Chapter 1
A RECIPE for Meaningful Gamification

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1.1 Introduction

Gamification is a word that has become synonymous with rewards. Most gamification systems focus on adding points, levels, leaderboards, achievements, or badges to a real-world setting in order to entice people to engage with the real world to earn these rewards. Rewards have been used for centuries to change behavior; children and pets are trained through rewards and punishments, soldiers are rewarded for achievements through ranks and badges, and schools use grades to entice students to do schoolwork.

Reward systems do work as long as the rewards keep coming, and research by Skinner has shown how to use the timing of rewards to produce a behavior after the rewards are taken away through operant conditioning (1938). Casinos and recreational game designers have used operant conditioning to addict players to continued engagement with their games without rewarding the player every time. Therefore, gamification systems have also used this model in order to engage people in real-world behavior without having to supply rewards consistently.

When the rewards stop, however, the behavior will likely stop also unless the subject has found some other reason to continue the behavior. Operant conditioning can delay the extinction of behavior by creating the mindset in the subject that "perhaps this time, I will get a reward." The reward schedule that is most effective in slowing the extinction of behavior is known as a variable ratio reward schedule, where rewards of different strengths are given out at various times (Skinner, 1938). This type of reward schedule is used by those designing slot machines and lottery tickets to manipulate players into continuing to play a game without regular rewards.

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In many life situations, having a reward structure is expected and accepted by subjects. For many, the only reason to do an unpleasant job is because of the monetary reward; if the reward stopped, then the subject would stop doing the unpleasant job. Others have found personal reasons that allow them to enjoy their jobs; if the monetary reward no longer came or was not as relevant because of their life situation, they might choose to continue this job anyway. Many tasks that are taken on every day are not done for a reward but are done for some other reason important to the subject.

The drive to do something without an external reward is known as intrinsic motivation (Deci & Ryan, 2004). Performing tasks for intrinsic reasons puts someone in a more healthy mental state than performing tasks for extrinsic rewards. Alfie Kohn, in his book *Punished by Rewards*, explores study after study that show how people perform tasks more poorly for rewards and, after receiving a reward, are less likely to do that task without the reward (1999).

The implications of this for gamification are important. Many forms of gamification are focused on providing external rewards for tasks. The designer of the gamification decides what actions are desired and assigns rewards, such as points or badges, for those actions. By doing so, the gamification system manipulates subjects to engage in a real world setting in order to earn rewards. Subjects earn points, which then lead to intangible status rewards or tangible rewards in the real world.

This system is not new; airlines and hotels have rewarded loyalty with points for decades. Customers accrue points by staying with a single airline and gain levels by doing so; these levels then correlate to perks while flying with that airline. Many businesses have adopted a tracking model offering rewards of free products, better treatment, or access to special opportunities not available to others.

Implementing a reward-based gamification system is relatively easy to do. A designer selects the behaviors to be rewarded and assigns points. These points can then be converted into levels and may also be used in a leaderboard to encourage competition between subjects. An achievement system can encourage behaviors that go outside the point structure that the designer wants to reward. Badges are ways of allowing a subject to publicly display successes and achievements within the system. This concept of adding Badges, Levels/Leaderboards, Achievements, and Points to a real-world setting is called BLAP gamification by Nicholson (2012a), and is also be referred to here as reward-based gamification.

1.2 Situations for Reward-Based Gamification

Reward-based gamification is suitable for some situations. If the organization is looking for immediate and short-term change, reward-based gamification can certainly create that. Many reward-based gamification systems create an immediate spike in engagement as users strive to explore this new system. As long as the organization is willing to continue supplying rewards, the behaviors can continue by those motivated to earn the rewards. However, if the rewards are stopped, then the

behavior can stop with it. As Zichermann and Cunningham say in their book, *Gamification by Design*, "once you start giving someone a reward, you have to keep her in that reward loop forever" (2011, p. 27).

If the goal is to teach a skill with real-world value, such as using a hammer or being toilet trained, then reward-based gamification can be effective. As the subject learns the skill, he or she is rewarded. But as the subject then masters that skill and recognizes the real-world value, the rewards are no longer needed, as the subject will continue to use the skill for the real-world benefits instead of the gamification rewards.

If there is a situation where the subject has no way of developing intrinsic motivation to perform the task, then the reward-based gamification can be valuable in helping someone engage with the task. This use of incentives to motivate someone to do something when they have no other reason to do so is a very common use of rewards and for tasks that do not require creative thinking, incentive programs can improve performance (Pink, 2011). Designers of gamification for this situation need to be aware that the participants in this type of reward cycle will expect an increase in the rewards as their performance increases, and this can be a never-ending process once begun (Zichermann & Cunninham, 2011).

1.2.1 Long-Term Change

The danger with reward-based gamification comes when the goal is to create long-term change in the subject's behavior. If the goal is to change someone for life, using rewards in the short-term can be damaging in the long-term. A key finding by Deci and Ryan in their studies of motivation is that **extrinsic rewards undermine intrinsic motivation** (2004). If rewards are used to encourage a behavior that someone already has some intrinsic motivation to engage with and those rewards are removed or no longer seen as valuable, the subject will be less likely to engage in the behavior than when he or she began.

There are many learning-based situations where this is of concern. Libraries use reward-based summer reading programs to develop a lifelong love of reading in children. Zamzee is a gamification system used to facilitate rewards for children as they exercise (http://www.zamzee.com). Rewards have been used to encourage learners to play the piano, take up dancing, or engage with other cultural activities. Grades, which are a well-established form of badges that reward learning, are so powerful that many students will refuse to engage in activities for which there is no grade assigned. The reward-based testing culture in the United States in schools has created a situation where teachers fear teaching content that is not on the test.

Reward-based systems have caused harm over the years, and reward-based gamification is another way of doing this (Kohn, 1999). BLAP gamification is very tempting to use—it is easy to implement and it has an immediate effect. The news about the short-term benefits is easy to locate while data about user dropout rates and the long-term engagement with the desired behavior is rarely discussed.

1.3 Building Intrinsic Motivation

There is another way to encourage behavior, and that is through building intrinsic motivation. Rather than providing rewards for behavior, designers can create systems that help users find their own reasons for engaging with the behavior. The theory behind how to do this is known as Self-Determination Theory by Deci and Ryan (2004). The concept behind this theory is that intrinsic motivation is a combination of three psychological needs: competence, autonomy, and relatedness.

Competence is when participants feel that they have mastered something well enough to make a difference in the world; when the participant no longer feels able to make a difference, he or she then seeks new ways to increase their competence. Autonomy is experienced when the actions and behaviors that someone engages in matches their own sense of who they are, and the extent to which someone makes his or her own decisions about behavior. Relatedness is based upon the connections that an individual feels with other people through their behaviors. Intrinsic motivation is a construct that combines these three concepts of competence, autonomy, and relatedness (2004).

Instead of using game design elements to increase external motivation through rewards, designers can use game design elements to increase intrinsic motivation. Getting a good score is just one reason that people play games; players engage with games for an exploration of narrative, to make interesting decisions, and to play with other people. There are other game design elements that are available to the gamification designer that can bring about an increase in intrinsic motivation. Using game design elements to help build intrinsic motivation and, therefore, meaning in non-game settings is known as meaningful gamification.

1.4 Meaningful Gamification

At the heart of meaningful gamification is the humanistic belief that there are some activities people engage in because they have intrinsic or internalized motivations for doing so. This ties in with Organismic Integration Theory, which states that when people act upon these internalized motivations, they will have a more positive outlook toward the activity than if they are doing something due to extrinsic motivation (Deci & Ryan, 2004). The term "meaningful" is based out of Mezirow's model of transformative learning, where learners connect an experience to previously-held beliefs, which can allow transformation of those beliefs and long-term change (Mezirow, 1991). The challenge in creating something meaningful is that the concept of what is meaningful is defined by each individual; in order for something to be meaningful, there has to be a connection to something or someone in the individual's past. A designer of a meaningful gamification system will have to provide a variety of experiences and ways of engaging to raise the chances that each participant can find something meaningful. This falls in line with the concept of Universal Design for Learning (Rose & Meyer, 2002) where learners need to have the ability to learn a concept in different ways and to demonstrate mastery of that concept in different ways. By allowing the learner choices, it raises the chance that each learner will find a meaningful connection to the material.

Nicholson (2012a) developed a theoretical framework for meaningful gamification starting with Self-Determination Theory. Key results of this framework are the recognition that no one gamification system will benefit every user, that users need to be empowered to create within the gamification system, and that systems need to provide users with the ability to learn and to demonstrate mastery in different ways. Another key result is that the system needs to be built with the user's benefits at the center; by benefitting the user first and the organization second, the chances of long-term change through building intrinsic motivation are greatly improved.

In order to develop strategies for meaningful gamification, Nicholson (2012b) explored concepts behind play and participatory museums. Key elements that arose from this exploration included the fact that play is, by definition, optional. If gamification is to use concepts of play, then the player needs to have the choice to engage with the system on his or her own terms. In order to provide participants with the information needed to make decisions with the system, the concept of creating a ludic learning space (akin to a science museum) is useful. By thinking about the gamification space as a three-dimensional real-world space instead of a linear reward-based system, designers can create gamified worlds for participants to explore.

1.4.1 The RECIPE for Meaningful Gamification

To operationalize these concepts, six elements inspired by game design will now be explored more in-depth:

- Play—facilitating the freedom to explore and fail within boundaries.
- Exposition—creating stories for participants that are integrated with the real-world setting and allowing them to create their own.
- Choice—developing systems that put the power in the hands of the participants.
- Information—using game design and game display concepts to allow participants to learn more about the real-world context.
- Engagement—encouraging participants to discover and learn from others interested in the real-world setting.
- Reflection—assisting participants in finding other interests and past experiences that can deepen engagement and learning.

When reordered, these six elements form the mnemonic RECIPE, and thus this is a RECIPE for meaningful gamification. The six elements will now be presented with a brief theoretical background, how they can be applied to gamification, and a few examples of how they have been used.

1.4.1.1 Play

Over the years, many theorists have explored the concepts surrounding play and its role in society. While there is no one accepted definition of what play is, Gordon (2009) explored different approaches to defining play in an attempt to build a

framework that connects these different approaches. One common factor inspired by Huizinga is that play is something that people engage with outside of the real world (1955). Ironically, another key play theorist, Sutton-Smith (1997), argues that play is critical to preparing organisms to deal with the variability in the real world; therefore, playing creates opportunities for evolution. In order to do this, play has to be an activity that someone chooses to engage with and the space for play has to provide freedom for exploration (Callois, 2001). Gordon (2009) explores the importance of the concept of a boundary in play and centers the idea of play on the voluntary interaction with and crossing of boundaries.

When thinking about "playification," it is valuable to think about the difference between play and games. One definition of games is that "a game is a form of play with goals and structure" (Maroney, 2001, para. 2). Since gamification is about taking game elements and applying them to a real-world setting, and one of the elements of a game is the play element, then play-based gamification is a valid approach. By flipping the above definition around, one can assert that play is a game with neither goals nor structure. There is an important addition to make to this assertion, and that is the difference between goals and structure created by those involved in the play activity compared to goals and structure created externally and enforced by the players.

When playing, it is very common that a player will create a new constraint under which to play; in fact, much fun can be found by adding constraints to something in life. This idea of having boundaries, bumping up against them, and occasionally crossing them is part of the concept of play. A key difference is that these constraints, rules, and goals are emergent from the play activity and are quickly changed and broken during the play session. Conversely, when players agree to play a game, they are agreeing to certain rules and goals that they will all adhere to; changing the rules or the goals during a game without explicit discussion and agreement is not good sportsmanship.

To create a play-based gamification system, then, means to create a space where the players can establish and change their own constraints. When something is no longer fun or playful, the players need the ability to change it to make it more fun and playful. If the players are finding fun in the gamification activities, then there isn't a need for external rewards, as the players are creating their own fun. It is the play, instead of the points, that brings people to become engaged in the real-world setting through the play-based gamification.

A key concept from play that is important when thinking about gamification is that play must be optional (Callois, 2001). If something is not optional, then it is not, by definition, play. If a worker is forced to engage with a game, it is no longer a play experience. To create a play-based gamification experience, the designers and funders of the system must recognize that it needs to be a system that the users choose to engage with and are not forced to engage with. This may cause some points of conflict with gamification in the workplace or school where the participants are forced to engage with the system.

One way to soften a required engagement with a gamification system is to ensure that the system allows for exploration. This falls in line with the concept of Choice; players need to be able to select what they want to play with. By conceptualizing a playground and the freedom it allows, gamification designers can have a mental

model of what kind of gamification space can create a playful experience. Kolb and Kolb (2010) coined the term "ludic learning space" for a play-based space where learning can occur. These spaces are designed to encourage participants to play, and as they play, they also can learn.

One real-world model of play-based gamification is the science museum (Nicholson, 2012b). Science museums are spaces based on elements from play and games used to connect people to the real world. Science museums do not rely upon rewards like points and badges to get people to engage; instead, they use engaging play as the "reward" to drive engagement. Because there are so many things to engage with, attendees decide with their feet if something is engaging; if an exhibit is not engaging, then the attendee moves on to another exhibit. Many modern science museum exhibits are interactive, allowing the participant to engage with the material in the exhibit, and have been designed such that as the patron engages with the activity, he or she can learn by doing something and then seeing the effects of that action.

Gamification designers can use the mental model of a science museum to create a ludic learning space. By conceptualizing the gamification system in a three-dimensional space where players can explore, designers can push out of the traditional structures. Even if the actual implementation of the gamification system has no three-dimensional visualization, the concept of a space where people can roam, explore, see where others are, engage with those others, and set temporary rules and goals can create a gamification space that people engage with because it is playful.

1.4.1.2 Exposition

Exposition in this context is the process of presenting a narrative layer through game design elements. There are two important parts of exposition: the development of a meaningful narrative element, and the presentation of that narrative element to the player. According to Simons, narrative has been the "core pattern for cognition, comprehension, and explanation and is the most important tool for construing identities and histories" (2007, para. 1). One of the challenges in making an engaging game is to balance the development of a strong narrative with the desire of the player to be in control of the game (Simons, 2007). One of the advantages of a narrative is that it can allow the player to see the relationship between the past and the present, and between the present and the future. This can help the listener to make a more informed decision when a life situation mirrors that of the situation in a narrative (Branigan, 2006).

Brand and Knight (2005) did a study of the narrative elements of eighty different games based on four dimensions of narrative elements in games. Evoked narrative embeds the game in a pre-existing world, such as a movie, book, or previous game. Enacted narrative is the use of elements like cut-scenes, fixed game sequences and limited game play to present a backstory to the player. Embedded narrative is when the player discovers elements in the game world that tell a story that occurred in the past; this could be due to actions by characters in the story or actions previously taken by the player. Finally, emergent narrative is when the player is at the heart of creating the narrative by making meaningful choices in the game.

The purpose of using exposition in gamification is to provide the players with additional ways to be connected to the real-world setting. One path of doing this is to create a narrative that mirrors the real world. This may create a gamification system that is more like a simulation than a game, where players can explore different paths and see potential outcomes. In addition, this type of narrative based on the real world can provide information to the participants about the real world setting.

Another path of providing narrative is the use of analogy. The narrative may not directly lead into the real world, but may be analogous to the real world setting. This may be useful because an analogy may provide richness that the real world setting does not, the analogy may motivate and inspire players in different ways, or there are aspects of the real world setting that would be inappropriate to use as a primary narrative. For example, designers creating a gamification system for a marketing department may choose to use a battleground analogy to represent the "war" that goes on in attempting to win over customers. The challenge when using an analogy is ensuring that the player makes the connection between the analogy and the real-world setting; methods for this are explored later as a Reflection activity.

A danger of using a narrative is when the storyline of the narrative is a distraction from the real-world setting. A world of wizards and warriors may be quite engaging for participants to get involved with, but if it is not analogous to the real world setting, it can be problematic for the longer-term transference of players from the gamification system into the real world. Players may get frustrated who are drawn into the gamification system for the narrative and then learn that the goals of the system are to engage them into a completely different real world setting.

Another consideration about exposition is the need to share the story with the players. During the design process, the game designers may start with a backstory that explains what is going on in the gamification world. Through the design process, the focus will be on how the players engage with the current system, and the designers may forget to create the opportunities for the players to learn about and be engaged in the larger story. This can be an issue in alternate reality games, where the players are engaged with a game system without understanding everything that is going on; designers have to work to bring players into the narrative as they explore the game.

A powerful, but challenging, approach to adding an exposition-based layer to a real-world setting is to enable the players to create their own story. This supports Self-Determination Theory in that it helps participants to feel more autonomy about the gamification system, which supports a more positive mental state (Deci & Ryan, 2004). This can be done in several ways: players can create, name, and share their own challenges and goals within the gamification system, players can make choices as to what story-based layers they want to have as an overlay, or players can create their own story on top of game-based mechanisms. This can create the situation where the narrative is then a distraction from the real world, so a designer has to balance that risk with the rewards of allowing people to create their own narrative.

An example where players helped tell the story comes from *Find the Future*, a game-based experience created by Jane McGonigal for the New York Public Library (NYPL). During this game, 500 players (including the author of this chapter) were

brought into the NYPL in the evening and spent all night writing a book about the collections of the library. The game layer empowered players to find 100 marked items around the library, to reflect upon those items, and then to write in response to a challenge that was based upon the items. For example, there was a board game in the collection, and the reflection about the game regarded the fact that board games were used at one point to communicate what it was like to visit an area to people who haven't been there. The writing challenge was to create a game about something in the author's life that few others would experience. As these writing challenges were completed, they were uploaded, laid out into book format, and then bound into a book during the event.

1.4.1.3 Choice

The introduction of Choice into a gamification system puts the player in control of how he or she engages with the system. The theory for the importance of Choice comes from Deci and Ryan's Self-Determination Theory (2004). One aspect of this theory is that a person will have a more positive sense of self-being if he or she has autonomy. In a gamification system, this means that the player has meaningful choices to make within the system.

This is also reflected in the theory of Universal Design for Learning (UDL) from education, where learners are given the ability to learn content in different ways and express their mastery of content in different ways (Rose & Meyer, 2002). This allows each learner to learn in the ways in that he or she is most capable. The underlying concept is that UDL removes barriers between the learner and the content to allow more learners to be successful. Taking this concept into gamification means that the player has to be given choices about how he or she engages with the real-world setting and how success is measured.

The aforementioned concept of Play connects well with the idea of Choice; in order to have a playful experience, the participants need to have choices as to how to engage with the gamification system. By creating a system where the participants can choose what they want to engage with, a more playful ambience can be created for the system. Using the concepts of Play also means that the participant needs to have the choice to **not** engage with the system.

There are several ways to bring in the concepts of Choice to the players. The first, and most commonly used, is to give the players a choice of which activities they want to undertake. This is common in gamifying the classroom; the instructor provides students with a variety of choices as to which assignments they want to do, if they want to work alone or in groups, and in what order they want to take on tasks. Different assignments are worth differing numbers of points, and the students are heading toward a total number of points to reach the grade that they want achieve (Sheldon, 2011). One problem with this model is that weaker students can become lost without some type of guidance as to what to do (Nicholson, 2013).

In order to help players avoid being overwhelmed by choices, one route is to let players choose a goal, and then provide the players with a guide that they can follow

to reach that goal. Badges can be used as a set of signposts instead of goalposts to reduce the danger they have as rewards. Using badges in this way allows the players to set their own goals and be assisted by the system instead of doing things simply because there is a badge attached to them. These routes can be created by the gamification designer, and as players become experts with the domain and the system, can be created by expert players for new players to explore.

Taking this concept further, a gamification designer could create a gamification toolkit around a real-world setting. This would empower the players to select and create their own play-based and game-based elements, to engage with those elements, and to share them with others. To still reach the desired behavioral goals, all of the elements of the toolkit would need to lead players toward desirable outcomes. By using a toolkit like this, players will feel empowered as they engage with the real-world setting, they will be able to create their own gamification systems for others to explore, and the players won't be relying upon rewards for engagement, as the meaningful engagement is the reward.

A toolkit that uses game design elements for real-world changes is SCRATCH by MIT. SCRATCH is a toolkit for kids (of all ages) to learn the basics of programming. The toolkit uses a game-like graphical interface, and players can create their own worlds within SCRATCH. As the players learn to drag and connect blocks, they are learning about logic structures, variables, and the other basic concepts of programming. Players can share their creations with each other through a vibrant Web-based interface and once they have downloaded a project, the players can see the "code" behind the scenes and can modify it in order to learn that way. The players have all of the control with SCRATCH—they can choose what tools to use, they can choose to start from scratch or to start with an existing game, and there's no listing of accomplishments, badges, or points that players are trying to earn. Instead, the reward comes from seeing what this freedom of choice and creation can bring about (Lifelong Kindergarten Group, 2013).

1.4.1.4 Information

The concept of providing information through gamification is based upon the idea of providing the player with the "why" and the "how" behind the gamification system instead of just the "what was done" and "how many points is it worth." Theoretically, the importance of providing information comes out of Self-Determination Theory. One of the three elements of this theory is mastery; people have a more positive mental outlook when they feel they are gaining mastery in a topic area (Deci & Ryan, 2004).

If the player only sees rewards for specific behavior, he or she will learn only what behaviors have value to the game designers. Skinner studied different ways that reward systems change behavior; while reward-based gamification can use Skinner's concepts to change behaviors, the player will not gain a sense of mastery in the real-world setting. Using this concept of behaviorism can create engagement, but participants will most likely not know why they are engaged (other than to earn rewards) (Kramlinger & Huberty, 1990).

On the other hand, humanism is focused on helping the participants understand the reasons for changing behavior. Humanists are focused on understanding the needs of the participants and matching concepts to those needs. This humanistic approach requires the participants to be informed about what is going on. While participants may still earn rewards, they will learn why those actions are being rewarded. As they learn more about the real-world setting and the effect of their actions, they can reach the mastery desired by Self-Determination Theory (Kramlinger & Huberty, 1990).

In order to create a gamification system to support the humanist approach, it is important to provide the player the information needed to connect what he or she is doing to the real-world setting. This is not typically done in many reward-based gamification systems; points and badges are given to players for performing desired behaviors in the same way that treats are given to dogs to get them to behave. Instead of just telling players what is a good thing, designers can use game elements to provide information about why that activity is a good thing.

There are several game-based methods for doing this. The first is with a graphical user display. Over the years, video games have gotten quite good at displaying a significant amount of real-time information to the player. Some games allow the user to customize their own interface through menu choices or modifications. One example of this in the real world is with hybrid cars. Some hybrid cars use a basic graphical element like a tree growing to indicate power-conserving driving habits. Other cars provide graphical displays that display where power is being taken from and how it is being used as the driver brakes and accelerates. Users that pay attention to this information will be able to improve their driving habits in any vehicle instead of just trying to make a tree grow.

Another method of providing a player with information about the real world is through non-player characters in the game. Many games have a guide or sage who provides the player with guidance and assistance, and this character could also provide the player with real-world information. Another way of providing information is with characters who are on different sides of an issue and trying to win the trust of the player by providing him or her with information. One risk in using non-player characters to provide information is trust; if the player has a reason not to trust a character in the game, then the player may also not trust the information provided in the game.

A third way of giving the player information is to tie it in with the Exposition. Embedded narrative is providing the player with information about the backstory through elements in the game world, and this concept of embedded narrative can provide players with information about the real world. Alternate reality games (ARGs) start with the current reality, but then add some type of narrative and gameplay layer that adds narrative to the activity. A method of using an ARG to make a difference is to start with something that players have the ability to change in the real world, and then create the layer based a scenario of "what if" many people made that same choice. For example, the game-based activity, *World without Oil* (http://worldwithoutoil.com), had players creating local news stories exploring the impact of an oil crisis. Players did research about how running out of oil would affect their local communities, and then created stories about steps taken to continue life in an energy crisis. As the players engaged with this activity, they developed a

plan of actions that they could take in the current world to lower their energy consumption. The goal of using this method is to help the player explore the potential impact of current decisions on the future through a narrative that could come true if action is not taken.

Another game-based method of providing information about the real world is through the game mechanics that the player interacts with. Educational games can take two approaches—they can provide the player with information about the topic, or they can immerse the player in a simulation where they engage with mechanisms reflective of the real world. The author's board game, *Tulipmania 1637*, was a recreational board game designed around a bubble stock market that is controlled by the players; to create the game, the author did research on how bubble markets work and used that research in developing the game mechanisms. After playing the game, players can be much more aware of how bubble markets function to avoid being swept up in one.

If the goal is to provide the player with information, it is important to provide that information in different ways. The theory of Universal Design for Learning states that learners need to have access to information in different ways so that each learner can learn in the way that is best for him or her (Rose & Meyer, 2002). Applying this theory here, this means that the gamification designer needs to consider different ways of providing similar information to the player.

Another challenge is that of providing relevant information to the user. This is a more difficult challenge than many consider, due to the theory of situational relevance. This theory states that each user has his or her own knowledge base and background, and because of this, there is no way to know what information will be relevant to a specific user (Schamber, 1994). Libraries are built around this concept; by having a variety of information available, each user is likely to find the information that is most relevant to him or her. There is no one correct source of information for an information need. Gamification designers need to consider providing information for users who are new to the real-world setting as well as information for users who have more experience with the setting.

1.4.1.5 Engagement

In this context, engagement has two definitions. The first is through social engagement, by creating opportunities for participants to engage with others in meaningful ways. This comes out of the third element of Self-Determination Theory, which is relatedness. People have a more positive mental well-being when they feel connected to the world around them (Deci & Ryan, 2004). Many gamification systems are designed as single-player experiences as the player engages in his or her own journey, gaining points by overcoming obstacles. Engagement can be introduced by creating peer groups of participants working through the same gamification system, or by creating connections between participants and people who are already involved with the real-world setting.

A second definition of engagement in this context is the creation of an engaging gameplay experience. One theory behind creating an engaging experience is the

concept of Flow. The basic idea of flow is that the difficulty of the challenges in the gamification system increases as the player's skill increases; a player who is in a state of flow is fully engaged with the system. This state can occur when the player understands what actions are needed to take to reach specific goals (Csikszentmihalyi, 1997). Many gamification systems do not get more challenging, which creates boredom. If the challenges presented to the player are too far above his or her skill level, this creates anxiety and frustration. Engagement is reached when the challenges match the skill level of the player.

These two concepts can be brought together; as players get more skilled with a system, they are better prepared to engage with other players. Creating opportunities for social engagement in a gamification system requires the designer to think about the best time to introduce other players. Until a player feels confident within a game environment, the player may not be comfortable engaging with others. This has led to a game design structure in digital games where players engage with the world, controls, and mechanisms on their own at first, and once they are comfortable, are then ready to engage with other players. While many tabletop games have players engaging with each other from the beginning, many players of these games hesitate to have a conflict with another player until they have spent time engaging with game mechanisms. Forcing a player into a social engagement too quickly can drive him or her away from the gamification system.

There are two types of types of player engagement to consider when creating a gamification system: engagement between players in a social manner and engagement between players through game mechanisms. Social engagement can be facilitated through discussion boards, chat spaces, and other methods of allowing players to talk to each other. Social engagement can also be facilitated through encouraging people to connect their social networking spaces to their in-game profile, although this should not be forced upon a player. Engagement through game mechanisms can come through comparative scoring systems such as leaderboards, players creating challenges for each other, players interacting with each other through game elements, or players working together toward a shared goal. Players can be engaged with each other in both dimensions; looking at the model of multiplayer online games through *Xbox Live*, players preparing to engage with each other on the battlefield through shared game mechanisms are first placed into a shared chat room while the game is prepared and then may have opportunities during the game to talk with each other using voice chat.

Taking these concepts into a gamification system connects well into the aforementioned idea of creating a gamification system that is structured like a museum. When museum attendees are encouraged to engage with each other around a shared exhibit, they can share their viewpoints, ideas, and learn from each other. This can happen in a gamification system if players who are engaged with the same challenge at the same time are able to socially engage with each other as well. The *Nike+* system allows players who are going out to exercise to indicate via a social network that they are starting their workout. Other people can see this and send virtual cheers, which are then send through a mobile device to support the person who is exercising.

Another consideration when developing engagement opportunities for a gamification system is if players will compete, cooperate, or both. Competitive gamification systems can encourage some type of people to put more into the system in order to do better than others, but these same systems can discourage others. A leaderboard, for example, can inspire those at the top of the leaderboard to push each other to stay on top. That same leaderboard can be quite demotivating to those at the bottom of the leaderboard. When the author used leaderboards in a class, he found that the effect on most of the class was to demotivate them to the point where most students had given up doing class assignments as they felt there was no way to catch the leaders (Nicholson, 2013). If the real-world setting is already a competitive setting, such as a sales team, gamification systems can enhance this competition by providing more tools to those who need to engage in the competition.

Cooperative gamification systems are about bringing people together. These systems can tap existing friendships and social networks to encourage players to recruit others whom they already know, and allow friends to work together as a team in the system. The systems can also create challenges that require cooperation; these systems can create the opportunity for people to work together in short-term encounters or to get to know each other for longer-term engagement. These systems can also create the platform for those who are more experienced with a real-world setting to assist those who are new to the setting, which can create very powerful mentorship-based relationships.

Systems can combine both competition and cooperation. One method of doing this is through prior allegiances, such as with sports teams. Fans of the same team can be brought together to compete against fans of other teams through the gamification system. This type of a setup has the advantages of both systems; it creates the opportunities for people to engage with each other around a shared passion, and also can fire up the competitive spirit which can get people more engaged with a system than they might be without the competition. Another twist is to start people as competitors, but as they work through the gamification system, they have opportunities to join forces and work together. This can create a set of shared experiences that are valuable for bonding between strangers and can create teams of players who already respect each other from prior game play.

Another reality about game systems is that players are now used to being able to find other players of the same game through the Internet. This did not used to be the case; if the tools weren't in the system to engage with others, it might be very difficult to find others who were playing the same game. Now forums, Frequently Asked Questions (FAQs), and reference websites are created for most games. Those designing a gamification system may find that players are able to work together to solve challenges in ways that they were not expecting. If there are solutions that players need to work through, there will most likely be a FAQ produced with the answer to those challenges. Many creators of complex alternate reality games who planned on challenges taking weeks to resolve found that ingenious players join forces online and solve these challenges in days. If there are backdoors or shortcuts, they will be posted online for all to find. Designers trying to make a challenge-based gamification system must recognize the power of the shared Internet-based brain and design the tasks accordingly with randomized or customized elements.

1.4.1.6 Reflection

The concept of Reflection is creating opportunities for players to step back and think about their game-based experiences. This opportunity for reflection creates the situation where a learner can connect what happened in the game to elements in his or her own life. Dewey explored the importance of reflection in learning, and argued that without reflection after action, people do not find meaning in what they are doing (Rodgers, 2002). Reflection is commonly overlooked, but it is a powerful tool in helping a game-based activity to have meaning well after the experience is over.

Kolb and Fry (1975) created an experiential learning model around the concept of reflection. This cyclical model starts with a learner having an experience. This is followed by the learner reflecting upon this experience, which forms connections between the experience and other aspects of his or her life. After reflecting upon the experience, the learner then generalizes aspects of the experience to create abstract concepts. Finally, the learner applies those abstract concepts to a new setting, which starts the cycle again.

In the training domain, reflection is represented as debriefing, which is a key part of any training experience. Thiagarajan (2004) has developed a six-stage process for debriefing that may be valuable to those putting reflection into gamification. It starts by having the learners explore their emotions after the learning experience, and then has the learners discuss what happened during the experience. After this, the learners then break down the learning experience to consider what they actually learned, and then explore how these topics can relate to the outside world. Learners are then asked to consider how they could apply these concepts in new settings, and then to consider what their next steps will be based upon their experiences.

Both of these pathways to reflection are much more powerful when they are done with others. During a learning experience, each individual learner will follow one path and see a subset of what was available. Much as with the parable of the blind men each feeling part of an elephant and coming away with a different perception of the beast, learners who see only their own learning experiences do not get a chance to understand the bigger picture. By reflecting about the experience with a group, learners can learn from the insights of others.

Few educational games have reflection components as part of the activity; instead, they depend upon the teacher who is facilitating the game to lead the students through a reflection. When these games are taken out of the classroom setting, they lose much of their effectiveness without the reflection. Designers looking to educational games as a model for educational gamification systems need to be aware that, to be effective, the shared reflection process needs to be part of the gamification system.

There are three basic components of reflection that can be the areas of focus in developing a reflection component in a gamification system. The first is *description*, where the participant thinks about and shares what he or she actually did as they engaged with the activity. This first step is important, as it will help the participants to think beyond the last few things that happened, but go back to the beginning and think about the process and how they changed throughout the experience. The second is *analysis*, where the participants analyze what they did and think about

how their actions connect to their own lives. This helps the participant push outside of the gamification system and seek connections; many times, a participant will make connections that a designer would never have considered. It is because of this that reflections need to come from the participant and not from what the designer thinks the player should reflect upon. Finally is *application*, where the participants are then urged to take action based upon what they have explored. This is where the long-term change can come into play, as it is the point where the behaviors learned in the gamification system are then taken outside of that system (Fanning & Gaba, 2007).

Nicholson (2012c) talks through the steps needed to incorporate these components into educational games. The first step is to shift the role of the user from a participant to someone reflecting about the experience. For reflection to be effective, the user has to shift out of the role of doing and reacting to thoughtful reflection. This requires the gamification design to change the stage upon which the game is presented. This could be done by having the player engage with a character or be given a task in the game that asks the player to recount his or her experiences, such as a reporter or an investigator. Another route is to break the fourth wall in the system and have the designer or a representative of the sponsoring organization engage directly with the player. This could also be tied into Engagement, as mentioned above, where participants are brought together to discuss what went on.

When changing the stage, it is also important that the players understand what their reflections will be used for. Reflections are most powerful when shared, but the players need to know that what they say will be shared with others before they write it. One way to do this is to share the reflections of others with the player first, and then ask what the player would like to share with other people who are engaged with the system. If the engagement is done in a forum-type space, then this will be clear, but if the engagement is done within the shell of a game, the players may not realize what they say will be shown to others.

Another way to enable reflection is to create a timeline of snapshots of the player's activity throughout the game. This can be done as the player engages with the activity, or can be done later by capturing some key element of an accomplishment and asking the player to later reflect upon that. *Nike+* does this after a run by showing participants a map of where they ran with their running speed, asking them how they feel on a scale of smiley to frowny faces, and asking them to log the running surface and their shoes. This information is then stored for the participant to look at later and can be easily shared to a social network. This moment of reflection after each run helps participants to think about what they are doing and how they are feeling after coming in from exercise.

Because each learner will connect an experience to different parts of his or her background, allowing that kind of reflection to be shared can be very powerful. *Librarygame* (http://librarygame.co.uk/) is a gamification platform for libraries that encourages readers to reflect upon books that they have read. This reflection also serves as a way for readers to find others who have similar interests. *World without Oil* (http://worldwithoutoil.com) had players reflect upon and share how their activities in the game would change the way they behaved in their local communities. If the gamification system has a reflection component focused on real-world impact built in

as part of the experience, it will allow the gamification designers to demonstrate the impact their efforts are having on communities around the world; this justification is critical to demonstrate why these efforts matter and should continue to be funded.

1.4.2 Following the RECIPE for Meaningful Gamification

When creating a gamification system, designers should start by working with the sponsoring organization to determine what outcomes they wish to achieve with the system. This outcome should be first focused on the benefits to the player (instead of the benefits to the organization). By creating a player-focused gamification system, designers will be able to be more likely to avoid short-term rewards, as the benefits of the system are in line with benefits for the player. If the gamification system is designed first and foremost to benefit an organization, then it is much more likely to require rewards and have little long-term impact on the players. By focusing on benefits for the players, the organization is more likely to gain long term and loyal participants who do not need a continued string of increasing rewards to stay engaged.

Once the designer has determined the player-based outcomes, then he or she is ready to think about each of the components of the RECIPE for meaningful gamification. The designer should avoid starting with a system based on external rewards; if the outcomes are based on the needs of the players, then the rewards will already be a part of the project. Not all elements of this framework will be appropriate for a gamification system, but it is important to ensure that there are different ways that a user can engage with the system. If there is only a single path of engagement with a gamification system, then this will engage only a single type of user.

Bartle (1996) developed a framework of gamer psychology that can be useful in thinking about the different parts to support with a gamification system. Achievers are players who want to feel as though they have accomplished something significant; they highly value the Mastery element of Self-Determination theory. Explorers are those who wish to engage with breadth of the gamification system and poke around the boundaries of the system; they highly value the concept of Play as the freedom to explore boundaries and the Autonomy element of Self-Determination theory. Socializers are those who want to use the system to meet and engage with others; they are interested in the Relatedness concept of Self-Determination Theory. Finally, Killers are those who challenge and compete against others; they are interested in the competitive aspects and also value the Mastery element of Self-Determination theory. By ensuring that each of these player types has a way to enjoy exploring the system, a gamification designer greatly increases the chances of player engagement.

After considering these issues, the designer can think about how to use each part of the RECIPE to develop a robust system:

- What are the core Play elements in the gamification system?
- How can Exposition be used to help players connect the game activities to the real world?
- How are the players given a Choice of activities?

- What ways can the players be provided with Information about their actions?
- How can the players become Engaged with each other?
- How do players Reflect upon what they have done?

By following these steps, the designer can craft a game layer on a real-world setting that is much more likely to make a long-term and meaningful difference than if the designer simply provided treats for good behavior.

1.4.2.1 Using Reward-Based Gamification with Meaningful Gamification

All of that said, there can still be times when reward-based gamification is valuable. As was mentioned earlier, if the goal of the gamification is not long-term change, then offering rewards can be an easy way to achieve a short-term goal. If there are no player-based outcomes that can be developed because there is no intrinsic motivation for a player to engage with the real-world behaviors, then rewards may be the only way to get people engaged. This system already exists in the real world—money—which is a reward-based system that people use if they want to change the behavior of someone else.

If the goal is long-term change, rewards must be used sparingly. If the player sets his or her own goal, then rewards can be useful to help a player know when he or she has done something to move toward that goal. Badges can be useful as signposts to guide a player toward a goal that he or she previously set. Points can be useful to get people engaged with a system, but the point system needs to be designed such that the value of the points diminishes over time and is replaced by more meaningful ways of engaging with the system. If rewards are used, they should be designed from the beginning to be something that leads into more meaningful engagement, and not an ongoing way to bring people to the system.

Pink talked about when rewards are appropriate to use and when they hamper performance in his book *Drive*: *The Surprising Truth about What Motivates Us*. His book, also based in concepts of Self-Determination Theory, explores how rewards enhance performance when they are used for tasks that are algorithmic, which require little original thought and are about following a set of rules, but diminish performance when the tasks are heuristic, which require creativity and the creation of new solutions (2011). Bringing this over to gamification implies that reward-based gamification can be valuable during the onboarding experiences, where little creativity is allowed, but then those rewards need to be diminished if the player is challenged with tasks that require them to go outside the box. This is when meaningful gamification is useful in helping the player to continue on their exploration of the desired context.

1.5 Conclusion

While both reward-based gamification and meaningful gamification can be tools to get someone engaged in a context, they are only starting points. If the goal is to change someone in the long term, then the gamification system needs to be seen

as a layer that can be removed so that the participant can be left in the authentic real-world setting. This isn't important for a short-term goal, such as getting people to purchase a specific product, or if the organization is willing to offer these rewards for an ongoing basis, such as frequent flyer rewards. But for true long-term change, the gamification system needs to be designed as a journey.

To create true long-term change, the entire gamification system should be designed to come to an end for an individual player. Many gamification systems are designed to engage players in an ongoing basis, offering them more points, levels, and rewards as they continue engaging with the real world. The result is that players stay with the system until they get bored, but if there is no transition element built into the gamification system, the player is not likely to make the switch into engaging directly with the real world.

Instead, for long term change, the long-goal of the gamification system should be to escort a player into deeper engagement with the real-world context and then to leave him or her in the real world. As the player gets more involved in the system, he or she should be spending more time engaged with directly with the real world and less time engaged with the gamification system. One way to do this is to build the gamification system such that it engages with a community of practice or affinity group that already exists. By using gamification to help the participant make connections with an authentic community of enthusiasts, designers can create systems that fade away and leave the participants as new members of this community.

One path of the gamification journey is to start with unmet needs and use a light reward-based layer as the tutorial to bring people into the system. These rewards should quickly be replaced with more meaningful elements, such as a narrative, freedom to choose paths to explore, playful activities, and opportunities to reflect. As the participant engages with this more meaningful elements, he or she should also begin to engage with the existing affinity groups that surround the context. The gamification systems should be designed as layers that are peeled back and create moments of authentic engagement between the participant, the external context, and the affinity groups. The goal of this journey is then to remove the gamification layers entirely. It is in this way that gamification should not be thought of as a cycle, but as a journey to bring about lifelong change.

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