Chapter 2

Gamification

Examples, Definitions, and Related Concepts

Gamification and games share many characteristics. Just like games, gamification provides us with a fun activity to do, has rules to follow, and can require various levels of technology, from none to simple or advanced. It can also be seen as a trivial pursuit; it may serve many different purposes for different individuals in different contexts, from destressing to excitement;[1] and it can be addictive sometimes, just like games. However, there are some important differences between games and gamification. We will review a number of examples of gamification in this chapter and see if we can identify those elements that differentiate gamification from games.

Making Recycling Fun with the Bottle Bank Arcade Machine

The Bottle Bank Arcade machine is a green recycling box that collects used glass bottles. It has six holes for bottles, and each hole has a blinking light flickering in bright colors on top. It is fitted with a display panel, which records the scores. The Bottle Bank Arcade machine invites people to not only simply deposit bottles but also to play an old-fashioned arcade game with those bottles. Once people press the Start button, one out of six lights lights up, thereby indicating where one should insert a bottle. If you put in a bottle in time, you score points. The video on the Fun Theory website shows people stopping, intrigued by sound and lights; depositing glass bottles with smiles on their faces; and even a kid jumping up and down in excitement. The Bottle Bank Arcade machine was designed to encourage more people to recycle bottles by making it fun. According to the result mentioned in the video, it certainly seems to achieve its goal. Almost a hundred people used it in just one evening while the nearby conventional recycle bottle bank was used only twice.[2] The Bottle Bank Arcade machine received the Fun Theory Award, which is an initiative by Volkswagen. According to the award website, "the fun theory" means that fun is the easiest way to change people's behavior for the better, and the award is given to an idea or an invention that helps prove the fun theory.[3] This is an interesting way to state the concept of gamification.

The Fun Theory
www.thefuntheory.com

The Speed Camera Lottery, the World's Deepest Bin, the Play Belt, and the Piano Stairs

Other winners of the Fun Theory Award include the Speed Camera Lottery, the World's Deepest Bin, the Play Belt, and the Piano Stairs. The Speed Camera Lottery machine photographs those who are driving both within and above the speed limit. Law-abiding citizens are automatically entered into a lottery, while those who break the law are issued citations. The best part is that the cash reward for the lottery winners is funded by the fines paid by those who broke the law. The video on the Fun Theory website reports that during the three-day trial period, 24,857 cars passed the Speed Camera Lottery machine. The average driving speed went down from 32 kilometers per hour

Figure. 2.1
The screen images of a gamified to-do app, EpicWin. My tasks are listed as quests with certain points, which takes me farther along in my avatar's travel and lets me find and collect items.

to 25 kilometers per hour, a 22 percent reduction.[4] The World's Deepest Bin was designed to produce sound whenever someone dropped garbage into it, as if something very heavy had been thrown into a tremendously deep valley, thereby encouraging people to use a garbage bin instead of littering.[5] The Play Belt is a safety belt that turns on the in-car entertainment system mounted on the back of the front seats when the belt is in use. The belt is a way to reward the use of a safety belt by making the in-car entertainment system available.[6] The Piano Stairs are stairs made to look like a piano keyboard and engineered to make the sound of each piano key when people step on different steps.[7]

As you can imagine, the video of the World's Deepest Bin in use shows people trying to peer inside the bin itself with a curious look on their faces. It succeeded in collecting almost double the amount of garbage compared to an ordinary waste bin. The Piano Stairs, installed right next to an escalator, effectively changed people's behavior, increasing the use of the staircase by 66 percent. Both videos can be viewed at the Fun Theory website.

Get Things Done with EpicWin and Chore Wars

The Bottle Bank Arcade machine, the Speed Camera Lottery, the World's Deepest Bin, the Play Belt, and the Piano Stairs demonstrate that by adding a bit of fun to everyday activity, people can be persuaded to act in a more socially responsible, safer, and healthier way. If fun can change people's behavior, could it help people get everyday tasks done on time that are often put off until the last moment?

EpicWin is a gamified to-do list app dressed up with a RPG (role-playing game) setting. It allows one to create to-do list items and assign points that will be earned when the task is completed (figure 2.1). Those points can fall under any of the five categories: strength, stamina, intellect, social, and spirit. EpicWin invites people to see themselves as a character on a quest for various treasures and encourages them to complete their everyday tasks. With its nice visual design and fun sound, EpicWin throws a layer of lightweight fantasy over a to-do list that is often boring and dull to look at.

EpicWin
www.rexbox.co.uk/epicwin

Chore Wars is a computer game that allows players to claim experience points for doing household chores. As members of a household or a workplace, people can earn experience points by performing individual tasks and chores, which are called "quests," and level up. Experience points can be used to develop one's character or exchanged for gold, treasure, or equipment, which can be further redeemed for a real-world reward, depending on the decision of a group.

Chore Wars
www.chorewars.com

Staying in Budget and Saving Money with Gamified Banking

If gamification can get people to tackle their chores and tasks, could it also similarly influence their spending and saving behavior? Simple applies a gamification strategy to help people understand their personal finances better and manage them more wisely. Users can download its mobile app for the iOS and the Android platform. Instead of showing the amount of money available in your account, the Simple bank app shows the effective balance in your bank, taking into account and deducting recurring bills such as rent or mortgage, utilities, and so on. It also makes you plan your purchases ahead and set them up as goals with saving plans. If you want to buy a fancy espresso machine, the Simple bank app lets you set into a game a specific goal that has an emotional meaning to you—delicious espresso every morning—with a certain due date for saving the five hundred dollars for that purchase. According to the experience of a user of this app, running all savings via goals can change one's whole attitude toward saving and make one view savings as an anticipatory pleasure rather than denying oneself.[8] While Simple is a very lightweight game, with a simple setup for goals and rules and no other game elements, such as points or levels, it certainly seems to have the potential for solving the overspending problem that many of us experience.

Simple
https://www.simple.com

Promoting Fuel Efficiency and Energy Savings through Gamification

An automobile company, Nissan, gamifies driving with its Carwings program. Carwings is a mobile app for smartphones designed for the owners of the Nissan Leaf. It allows owners to compare their driving performance to other local drivers, see their status in a regional rankings dashboard, and earn bronze, silver, and gold medals and a fancy platinum award, thereby encouraging them to drive in a more fuel-efficient manner.[9]

Carwings
www.nissanusa.com/innovations/carwings.article.html

In 2012, San Diego Gas and Electric (SDG&E) gamified energy-saving activities. For three months, approximately two hundred people played a social gaming app, which provided them with real-time information about their energy savings integrated with a control device at home. Those who participated in this energy-saving contest competed with one another and earned points and badges by increasing their energy savings.[10] The result was quite successful. The winner of the SDG&E's Biggest Energy Saver Contest achieved as much as 46.5 percent energy savings, equal to 1,356 kilowatt hours for her family of three, and those who used the same energy-saving gamification app achieved 20 percent savings on average, compared to 9 percent by those who used only the device without the gamification app.[11]

Making Exercise Fun and Social

Gamification proves to be quite popular in the area of fitness as well. Zombies, Run is a mobile running app, which sets you up as a hero in the middle of a zombie apocalypse. It asks you to run at a certain speed and with certain intensity in order to survive zombie attacks, avoid zombie hordes, and collect supplies along the route. While you are running, the app tells you more and more details of the story about the zombie apocalypse, which becomes the backdrop of your running exercise. When the Zombie Chase mode is turned on, users are basically asked to perform interval training. When you finish the run and are back home, you can release the supplies you collected to particular bases, so that those bases can grow and expand to fight more zombies. This also lets you gain access to other running missions and adventures in the app. Users can also view the report of their running speeds and distance and share it with friends on social media. Zombies, Run has currently over eight hundred thousand users according to its website.[12]

Zombies, Run
https://www.zombiesrungame.com

Nike+ is another gamification running app. Launched in 2007, it has approximately eighteen million users worldwide.[13] Nike+ allows people to track, share, challenge, and interact with friends and other runners across the world, thereby making running, usually a solitary activity, into one that is socially exciting and even collaborative. One can set up goals and challenges for oneself or a group, earn trophies and badges by achieving those goals or meeting the challenges, and move up to higher levels. For example, one receives the Jack O Lantern Badge by running on Halloween and earns the Platinum High Mile Trophy by running over a hundred miles in a month.

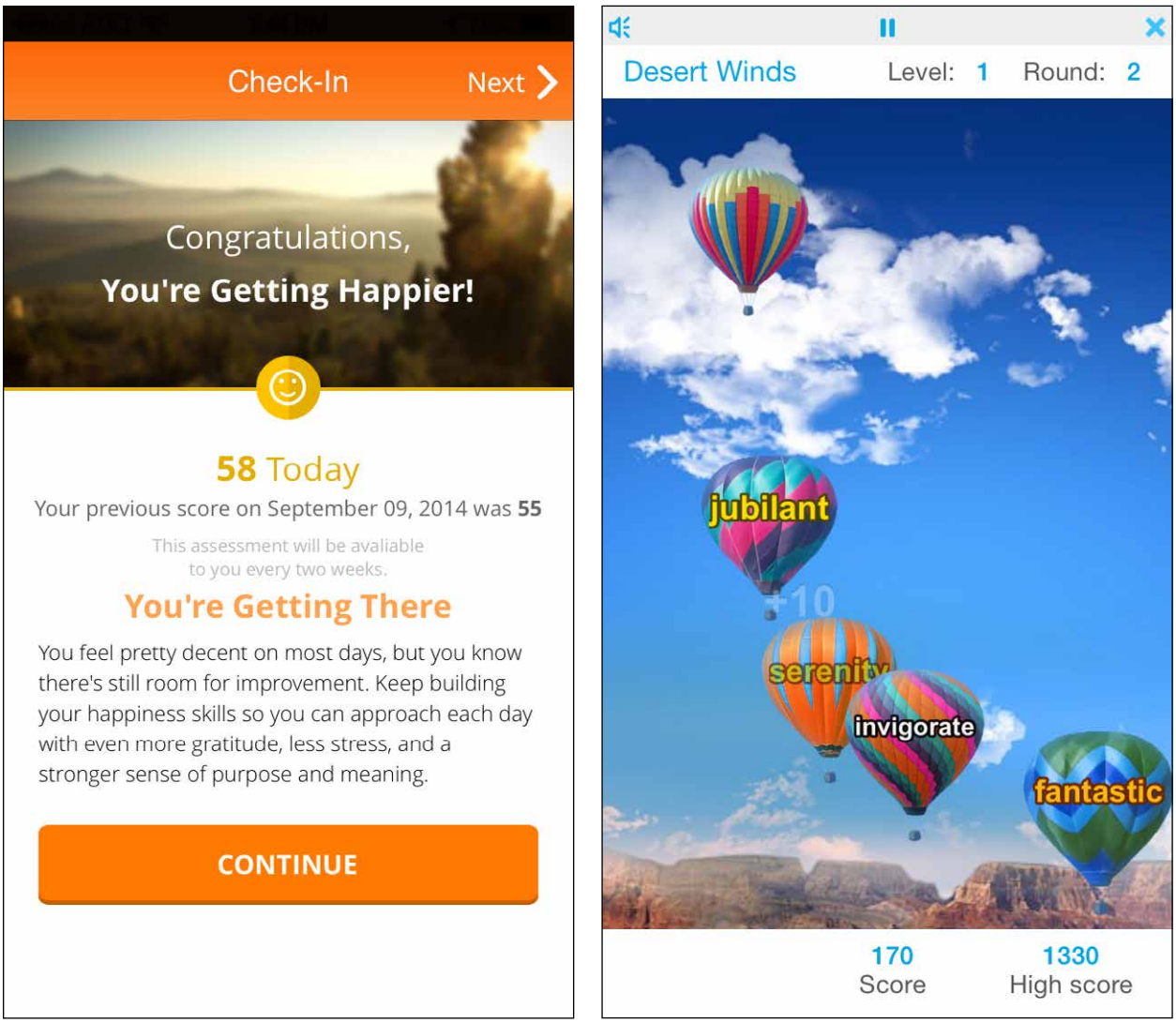

Figure 2.2
The screen images of a gamified happiness app, Happify, showing the happiness points and feedback and one of the game-like activities in the app.

Sometimes, surprise prizes are delivered electronically to players when they complete challenges. These include videos of praise from celebrity athletes and other potential heroes.[14]

Nike+
www.nike.com/us/en_us/c/running/nikeplus/gps-app

Maintaining Relationships and Happiness through Gamification

Gamification apps such as Kahnoodle and Happify try to apply gamification even to areas of relationship and happiness. Kahnoodle debuted in 2013 as the first gamification app for a couple's relationship. In this app, partners are encouraged to fill the so-called Love Tank by taking considerate actions, giving presents, and doing activities together, thereby earning points and getting rewards in the form of a coupon redeemable in reality by his or her partner. Although it received a lot of attention as the first gamification app for relationships, Kahnoodle seems to no longer exist.

Another gamification mobile app, Happify, applies gamification strategies to happiness and wellness (figure 2.2). It claims that it can increase users' happiness with fun activities and games, help people learn life-changing habits based on science, and reduce stress. It presents several questions for you to answer about how you feel about your current life and assigns you

a certain Happiness Score. After that, it asks you to choose a track to work on such as Conquer Your Negative Thoughts. Each track asks you to perform tasks that are game-like, such as popping air balloons with positive words only. By playing these games and other game-like activities you earn points and medals and get to move on to other tracks with different activities. As you advance, Happify regularly asks you the same questions that it asked in the past and informs you if the score went up or down. While creating happiness through gamification may appear to be a dubious idea, reviews by actual users in the Apple App Store are positive.

Happify
www.happify.com

Apple App Store: Happify
https://itunes.apple.com/us/app/happify/id730601963?mt=8

Now that we have seen a number of examples of gamification, it's finally time to think about what these examples have in common. They all appear to share some game elements, which range from challenge, points, levels, badges, and trophies to competition. Not all but some of them also have a social element such as statuses and leaderboards. All of them attempt to transform a mundane activity into something a little more exciting and fun.

The Definition of Gamification and Related Concepts: Game, Playful Design, and Toys

Zichermann and Cunningham define the concept of gamification as follows.

> Gamification is the process of game-thinking and game mechanics *to engage users and solve problems*.[15] (Emphasis added)

This definition focuses on the purpose of gamification and emphasizes its goal, that is, user engagement and problem solving. This definition seems to explain many of the examples of gamification we have seen. Nike+ engages people in their running activities and solves the problem of not exercising enough. Chore Wars motivates people to get their chores done, thereby solving the problem of people neglecting to do or putting off their chores. The Piano Stairs motivates people to stay fit by taking the stairs rather than the elevator. The World's Largest Bin helps people to keep streets clean and litter-free. As a result of gamification, people are engaged and specific problems are solved.

However, this definition does not seem to help us much in distinguishing gamification from games, particularly the game genre called "alternate reality game" (ARG). What differentiates an ARG from other types of video game is that ARG players make their moves in the real world, not in front of a computer or a video game console screen, and interact directly with other players (i.e., characters) in the game. An ARG uses the Internet as well as other forms of communication, such as mail and phone. For example, Zombies, Run seems to meet most of the conditions for an ARG, even though it doesn't necessarily make players directly interact with one another. So what makes Zombies, Run gamification, not an ARG? To answer this question, let's consider another widely accepted definition of gamification by Deterding, Dixon, Khaled, and Nacke.

> Gamification is the use of game design elements characteristic for games *in non-game contexts*, which is differentiated from playful design and a full-fledged game.[16] (Emphasis added)

By specifying the context to which game design elements are applied, this definition makes a clearer distinction between games (including ARGs) and gamification. The nature of the problem that gamification tries to solve is not fictional but real. In order for something to count as gamification rather than a game, its goal must be solving a real-world problem. Deterding et al. also differentiate the game from "play" relying on Caillois's concept of *paidia* ("playing"), a more free-form, expressive, improvisational, even "tumultuous" recombination of behaviors and meanings versus *ludus* ("gaming"), playing structured by rules and competitive strife toward goals.[17] They find the main characteristic of gaming in explicit rule systems and the competition or strife of actors in those systems towards discrete goals or outcomes and conclude that gamification relates to games, not "play," which lacks those characteristics.[18] Deterding et al. show how gamification is situated in comparison to games, toys, and playful design using a quadrant diagram. The horizontal axis runs from Whole (left) to Parts (right) and the vertical axis runs from Playing (down) to Gaming (up). They place gamification (or "gameful design/gamification") in the top right quadrant between Gaming and Parts. By contrast, games (or serious games used for educational purposes) are in the top left quadrant between Gaming and Whole; toys are in the bottom left quadrant between Playing and Whole; and playful design is in the bottom right quadrant between Playing and Parts.[19]

This distinction is useful in clarifying borderline cases such as the Piano Stairs and the World's Deepest Bin. There is certainly an element of fun in those examples, and they were intentionally designed to solve real-world problems. But they have neither

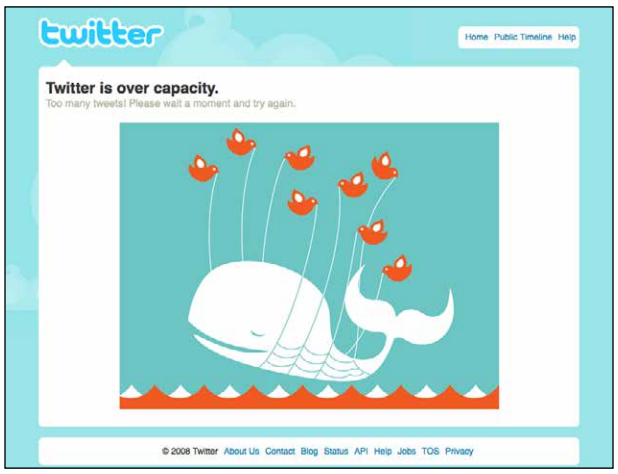

Figure. 2.3
The Fail Whale shown on a computer screen when Twitter was down. [Photo credit: "Twitter Fail Whale is back," https://www.flickr.com/photos/playerx/3090739418, by Flickr user Rob Friedman / playerx / @px, playerx.net, licensed under the Creative Commons Attribution 2.0, https://creativecommons.org/licenses/by/2.0.]

explicit rules nor competition (with others or with oneself) towards a goal, which seem to be essential parts of a game. Consequently, they are more accurately classified as examples of "playful design" than of gamification. Playful design is not 100 percent a plaything (i.e., a toy), just as gamification is not 100 percent a game. Playful design and gamification are both "part of" something that is neither a toy nor a game but serve a purpose similar to that of a toy or a game. The difference between playful design and gamification is that playful design lacks elements such as rules and a specific goal. A famous example of playful design is Twitter's Fail Whale (see figure 2.3). This playful image of a huge whale lifted into the sky from the ocean by many birds appeared in the past whenever Twitter went down and became unavailable to users due to its system overload. By using this playful design as an alternative for the common system error message, Twitter succeeded at mitigating users' frustration, and users came to even find the image of the Fail Whale itself endearing.[20]

Compared to games, gamified applications afford a more fragile and unstable "flicker" of experiences and enactments between playful, gameful, and other more instrumental-functionalist modes.[21] From the perspective of the game designer, gamified applications are built with the intention of a system that includes elements from games, not a full "game proper," but from the user's perspective, such gamified systems can then be enacted and experienced as "games proper," gameful, playful, or otherwise.[22] Marczewski also provides a helpful distinction of gamification from gameful design and serious games as well. According to him, gamification is distinguished from games in that it lacks gameplay and is different from gameful (or playful) design in that gamification possesses game elements while playful design does not.[23]

But not all game researchers agree on this distinction between playful (or gameful) design and gamification and between gamification and games. For example, Kapp defines gamification in the context of learning and instruction much more broadly as follows.

> Gamification (of learning and instruction) is the delivery of content—*for a purpose other than pure entertainment*—using game-based thinking and mechanics.[24] (Emphasis added)

Note that this definition of gamification does not require a rule-based system, unlike the one from Deterding et al. quoted above. Instead, this definition requires only a purpose other than pure entertainment as the defining characteristic of gamification. For this reason, Kapp does not distinguish gamification from playful design nor from full-fledged games as long as they serve a purpose other than pure entertainment. In Kapp's view, the creation of an educational game, which is often called "serious game," falls under the process of gamification because its primary goal is education, not pure entertainment. According to such a broad description of gamification, the Piano Stairs and a full-fledged game that teaches sales skills would both count as examples of gamification.

Whether something is played entirely for its own sake or for some external purpose is, however, a hard question to answer because people can always use one thing for both purposes. One may take the Piano Stairs for both exercise and fun at the same time. This may be why Gartner's redefinition of gamification includes the phrase "experience design." Gartner, a research company, rephrased its definition of gamification "to avoid market confusion, inflated expectations and implementation failures"[25] as follows.

> Gamification is the use of game mechanics *and experience design* to *digitally* engage and motivate people to achieve their goals.[26] (Emphasis added)

This definition is different from the previous definitions of gamification in that it separates "experience design" from game mechanics and specifies the medium of gamification as "digital." It is true that a lot of gamification takes the form of digital media. As shown in the many examples of gamification we have seen in this chapter, the mobile app seems to be a form particularly suitable for gamification. In addition, in the previous chapter I argued that the smartphone, the mobile web, and social media played a crucial role in the concept of gamification gaining popularity. Dominguez et al. go one step further and limit gamification to the domain of software application.

> Gamification could be more narrowly defined as incorporating game elements into a non-gaming *software application* to increase user experience and engagement.[27]

While there is a close relationship between gamification and software application, limiting gamification to the digital realm or software application is overly restrictive. As Deterding et al. argue, games and game design are themselves transmedial categories, and media convergence and ubiquitous computing are increasingly blurring the distinction between digital and nondigital.[28] This is a legitimate argument against restricting gamification to the digital realm only. Gamification can take the form of a paper-and-pencil game or that of a mobile app. What is important in gamification is that it does engage and help people to achieve their real-life goals using appropriate gaming elements and dynamics.

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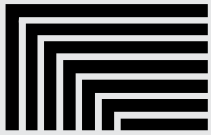

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Abstract

Gamification, which refers to applying gaming elements to a real-world activity, is not necessarily a new idea. But (1) the rapid adoption of the smartphone, (2) the tremendous growth of the mobile web, and (3) the increased use of social media have made it possible for gamification to be implemented in an unprecedentedly seamless, ubiquitous, and social manner, thereby transforming it into a portable activity interwoven with reality. This report explains the concept of gamification and how it differs from related concepts such as games, playful design, and toys; distinguishes game mechanics, dynamics, and aesthetics from one another; describes a number of gamification examples and projects in businesses, education from K-12 to higher education, and public and academic libraries; and discusses what they do, how they work, and how successful they are. This report also addresses a number of issues and variables that need to be taken into consideration when designing successful gamification for educational purposes, including the undermining effect of gamification's external rewards on intrinsic motivation.