proper use of intrinsic and extrinsic motivation is important. Choice, as well as not giving direct answers, can lead to autonomy. Positive feedback, as well as appropriately challenging tasks that lead to flow result in perceived competence. Both competence and relatedness result in intrinsic motivation. Relatedness can arise from teachers, peers, or parents. The Achievement Goal Theory describes two types of goals: mastery goals that focus on learning for oneself, and performance goals that focus on achieving higher results than others. Students may switch between mastery and performance goals, depending on the task and timing. Both types of goals can have a positive effect on achievement, however, only mastery goals have a positive effect on self-efficacy, and self-regulation. Social Learning Theory involves social interaction and cognitive processing as a result of watching others perform tasks and then being motivated to mimic those tasks. Situated Learning Theory states that learning cannot be separated from real-life context. Students need to form knowledge in real-life situations that include social interaction and collaboration. The authors point out that different types of feedback is beneficial to different students and at different times. Positive feedback should be used primarily with beginner learners, whereas negative feedback may be effective at motivating experts.

**Shields, R. & Chugh, R. (2016). Digital badges - rewards for learning? *Education and Information Technologies*, 22, 1817-1824. doi: 10.1007/s10639-016-9521-x**

This article concludes that digital badges can increase motivation and engagement in an online course, however, their methods have not been tested. The authors assessed the potential impact of digital badges on a non-academic online course given to high school students that tested essential skills that universities felt high school graduates should have. Shields and Chugh stated that digital badges are superior to physical badges because they are able to house information about the badge, are transparent, and can be verified. They also point out that badges can be used for skills that aren't easily portrayed in a typical degree or paper certificate, such as problem solving. It was concluded that badges should not be used as a sole motivator, but used together with effective course design and learning theories. Shields and Chugh cite Lin et al. (2003) who concluded that low levels of extrinsic motivators would not affect a student's performance as long as it was in conjunction with high levels of intrinsic motivation. The article lists several things to consider before implementing digital badges in this online course, including using badges to allow for mastery-based learning.



**Utecht, J. (2018, March 21). It's all about the badges. *Shifting Our Schools Podcast*. Podcast retrieved from <http://sospodcast.org/episode43/>**

In this podcast, Jeff Utecht speaks with Doug Belshaw about digital badges and what role they will play in the future of education. Belshaw states that badges are most important in times of transition, when learners are wanting to use their badges to demonstrate their knowledge or skills. Learners can use tools such as Badgr or Credly to build their “backpack” of badges to build a digital resume. Because of this, Belshaw states that it is important that badges have a defined value, determined by the evidence attached to the badge. This evidence could take the form of text, picture, video or links. Belshaw describes how “open badges” have standards for including verified evidence to ensure credibility of the badge. He describes how badges can be recognized or endorsed by other badge issuers in order to add value to that specific badge. This podcast describes badges as “in between a degree and a blog”. It describes the trend towards no longer obtaining a 4-year degree from a single institution but instead earning badges from several institutions to earn a “portfolio degree”. Schools can benefit from this in that it eliminates the need for every school to offer every course. Instead, they can focus on improving ones that are unique to them. Belshaw lists several problems with this, including the need to determine which badges are required for specific credentials or jobs.

**Willis, J. (2007). The neuroscience of joyful education. *Educational Leadership*, 64.**

**Retrieved from**

**<https://www.psychologytoday.com/files/attachments/4141/the-neuroscience-joyful-education-judy-willis-md.pdf>**

Willis looks to brain research to support best practices in teaching. She notes how standardized testing has moved classrooms away from play at the detriment to students. Willis states that learning is improved when students experience less stress and a more positive environment. As a result of reduced stress, students are better able to understand and personalize information, make connections, and transfer information from short term to long term memory. Enjoyable classroom activities release dopamine, which improves attention and increases retention. Willis points out that something as simple as not understanding why they are learning something can cause stress in students and affect learning. Willis lists several ways to reduce stress in students including giving them breaks, creating positive connections with material, personalizing material, teaching students how to prioritize information, and allowing students choice and the opportunity to discover information on their own.