

Strategies for Meaningful Gamification: Concepts behind Transformative Play and Participatory Museums

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Abstract:

Meaningful gamification is the use of game design elements to help users find meaning in a non-game context. Rather than focus on external rewards and a scoring system, meaningful gamification focuses on play to engage participants in a ludic learning space. In this article, concepts of transformative play and learning are combined with principles behind science museums and participatory exhibit design to create strategies for those looking to add meaningful gamification to real world settings.

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Introduction to Meaningful Gamification

Gamification is "the use of game design elements in non-game contexts" (Deterding et al, 2011, p.1) and is a recently coined term for a concept that has been around for some time. Most of the current applications of gamification are based on providing external rewards for some activity; for example, points for being a loyal customer, levels and leaderboards to encourage progress and competition, badges for visiting certain types of locations, and achievements for reaching fitness goals. Gamification systems that focus on Badges, Levels and Leaderboards, Achievements, and Points will be referred to in this paper as BLAP gamification.

For some situations, BLAP gamification is an appropriate choice. External rewards are easy ways to entice customers to engage with a product, and as long as the external reward systems are never taken away, they can be effective (Zichermann & Cunningham, 2011). External rewards damage internal motivation, but if the non-game context is a task for which there is no internal motivation, BLAP gamification can increase engagement when other tools may not work. If the non-game context is a skill with real-life benefits such as learning to tie a shoe or learning to use a new piece of software, then BLAP gamification can be effective.

While using external rewards may be effective, Kohn (1999) presents countless examples of how incentives reduce performance. Society has become accustomed to relying upon rewards like grades, gold stars, and money to motivate people. Kohn argues that rewards and punishments are two sides of the same coin, and that while rewards are easy tools for motivation, helping someone to make their own decisions about their actions without an external controlling behavior will lead to better results (1999). Therefore, even though reward-based BLAP gamification may be an appropriate choice, those looking to use rewards should consider that better performance can be reached through non-reward methods.

BLAP gamification is not an appropriate choice when attempting to change behavior in the long term. As Deci, Koestner, & Ryan (2001) have found from analyzing over one hundred studies in education, when external rewards are used in a controlling manner, internal motivation is

replaced with an internalized sense of control, which is negative. Those receiving rewards to do something will be less motivated to do it when the reward is removed. BLAP gamification and other reward-based systems can do permanent damage to someone's desire to do something without the reward. Using rewards in a controlling way to get children to read books, eat well, learn, or make good life decisions will diminish their own internal motivation to do these things when they get older (Deci, Koestner, & Ryan, 2001).

Learning is the process of making meaning out of life. When someone learns he or she is taking an experience, processing that experience, aligning that experience with previously-held beliefs, experiences, and knowledge (which may result in a new perception of these old experiences) and then preparing to act upon this change; this transformative learning process is centered on finding meaning. (Mezirow, 1991). Each person has a different frame of reference onto the world, so what is meaningful to one person will be different from another. Meaningful gamification is the use of game elements to help someone find meaning in a non-game context, and is therefore a tool to help people learn through changing their perspectives on life.

One definition of games is a "form of play with goals and structure" (Maroney, 2001, para. 2). Therefore, a game can be written formulaically as:

$$\text{Game} = \text{Play} + \text{Goals} + \text{Structure}.$$

BLAP gamification is focused on adding goals and structure to a non-game setting. Therefore, BLAP gamification adjusts this equation to be:

$$\text{BLAP Gamification} = \text{Goals} + \text{Structure} = \text{Game} - \text{Play}.$$

A game without play is not a meaningful activity for many. A key strategy of meaningful gamification is to re-introduce play into the equation in order to help participants find meaning in the underlying activity. While BLAP gamification is focused on adding an overlay of points, levels, achievements, and badges to a real-life setting, meaningful gamification is focused on adding an overlay of play elements to a real-life setting. The goal and structure elements are to be used sparingly, and external rewards should be replaced with engaging play.

These concepts are inspired by Self-Determination Theory (SDT), in that the more control someone has in choosing what to do, the better the chance the person will be internally motivated to do it (Deci, Koestner, & Ryan, 2001). Someone who wants to do something because it is fun is more likely to find an activity to be meaningful than someone who is doing something for a reward or to "learn something." When someone is engaged in a playful space, that person will also learn more easily. Creating playful information-based spaces allows the learner to explore and engage with content on the learner's terms instead of the instructor's terms. Studies show that memory is also enhanced when learning is done in a playful way (Brown, 2009).

The theoretical framework for meaningful gamification, developed by Nicholson (2012), starts with an aspect of SDT – Organismic Integration Theory – which says, in part, that users who have connected an activity to their personal goals are more likely to have increased internal motivation to do that activity (Deci & Ryan, 2004). Situational Relevance theory from Library

and Information Science suggests that different users will find different things to be relevant (Schamber, 1994); therefore, a customized approach to gamification is needed. A theory to guide the development of customized approaches comes out of Universal Design for Learning, which emphasizes the importance of developing ways for users to engage in a system in different ways (Rose & Meyer, 2002). One way of creating these customized approaches is to create a system where users can generate their own goals within constraints, based upon concepts of player-generated content. All of these theories come together under the umbrella of User-Centered Design, which places the needs of the user at the center of every design decision (Norman, 1990). Meaningful gamification then requires the development of a customizable system where users can find game and play elements that help them develop a deeper personal connection to a non-game activity.

The goal of this paper is to create strategies for developing meaningful gamification activities. This is done by first examining concepts of play and transformative learning, and then by exploring concepts behind the design of museum exhibits based on participatory elements. From these concepts of play and participatory museums, strategies for meaningful gamification are then developed.

Defining Play

One of the commonly accepted challenges in studying play is defining what play is. One approach taken by Brown is to present a set of properties that make up play:

"Apparently purposeless (done for its own sake)

Voluntary

Inherent attraction

Freedom from time

Diminished consciousness of self

Improvisational potential

Continuation desire" (2009, p. 17).

This list of features introduces some challenges for gamification implications. The biggest challenge is that the play is an activity that someone chooses to engage with on his or her free will. This concept that play is voluntary is one that has been at the core of many definitions of play; Callois (2001) says that "there is no doubt that play must be defined as a free and voluntary activity, a source of joy and amusement" (p. 6). In order to embrace the concept of play in meaningful gamification, it must be embedded in a context so that engagement with gamification activities is optional and under the control of the participants. Presenting users with a choice is key for the underlying theory of universal design for learning that is part of meaningful gamification (Nicholson, 2012).

Another aspect of meaningful gamification is that players are given control to create or customize the gamification elements. This concept is valuable in allowing the potential for players to improvise, as having a system to play with is very attractive to some types of players. These creations can be shared with other participants, who can then add comments, tags and ratings to aid others. This shared engagement also raises the chance that an individual will find meaning in the activity, as it increases the viewpoints represented.

An important concept of play is that it is synonymous with exploration. As Nachmanovitch says, "Play is the free spirit of exploration, doing and being for its own pure joy" (1990, p. 43). Play is a time to wander and take the scenic route, with the focus on what is being done instead of the rewards for doing something (Nachmanovitch, 1990). Play is a catalyst for learning, as learning happens best when players are encouraged to explore and choose a path that is meaningful to their backgrounds and interests (Hirst-Pasek & Golinkoff, 2003).

When creating a play experience, it can be useful to start with the concept of the stages that many people go through when they play. Scott Eberle developed a set of stages that run in a circular fashion so that when a player has worked through all of them, he or she is ready to start anew. The process starts with *anticipation*, where the player faces the risks of the unknown. The process continues with *surprise* where the player sees something from a new angle or runs into something unexpected. As the player engages with the surprise, feelings of *pleasure* emerge, which then leads to an improved *understanding*. It is at this point where the gamification can become meaningful and convey underlying messages. As the user masters the play activity, he or she gains *strength* through gaining new skills and understanding, and this leads to *poise*, where the user feels relaxed and invigorated to take on new challenges (Brown, 2009).

Transformative Games, Play, and Learning

At the 2012 *Games for Change* conference, Jesse Schell discussed what to call games that are designed to make a difference. The label "serious games" has been used for some time, but many are not happy with it. The conference itself used the label "games for change," but Schell argued for the term "transformative games" (Schell, 2012). The advantage of this term is that it describes what impact the game has from the perspective of the player, instead of presenting the goal of the game (games for change) or the context of the game (serious games).

Since play is a key part of a game, then at the heart of transformative games is transformative play. As gamification is about using game design elements, then it stands to reason that gamification designed to transform someone should be based off game design elements from transformative games. Play elements that are designed to help someone change can then be known as transformative play. One challenge with using the term "transformative play" for this concept is that it is in conflict with the use of the same term in the text *Rules of Play* to talk about play that, during the course of the play, changes the rules and constraints (Salen & Zimmerman, 2003). That text focuses on the change the play has on the play structures, while in the use presented here, the play is transforming the players.

These concepts of transformative games and transformative play for gamification work well with a theory out of education that has been growing for decades in the exploration of adult education - transformative learning. First proposed by Mezirow in 1978, the concept of transformative learning is based upon how adult learners change their assumptions and expectations to create a new understanding about the world. His concept is based upon the idea that each person has developed "boundary structures" based upon his or her upbringing, education, culture, religion, and exposure to the world. These boundaries lead to an individual's expectation of the world and limit what new frames of reference an individual can engage with, creating a "zone of blocked

attention and self-deception" (Mezirow, 1991, p. 5). Transformative learning requires breaking down these boundaries through reflection so that learners can build new schemes of meaning.

Mezirow presents a series of phases to help learners change their mental structures. This starts with a disorienting experience that causes the learners to examine their previously-held beliefs and assumptions. After this, it is beneficial for the learners to recognize that others have been through a similar process before exploring new possibilities. Next, the learners create a plan and are ready to acquire new skills and bodies of knowledge, and can then become more self-confident with their new beliefs in dealing with life (Imel, 1998).

Some of the criticism of this theory is that it can be too rational. Boyd and Myers (1998) present a different, but related, model for transformative learning based on the emotional changes that the learner goes through. This model focuses on the conflict that a learner goes through in trying to combine his or her own personal background with a new framework. A key tool in this process is known as discernment, where the learner first is receptive to a new life viewpoint then recognizes that that viewpoint is authentic and valid. After this, the learner goes through grieving, where he or she recognizes that their old perspective needs to be adapted to bring in new concepts (Imel, 1998).

Combining these two views paints a picture for transformative learning where the learner goes between the analytical and the emotional, changing both on a conscious and an unconscious level. Through engagement with others and engagement with the self, the learner transforms through this process and emerges as a different person (Imel, 1998). Transformative play connects very well to this model; therefore, meaningful gamification in an information-based space can provide stimulus for both the intellectual side and the emotional side of a participant.

An additional angle on transformative learning is Freire's concept of praxis. Praxis is when a learner moves between action and reflection after critical thinking. As the learner struggles with the differences between the self and a new perspective on life, he or she goes back and forth between trying something and considering what happens (Taylor, 1998). This is in line with the experimental nature of play and games, as players try something, then consider what happened, and then try something different. Through engaging in a play-based gamification space, the participants can explore, reflect, and explore further as they reflect upon their previously-held view of life on both an intellectual and an emotional level.

Creating a Ludic Learning Space for Meaningful Gamification

One example of real-world model of playful spaces where people can be changed is leisure settings that have an educational aspect. Some of these spaces include museums, libraries, zoos, and botanical gardens. (Packer and Ballantyne, 2004). Many of these leisure settings employ game elements to help users find personal connections with the non-game setting, so many of these are examples of meaningful gamification.

The term "ludic learning space" was coined by Kolb and Kolb to define a space where play is used to help someone explore and learn about a topic. A ludic learning space is a "free and safe space that provides the opportunity for individuals to play with their potentials and ultimately commit themselves to learn, develop, and grow" (Kolb & Kolb, 2010, p. 27). The designers of a

ludic learning space combine play opportunities along with limits to create a space where participants can choose to enter, leave themselves behind, and engage with play. If opportunities are created, participants can explore this space, discover what is meaningful, engage, reflect, and allow themselves to be transformed (Kolb & Kolb, 2010).

At the heart of the concept of meaningful gamification is creating an information-based ludic learning space where participants can explore and find meaning. This can be a physical space or a virtual space, but the idea is the same - develop a set of mechanisms that can be used for play (and therefore be used for games) that help the participant discover what is interesting and relevant about the underlying non-game context and connect that to his or her prior experiences, knowledge, and skills. Since each participant is finding what is meaningful to him or her, each participant can take away different things from the gamification experience.

Participatory museums like children's museums and science museums are perfect examples of a space where participants play and engage with the space, and each finds what he or she finds as interesting and meaningful. In the design of exhibits for children's museums, there are three concepts that are useful in designing for learning: having a good organizational structure for information aids memory, using both positive and negative examples helps visitors to learn concepts, and creating opportunities for practice is important for building skills (Bunch, 1997). A science museum uses interactive exhibits to allow participants to explore different scientific principles, and then other elements of the museum guide participants through reflection in order to facilitate learning (Chermayeff, Blandford & Losos, 2001). If a participant revisits the museum, he or she will find different things meaningful on future visits, and the museum staff change and update exhibits to make the museum up-to-date and draw in repeat visits. Those creating spaces for meaningful gamification experiences can consider the museum as a model to create an environment for repeat visits.

Theories of Participatory Museums

"Museum play has been described as the phase in which a visitor is assimilating and mastering skills through practice and problem-solving" (Grenier, 2010, p. 79).

Just as meaningful gamification is designed to increase the intrinsic motivation of a participant using game elements that encourage experimentation to overcome challenges, museums create experiences that do the same thing. According to Perry (1993), a museum wanting to build intrinsic motivation needs to engage the curiosity of the visitor, to make him or her feel comfortable and confident in their ability to engage, to challenge the visitor, to empower the visitor with a sense of control, to create a space for play, and to create the opportunity for a visitor to communicate with others. The designer of an information-based space for meaningful gamification can use these six elements as a guide to creating a user experience.

There are three main ways that museums create opportunities for adults to play and learn (Grenier, 2010). The first is through roleplaying, where visitors are put into the role of someone in another time and place. By seeing the world through the eyes of another, visitors can find aspects of that time and place that connect with their own experiences and find meaning. At an exhibit on Greek mythology at Walters Art Museum, guests were able to select and wear a tag

associated with the mythological character that they felt the closest connection to. These guests were then able to engage with the exhibits and with each other in a different way (Simon, 2010).

Another approach is through experimentation, where visitors are invited to explore and try different solutions to a challenge. This game-like experience allows visitors to have their own a-ha moments instead of being told or shown the solution to a problem; this experiential learning, when combined with reflection, can be a powerful tool to teach. In Epcot Center at the Walt Disney World Resort, there is an attraction called the *Sum of All Fears* where participants use principles of physics and trial and error to create a safe roller coaster in a virtual world, and then can get in a car attached to a robot arm and ride a simulation of their coaster.

Finally, museums create collaborative experiences where visitors work with others on an activity. By seeing how others explore a space and engaging in an activity together, visitors are exposed to more viewpoints, thus raising the chance that they will find something meaningful. One common example in a science museum is a large-scale free-standing arch that requires cooperation to build. In addition, if communication between visitors is part of the challenge, then this requires individuals to take in the situation and reflect while working with others (Grenier, 2010). These three concepts - roleplaying, experimentation, and collaboration - provide useful starting points for developing the core mechanisms of a meaningful gamification experience.

It is important in the design of these spaces that visitors not feel that the play is required. A key aspect of effective play is that the player engages with the activity voluntarily. By creating a space that is open and offering many types of engagement, museums can enable individuals to develop intrinsic motivation to explore and learn. This lesson is a critical one to embrace, and ties back into Deci, Koestner, and Ryan's theories of motivation: if the learner feels that they are being led on by rewards in a controlling way, intrinsic motivation is lost (2001).

Another useful concept from participatory museums is delivering a personalized experience. Some museums have played with specific guides targeting different types of users. For example, the Tate Modern created a series of pamphlets guiding users to different subsets of art with titles such as "I was recently dumped" or "I'm an animal freak." The idea is that users have a guide to help them find what is meaningful in the exhibits. A system for meaningful gamification will not force all users through the same path; instead, users will be able to create their own paths based upon what is relevant. This is tied into the theory of Universal Design for Learning presented as part of the theoretical framework for meaningful gamification by Nicholson (2012).

One of the decisions exhibit designers face when offering the user choices is how public these choices are to other patrons. Some museums are choosing to give patrons something wearable to indicate their preferences so that staff and patrons can interact with others in ways in line with these choices. For example, an exhibit on faith asked attendees to label themselves as "believers" or "non-believers," and had them carry a USB device that indicated this choice to all. While this can be powerful, it also can turn some attendees away from the exhibit (Simon, 2010). An important lesson from this for creating public profile is that not all users will want to share their preferences with all, and will be driven away by what might seem to designers to be a valuable tool for engagement.

Another consideration in creating engagement between participants in a museum is to create a platform for sharing thoughts about an item. In order to have a successful participatory experience, patrons need to know what is expected of them, should be immediately thanked for their involvement, and should have a good idea of how their efforts will be used. Museums can make it easy for visitors to answer specific questions about a display and then share those answers by writing on note cards, leaving a digital note, or writing on a wall. Another route is to create situations for engagement between visitors who are taking in an exhibit at the same time. A different example is a library in the Netherlands using book drops keyed to terms like “funny,” “scary,” and “good for families.” When the book is returned, a tag is placed in the library system attaching that term to the book, and these tags are then a way to find books recommended by other patrons.

Whether synchronous or asynchronous, these social engagement opportunities create opportunities for visitors to reflect, share, and then learn about how others see exhibits (Simon, 2010). This concept is perfect for meaningful gamification. By adding opportunities for social engagement to items in the real world, participants can engage with each other around these real-world items. This process can allow someone to reflect, find their own perspective, and then find meaning through learning the perspectives of others.

Science Museums and Science Playgrounds

Another interesting model to consider for meaningful gamification is that of the science playground. A science museum contains exhibits and interpretations, and a participant has to figure out what to do with each exhibit in order to explore the underlying principles. The science museum is a prime example of a ludic learning space. One problem with science museums is that a participant will be eager to manipulate the exhibit, will not read the instructions, and end up missing the underlying points. One goal of a science museum is to reduce the barriers that instructions create, but, at the core, a science museum is built on the concepts of a museum.

A significant challenge is designing a space that balances open play choices and requests for visitors to engage with experiences in a specific order for better learning. Sue Allen, in relating her experiences with the San Francisco Exploratorium, says that this challenge is the "single greatest constraint underlying exhibit design" (2004, p. S18). One strategy for dealing with this is "immediate apprehendability," where participants understand why something is there and how to use it without instructions. A path to this is through user-centered design, where designers consistently use standard ways of manipulating the world that map to real-world examples and activities and reduce the space of engagement to just the critical controls at any one point of engagement. In developing meaningful gamification, this challenge will also be present; players need to have free choice in accordance with the concepts of play, but designers need to make it easy for interested players to learn more about the non-game gamification setting.

A science playground is an outdoor space that is inspired by a playground instead of being inspired by a museum. In these spaces, the participant is engaged with their full body in the "experiments" and can learn about physics, levers, and other machines. Participants already know how to engage with a playground, and are invited to engage with the science playground in the same way. "Science playgrounds seem to match all the qualities of the best of leisure; visitors rate leisure to be at its best when the freedom to participate is high, the activity is

intrinsically motivated, and the activity is engaged in for its own value, rather than to achieve another goal" (Chermayeff, Blandford & Losos, 2001, p. 5). This concept of creating play spaces that participants engage fully in instead of creating exhibits that participants observe is a valuable concept for those creating ludic learning spaces for meaningful gamification.

Strategies for Meaningful Gamification

Different participants will find meaning in different aspects of the real-world context. A goal of someone designing a system to support meaningful gamification is to support many different ways of exploration. In order to do this, the designer can turn to different strategies. While no strategy is dominant for all situations, each strategy that is employed will improve the chances that a participant will find something meaningful. Different topics will lend themselves better to different strategies, so a designer should not see this set of strategies as a checklist to be followed, but rather as aspects to be considered when designing gamification activities.

Focusing on Play-based Gamification Elements

Designers of meaningful gamification activities can start by thinking about how to create play elements that align with a non-game context. In pursuing this strategy, designers recognize that the play activity must be, by definition, optional, so some users will not engage with the gamification, and others will engage only with parts of the system. Creating a play space based on optional elements instead of imposing a scoring system and goals on participants will raise the chances of participants finding meaning and building internal motivation to engage with the non-game context.

When designing the gamification activities, creating an information-based space where participants can explore on their own terms will enable play. Participants should be able to engage with an aspect of the system lightly to explore the breadth of what is available, and then dive in for a deeper level of engagement. Eberle's stages of play can be a useful guide to engaging participants - the initial engagement with a concept should create anticipation about what might happen, which can then lead into a surprise. The participant can embrace the surprise and gain pleasure and understanding. Continued engagement with the concept can lead a participant to gaining strength and poise, once the participant has internalized the concept and found personal meaning. Using positive and negative examples helps with concept building, while allowing practice allows for skill building (Bunch, 1997). This is the model used in science museums, children's museums and other ludic learning spaces to help visitors engage and find meaning in exhibits, and can be used as a model for meaningful gamification.

Play, as an improvisational activity, is strengthened by limits. Creating a space and releasing a player into that space with some limits on behavior allows that player to more fully immerse themselves into the space. By engaging with the limits in the space, the player can create a combination of their own interests and the limits in order to create something new. "Structure ignites spontaneity. Just a touch of an arbitrary form can be introduced into an improvisation to keep it from wandering off course, or to act as a catalyst, as in the seeding of a crystal" (Nachmanovitch, 1990, p. 83).

Another nod toward limits comes from the design of participatory museum spaces. One of the design principles presented by Simon (2010) for museums is that constraints on participation make the project more likely to be successful. While intuition may lead a designer to believe that being more open is better, the reality is that limiting the participation to a very specific area makes it more likely that the patron will get involved. For example, if patrons are working together to create a mural, asking each patron to add one brush stroke with a specific color in a specified area of the mural will be more likely to draw a wide variety of involvement than giving each patron a palette of colors and the freedom to paint anywhere desired. A constrained request lowers the barriers to participation and invites a wider audience to participate.

Conceptually, this is the relationship between play and games. Games provide limits for play through rules. A player engaging with the rules that limit play in one way is then free to explore play in a more intense manner in a limited space. The scoring system in games is designed to reward certain types of play over other ways of engaging with the game. A player is put into conflict when the scoring system awards one sort of play, and the player wants to engage in another sort of play. By reducing the emphasis on scoring and goals, and raising the emphasis on play, a designer can reduce this frustration and allow players to explore the system in a way that is meaningful to them without the point-based penalties of playing the "wrong" way. This is a case where thinking about the activities as simulations instead of games can be more appropriate; typically, in a simulation, aspects of the worlds are recreated and participants can see the impact of their decisions, while in a game, goals and scoring systems are created to see how well a game is played in line with what the designer is seeking.

As an example, summer reading programs at public libraries are traditionally one of the most popular times for children to visit the library. A common BLAP gamification used in summer reading programs is tracking the number of books that are read over the summer. As participants read more books, they are given awards. Sometimes these are competitive awards for the participants that read the most books, and other times these rewards are tied into levels, so that everyone reaching a certain level gets the same awards. If the children participating feel that the rewards are being used to control their behavior, then when they are no longer involved with the summer reading program, their internal motivation to read for pleasure is diminished. Those who came to the program with a strong drive to read will still have a drive to read, but those with a weaker drive may find there is little interest left without rewards. There are library gamification programs in development used to award points, levels, badges, and achievements for any who visit the library, check out books, or write reviews, and these bring with them the same risk of damaging a participant's internal motivation to use library services.

A different approach through meaningful gamification would be to think about play activities that accompany the reading of books. One aspect of play is having a diminished sense of self, and a play method to allow the participant to escape themselves is roleplaying. One goal of a summer reading program could be an end-of-program event where attendees took on the persona of a character from one of their favorite books. This live-scale roleplaying event could have challenges that the characters have to work together and overcome. Parents, teachers, and other members of the public could be invited to engage with the participants as their characters. In order to lead up to this event, many smaller preparatory events will build excitement and raise the chance that participants will make a meaningful connection to the rewards of reading.

Participants could learn how to make costumes and props, could be put in the role of scenario designers to help plan the adventures for the big event, and can have practice roleplaying sessions where they get comfortable being their favorite character. There would be no scoring system and the rewards would be what the participants choose to take away from the event. The overall gamification concept of placing a game-based overlay on a real-world activity still exists, but the focus is on the play instead of keeping score.

Creating Transformative Opportunities through Participatory Activities

If the goal of meaningful gamification is to change behavior, then strategies on creating opportunities for transformative play through transformative learning can be valuable. A key part of transformative learning for adults is that the activities need to encourage reflection and new perspectives on the world. The process for doing this is to create play spaces where participants can engage with elements from the non-game setting on both an intellectual level and an emotional level. A good example of how this is done in a ludic learning space is the science museum with a physical exhibit to manipulate and observe, and interpretation with information to think about. Experiential learning can reach a deeper connection with a learner than passive presentation of information, but both are useful in providing two sides of a message.

For the learning to be truly transformative, participants have to reflect on their own viewpoints and realize that these views are being challenged. As Mezirow (1991) presented, adult learners tend to block information that is in conflict with their current world view, so there needs to be a method of presentation that gets around that block. Play is one way to do that, as play, by definition, creates a "diminished consciousness of self" (Brown 2009). Creating immersive play activities in an information-based ludic learning space can create the opportunities to affect both the emotional and physical sides of participants.

One path to helping adults to step outside their normal space is through role-playing. By having participants identify with a new role, it can create the situation where they see something from a different angle. The transformative game *Darfur is Dying* does this by having players select one of several young siblings to play through a water-gathering sequence, and through this situation, players realize the helplessness of the situation. If the player is unsuccessful, the child avatar is killed and the family dwindles as they attempt to get water.

Another method of bringing together play activities and reflection is through activities where the participants create content that is then shared with others using the model of participatory museums. In order to make an engaging space for sharing, the participants need to understand how their content will be shared and see what others have created. There are several levels at which this could occur.

First, there can be a way for participants to leave commentary about a play activity. This commentary could be in the form of a quick multiple-choice question that allows participants to compare their response to the responses of others. For example, the Ontario Science Centre had an exhibit about traveling to Mars, and asked visitors to answer the question "Would you like to travel to Mars" by having them choose an entrance turnstile corresponding to their answer. They asked the question again by having visitors choose again on the way out of the exhibit. While a

majority of visitors said before seeing the exhibit, they wanted to travel to Mars, after learning about the hardships involved, a majority of visitors did not want to make the trip (Simon, 2010).

While requiring a greater commitment, asking participants to leave a longer comment, either through text, audio, or video, can create a more significant opportunity for more meaningful reflection. Museums have used this concept by putting up boards where visitors can leave notes reflecting upon an exhibit. This is most effective when the reflections are limited; for example, asking participants to connect the activity to something from their past and reflect. In the video game *Demon's Souls*, players who were playing the game online could leave notes for other players and read the notes left behind; this is reminiscent of the world of Multi-User Dungeons (MUDs), which were text-based multi-player online roleplaying games where players could create messages, artifacts, settings, and personas with which other players could engage.

Moving deeper into participatory engagement, creators of gamification spaces can make it possible for participants to become designers. Using the concept of limits presented earlier, as participants move into the final stages of play and gain confidence in working with the system, they can be invited to create challenges, play experiences and their own achievements and badges for things they found most meaningful. *Scratch*, which is a gamified system designed by MIT to help children learn to program through a game-like interface, is designed to allow participants to see the program behind games that other participants have created and to upload their own games to share with others.

One goal that many gamification implementations have is to help players engage socially, and creating opportunities to learn the perspectives of others can allow meaningful engagement and transformative learning. One typical way this is done in BLAP gamification is through badges or achievements, and those participants who gain the same award can engage with each other. Participatory museums have a different process to create social engagement between users. First, the museums provide users with information and experiences and allow the users to interact with the content. Next, the interactions by different users are aggregated and distributed, and users are then invited to interact with these shared aggregations. It is then through these aggregations that users are grouped socially and encouraged to engage (Simon, 2010).

The core difference between this concept and typical BLAP gamification is that in typical gamification, the designers create the badges and achievements that are awarded to users. The resulting social groups are not necessarily coming out of what a user finds meaningful. The book *The Participatory Museum* presents the Nike+ gamification system as an example of how users can go from interacting with the system individually to creating their own achievements to sharing those creations and meeting others through these user-created achievements (Simon, 2010). This is an example of a way through BLAP gamification to allow users to indicate what is meaningful, and then use those indications to help users meet each other.

Thinking in Three Dimensions to Create a Ludic Learning Space

As I was developing this paper, I talked with Scott Eberle from the Strong Museum of Play about the concepts of using museum thinking for gamification. His response was that he felt that "if developers could first think of their projects in 3D that they'd have an easier time of it" (Personal Communication, July 20, 2012). While BLAP gamification offers little to consider in a real

space, thinking about play-based gamification does lend itself to planning as though the design was for a real world space. If the gamification is designed for people who are in the same physical space, then real world elements can be much more engaging than virtual simulations.

Many times, however, projects are distributed digitally, so simulations are required. Thinking about how the gamification might exist in a real world space can help designers create activities that are easier for participants to understand what to do. This does not mean that that digital gamification needs to be in a virtual world, although virtual worlds can be ways to create a more immersive environment. At the heart of this idea is thinking about how to create experiences where a participant learns through active play instead of presenting information that is taken in passively.

One way of doing this is to use some of the strategies from museums to engage users. The concepts of the science playground and Allen's immediate apprehendability (2004) are useful when developing gamification activities. Both of these concepts are focused on the idea of making the play activity something that uses real-life metaphors to enable the participant to engage immediately. By reducing the number of choices available, the attention of the participant can be focused on what to explore next, but having different choices is important to prevent a sense of controlling behavior. A challenge is finding the line between offering a wide space in which to play while presenting limits to enhance the play and controlling the behavior of the participants.

One way that museums think about the layout of space is through space syntax. By looking at the number of spaces a visitor has to pass through to reach each exhibit from each other exhibit, the museum can understand if they have a segregated layout, where exhibits are topologically apart from each other, or an integrated layout, where more exhibits are nearby. Having a set order to small rings of exhibits creates the opportunity to guide exploration without a forceful control, and then having these rings connected via several larger rings allows the freedom to select different topic areas. The physical space can be created so that visitors to a museum run into each other repeatedly as separate to see smaller rings of exhibits, then come back together as they are choosing a new ring (Hillier & Tzorti, 2006). Following this strategy for a digital space, a designer can create a way for participants to see when other participants are engaging with the same activities and create opportunities for social engagement.

Participants in a digital ludic learning space need to have the same affordances that they would have in a physical space - while there are exhibits and places to play, there are also information-based areas, spaces to socialize and quiet spaces for reflection. This is true no matter the platform - a virtual world or a discussion board both need different spaces for different levels of engagement.

An example of this is the online classroom. One of the challenges in presenting a class online is recreating the social spaces that exist both in a classroom and also in the areas of the building containing the classroom. I explored the use of instant messenger tools in conjunction with the asynchronous online classroom as a replacement for the social activities that take place in a classroom hallway (Nicholson, 2002). When creating a set of play-based activities as an overlay to real-world experiences, these extra social and reflection spaces are important to create and

seed so that those who will find meaning when reflecting or engaging with others will have the opportunity to do so. Not all participants will use all spaces, but by having them available, it increases the chances that each can find meaning in the underlying activity.

Conclusions

Gamification offers much more than an overlay of a scoring system on a real-world activity. Meaningful gamification focuses on the participant and creating situations that enable participants to find meaning in a real-world activity, which can then lead to building up internal motivation to engage with that activity. Adding a playful perspective to the design of the gamification activities and considering a framework that encourages transformative learning raises the chance that users will find meaning in the activity. Ludic learning spaces, such as science and other participatory museums, provide models for both real-world and digital gamification environments. To be most likely to be meaningful, gamification models should allow participants the freedom to choose how to engage, the tools to create their own gamification elements, and the ability to build social connections with other users based upon common interests.

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