Preprint of: Nicholson, S. (2012, June). A User-Centered Theoretical Framework for Meaningful Gamification. Paper Presented at *Games+Learning+Society 8.0*, Madison, WI.

A User-Centered Theoretical Framework for Meaningful Gamification

Scott Nicholson, School of Information Studies, Syracuse University
scott@scottnicholson.com http://becauseplaymatters.com

Abstract: Gamification is the "use of game design elements in non-game contexts" (Deterding et al, 2011, p.1). A frequently used model for gamification is to equate an activity in the non-game context with points and have external rewards for reaching specified point thresholds. One significant problem with this model of gamification is that it can reduce the internal motivation that the user has for the activity, as it replaces internal motivation with external motivation. If, however, the game design elements can be made meaningful to the user through information, then internal motivation can be improved as there is less need to emphasize external rewards. This paper introduces the concept of meaningful gamification through a user-centered exploration of theories behind organismic integration theory, situational relevance, situated motivational affordance, universal design for learning, and player-generated content.

A Brief Introduction to Gamification

One definition of gamification is "the use of game design elements in non-game contexts" (Deterding et al, 2011, p.1). A common implementation of gamification is to take the scoring elements of video games, such as points, levels, and achievements, and apply them to a work or educational context. While the term is relatively new, the concept has been around for some time through loyalty systems like frequent flyer miles, green stamps, and library summer reading programs. These gamification programs can increase the use of a service and change behavior, as users work toward meeting these goals to reach external rewards (Zichermann & Cunningham, 2011, p. 27).

Gamification has met with significant criticism by those who study games. One problem is with the name. By putting the term "game" first, it implies that the entire activity will become an engaging experience, when, in reality, gamification typically uses only the least interesting part of a game - the scoring system. The term "pointsification" has been suggested as a label for gamification systems that add nothing more than a scoring system to a non-game activity (Robertson, 2010). One definition of games is "a form of play with goals and structure" (Maroney, 2001); the points-based gamification focuses on the goals and leaves the play behind. Ian Bogost suggests the term be changed to "exploitationware," as that is a better description of what is really going on (2011). The underlying message of these criticisms of gamification is that there are more effective ways than a scoring system to engage users.

Another concern is that organizations getting involved with gamification are not aware of the potential long-term negative impact of gamification. Underlying the concept of gamification is motivation. People can be driven to do something because of internal or external motivation. A meta-analysis by Deci, Koestner, and Ryan of 128 studies that examined motivation in educational settings found that almost all forms of rewards (except for non-controlling verbal rewards) reduced internal motivation (2001). The implication of this is that once gamification is used to provide external motivation, the user's internal motivation decreases. If the organization starts using gamification based upon external rewards and then decides to stop the rewards program, that organization will be worse off than when it started as users will be less likely to return to the behavior without the external reward (Deci, Koestner & Ryan, 2001). In the book *Gamification by Design*, the authors claim that this belief in internal motivation over extrinsic rewards is unfounded, and gamification can be used for organizations to control the behavior of users by replacing those internal motivations with extrinsic rewards. They do admit, though, that "once you start giving someone a reward, you have to keep her in that reward loop forever" (Zichermann & Cunningham, 2011, p. 27).

Further exploration of the meta-analysis of motivational literature in education found that if the task was already uninteresting, reward systems did not reduce internal motivation, as there was little internal motivation to start with. The authors concluded that "the issue is how to facilitate people's understanding the importance of the activity to themselves and thus internalizing its regulation so they will be self-motivated to perform it" (2001, p. 15). The goal of this paper is to explore theories useful in user-centered gamification that is meaningful to the user and therefore does not depend upon external rewards.

Organismic Integration Theory

Organismic Integration Theory (OIT) is a sub-theory of self-determination theory out of the field of Education created by Deci and Ryan (2004). Self-determination theory is focused on what drives an individual to make choices without external influence. OIT explores how different types of external motivations can be integrated with the underlying activity into someone's own sense of self. Rather than state that motivations are either internalized or not, this theory presents a continuum based upon how much external control is integrated along with the desire to perform the activity. If there is heavy external control provided with a reward, then aspects of that external control will be internalized as well, while if there is less external control that goes along with the adaptation of an activity, then the activity will be more self-regulated.

External rewards unrelated to the activity are the least likely to be integrated, as the perception is that someone else is controlling the individual's behavior. Rewards based upon gaining or losing status that tap into the ego create an introjected regulation of behavior, and while this can be intrinsically accepted, the controlling aspect of these rewards causes the loss of internal motivation. Allowing users to self-identify with goals or groups that are meaningful is much more likely to produce autonomous, internalized behaviors, as the user is able to connect these goals to other values he or she already holds. A user who has fully integrated the activity along with his or her personal goals and needs is more likely to see the activity as positive than if there is external control integrated with the activity (Deci & Ryan, 2004).

OIT speaks to the importance of creating a gamification system that is meaningful to the user, assuming that the goal of the system is to create long-term systemic change where the users feel positive about engaging in the non-game activity. On the other side, if too many external controls are integrated with the activity, the user can have negative feelings about engaging in the activity. To avoid negative feelings, the game-based elements of the activity need to be meaningful and rewarding without the need for external rewards. In order for these activities to be meaningful to a specific user, however, they have to be relevant to that user.

Situational Relevance and Situated Motivational Affordance

One of the key research areas in Library and Information Science has been about the concept of relevance as related to information retrieval. A user has an information need, and a relevant document is one that resolves some of that information need. The concept of relevance is important in determining the effectiveness of search tools and algorithms. Many research projects that have compared search tools looked at the same query posed to different systems, and then used judges to determine what was a "relevant" response to that query. This approach has been heavily critiqued, as there are many variables that affect if a user finds something relevant at that moment in his or her searching process. Schamber reviewed decades of research to find generalizable criteria that could be used to determine what is truly relevant to a query and came to the conclusion that the only way to know if something is relevant is to ask the user (1994). Two users with the same search query will have different information backgrounds, so that a document that is relevant for one user may not be relevant to another user.

This concept of "situational relevance" is important when thinking about gamification. When someone else creates goals for a user, it is akin to an external judge deciding what is relevant to a query. Without involving the user, there is no way to know what goals are relevant to a user's background, interest, or needs. In a points-based gamification system, the goal of scoring points is less likely to be relevant to a user if the activity that the points measure is not relevant to that user. For example, in a hybrid automobile, the gamification systems revolve around conservation and the point system can reflect how much energy is being saved. If the concept of saving energy is relevant to a user, then a point system

based upon that concept will also be relevant to that user. If the user is not internally concerned with saving energy, then a gamification system based upon saving energy will not be relevant to that user. There may be other elements of the driving experience that are of interest to a user, so if each user can select what aspect of the driving experience is measured, more users will find the system to be relevant. By involving the user in the creation or customization of the gamification system, the user can select or create meaningful game elements and goals that fall in line with their own interests.

A related theory out of Human-Computer Interaction that has been applied to gamification is "situated motivational affordance" (Deterding, 2011b). This model was designed to help gamification designers consider the context of each of the elements of a gamification system. This theory is based upon the underlying concept of "motivational affordance" is that a user is motivated by an aspect of a system only when there is a match between that aspect and the background of the user, which is very similar to the concept of situated relevance. Deterding moves this underlying concept forward by introducing the importance of the organizational context into which the activity is situated in the gamification system. If an element of gamification is tied to a financial award in a company, the perception of the gamification as a controlling activity by a user is greater than if the same element leads to nothing more than a badge or listing on a leaderboard (2011b). Putting these two theories together means that for meaningful gamification, it is important to take into consideration the background that the user brings to the activity and the organizational context into which the specific activity is placed. A significant challenge in creating this type of a broad system is developing a strategy to encompass a wide variety of user backgrounds, desires, and skillsets.

Universal Design for Learning

The theory of Universal Design for Learning (UDL) from the field of Education is a guide for instructional designers to help them create course content that is appropriate for a diverse group of learners. The idea behind UDL is that courses should be designed so that students can demonstrate learning in a variety of ways. For example, instead of having all students take exams or give presentations, students should be able to select the way in which they demonstrate how they have met learning outcomes. The result is a course that is meaningful for a wider variety of learners (Rose & Meyer, 2002).

There are three strategies to creating content for a wide variety of learners. The first strategy is to think about different ways to present the content of learning- the "what". The second strategy is to think about providing different activities for the learner to explore and demonstrate mastery of content - the "how". The third strategy is to give learners different paths to internalize content and become engaged and motivated - the "why" (Rose & Meyer, 2002).

The underlying concept of UDL applies to the creation of meaningful gamification. If users are allowed to demonstrate their mastery of an activity in only one way, then the system will not be meaningful to users who can perform activity but demonstrate it in a different way than what is measured. The design implication of this is that gamification systems need to either allow different ways for users to achieve goals so that users can be involved in the ways most meaningful to them or to allow users to set their own goals and achievements.

The different UDL strategies can be used to think through the different aspects of a gamification project to add additional ways to making the gamification meaningful. The "what" in gamification are the aspects of the underlying non-game activity that are being transformed with game design elements. Many gamification projects focus on only a single activity; if a user does not perform that activity well, then he/she will not be able to participate in the rest of the gamification system. By thinking of the desired outcomes of the non-game activity, designers can consider other ways that users can reach the same outcome. The "how" in gamification refers to how the game elements are manifested. This can be the points and achievements system or, preferably, the more meaningful elements that are embedded within the underlying non-game activity.

For some users, a point system attached to public status is important enough to them to perform a dull task, but for others a leaderboard is meaningless and the task itself needs to be transformed through gameful activities to provide that connection. Providing multiple ways to achieve within the gamification

system can allow users to select those methods most meaningful to them. The "why" is an exploration of different ways to help the users connect the gamification process to their own background. A scoring system that has no deeper connection to the underlying activity than a quantification provides no way for a user to make a meaningful connection to the activity. By making each application of a game element be meaningful in a different way, the chances a user will find some way of connecting to the gamification more deeply will increase. Ensuring that there are a variety of ways for the "what", the "how", and the "why" will allow more users to find meaningful connections to the gamification. Developing this wide variety of aspects to a gamification project can be a challenge, but opening up the design of the gamification to users of the system can help designers overcome that challenge.

Player-Generated Content

One game design feature that has grown in popularity with the ease of online connectivity through games is player-generated content, which some in Game Studies are calling “Gaming 2.0” (Djaouti, et al, 2010). This concept has been at the center of tabletop roleplaying games for decades, and early text-based Multi-User Dungeons (MUDs) allowed players to generate content within the game that others could then interact with. Games such as *Half Life* have opened themselves up to modification, so that players can create new worlds for others to explore; some of these modifications, such as the *Counter-Strike* modification for *Half Life*, were as popular as the original game. *Second Life* was centered around player-generated content in a massively multiplayer virtual world, and as online networks behind console play have strengthened, games like *Little Big Planet* allow players to engage with what others have created. *World of Warcraft* allows players to create and share new aspects of the user interface to the game, and the company integrates the best ideas into new official releases of the game’s interface. What is common in these games is that the game designers created not only a game, but developed a system to allow others to create and modify the games. Allowing player-developed content extends the life of a game and allows the designers to see how creative users can be with the toolkits provided.

One of the ways to allow users to make gamification experiences that are more meaningful is to allow players to set their own goals. Deterding (2011a) puts it well in his the notes to his Google Tech Talk on gamification: “One practical way to do this is to allow users to set and customize their own goals within the platform. The design challenge here is to support and guide the user in setting long- and short-term goals such that they become achievable and provide experiences of mastery on the way” (p. 37). An example of this is *Chore Wars,* where participants create quests for a household or other shared space to complete routine chores. McGonigal talks about numerous cases how Chore Wars improved engagement with household chores as a case in her book, *Reality is Broken* (2011).

The freedom that users have in setting their goals can be based upon the needs of the gamification system. In educational contexts where certain learning goals must be met, then constraints can be placed upon the user’s choices to guide him or her toward making choices that are both meaningful to the user and that meet the needs of the organization. By being transparent about the constraint process, the users can learn about why constraints are in place, become more informed about learning outcomes, and then see how the game elements are connected to the learning outcomes.

When applying the concepts behind player-generated content to meaningful gamification, the underlying idea is that the designers develop a system where users can create their own tools to track different aspects of the non-game activity, to create their own leveling systems and achievements, to develop their own game-based methods of engaging with the activity and to be able to share that content with other users. Systems where users can transform tasks by adding elements of play and then share their new methods allow creative users to think about how to make a task fun without an external reward. Users working toward the same set of goals can then form communities around those goals. These communities of learners can share experiences and increase their learning around the non-game activity, which OIT suggests is a method more likely to create truly internalized experiences.

Bringing it Together through User-Centered Design

All of these theories have one thing in common: the user is at the center. The theory of user-centered design is ensuring that the user's needs and goals are the primary consideration at every stage of the

process (Norman, 1990). Each of the theories presented here provides different ways for a designer to consider the user. The concept of putting the user at the center of the gamification project is so critical that it is key in the definition of meaningful gamification:
Meaningful gamification is the integration of user-centered game design elements into non-game contexts.

The implications of focusing on user-centered design can help designers avoid meaningless, or even harmful, gamification. Using external rewards to control behavior creates a negative feeling in the user about the non-game context; therefore, the use of external rewards is not user-centered. Instead, user-centered game design elements have to be meaningful to the user and should result in positive change in the user's mindset. During every decision in the gamification process, the user-centered designer must ask: "How does this benefit the user?"

Another critical component of user-centered design is that of information. In order for a user to understand what is happening, it is important that he or she has more than just a numeric score attached to an activity. Having only a numeric score does not allow the user the information to understand what is really going on and can make the user suspicious and questioning of the motives behind the score. The creation of that scoring system is based upon assumptions and biases of the organization creating the gamification system, and therefore, the user is more likely to perceive the gamification as externally controlling. By making systems more transparent with the goal of providing the user with information instead of providing the user with a score, the user can then create their own games and goals. Constraints on these goals can be provided, if needed, with appropriate justification so that the user has the information needed to make a decision.

The opposite of meaningful gamification would be meaningless gamification, and at the heart of meaningless gamification is organization-centered design. Gamification tactics that rely upon points and levels leading to external rewards that are not related to the underlying activity are not concerned about the long-term benefits of the gamification on the user; they are focused on increasing the organization's bottom line in the short term. These designers are first asking: "How does this benefit the organization?" instead of how the gamification benefits the user. Creating meaningful gamification that benefits the user and creates a positive impression of the non-game context will then have a long-term benefit for the organization. The benefits to the company result from the positive and meaningful benefits for the user.

Another threat to meaningful gamification is mechanism-centered design. A trap that game designers and companies can fall into is seeing a new or interesting game mechanism and deciding to build that into the gamification. Sometimes, this clever mechanism doesn't integrate well into the non-game setting; therefore, while a novel mechanism can draw users into the gamification, the lack of integration means that users won't fully engage with the underlying activity. Another risk is for an organization to bring in a "gamification consultant" who applies a standardized points-based approach to every setting. Bringing in a generic game activity that doesn't match the underlying non-game setting will create a hollow gamification experience. In both examples, the focus is not on what is best for user, but on what is the best, coolest, or easiest-to-implement game without consideration for the user's underlying needs and goals.

Meaningful gamification is more challenging to create than meaningless gamification, as designers can't rely upon a cookie-cutter approach of meaningless points leading to external rewards. Instead, the game elements need to come out of aspects of the underlying activity that are meaningful to the user. Instead of relying upon external rewards as the sole way to motivate, connections between the game elements and important aspects of the activity are presented to help the user make relevant connections between aspects of the non-game activity and his or her own goals and desires. Since users are different, a design challenge is either offering a wide variety of ways to interact with the game or creating a flexible system that will allow user customization so it will be relevant. Introducing the ability to share these customizations will allow users to find others that are similar, which can be a meaningful result of the gamification process.

Examples of Meaningful Gamification

Rather than using a point system, meaningful gamification encourages a deeper integration of game mechanisms into non-game contexts. Meaningful gamification techniques focus on the consideration of aspects of the underlying activity to understand where an integration of game elements makes sense. Even more intriguing is to go beyond games into the integration of pure play elements. A game without scoring can be called play; therefore, removing the scoring elements from a gamification context encourages a focus on the integration of play. An excellent example of this is a subway in Sweden where they added a piano keyboard to the stairs going into the subway, and many more people took the stairs instead of the escalator (Volkswagen, 2009). Perhaps this concept is important enough for its own term: "playification" is the use of play elements in non-play contexts.

A class of examples of meaningful gamification is most Alternate Reality Games (ARGs). In these games, game elements are used to tell a story that is based upon a non-game setting. Many of these games allow a variety of ways to interact with the ARG and emphasize an engaging story and interesting activities instead of relying upon a point system and leaderboards. While these score-based elements may exist in the ARG, a well-designed ARG doesn't need these tools to create an engaging and meaningful experience. Many ARGs have community-based aspects so that participants can find meaning through group engagement as well as their personal interest. Developing an ARG is a time-consuming process that requires designers to understand the non-game setting well enough to integrate gaming elements in a meaningful way. McGonigal argues that good ARGs present obstacles within a story with a wide scope, and that players feel satisfied and positive about their own abilities by overcoming them (2011).

Another example of meaningful gamification is the display of the Toyota Prius. This game-like display shows the driver if power is coming from the fuel or battery, and when power is being directed back into the battery. The driver can get information about how their driving is affecting the car. This information enables the driver to create their own games and goals. If the car simply presented the driver with a “Green Score” without this information, the driving experience would be much less meaningful. Taking this concept further, a physical therapy visualization tool that allows the patient to see how the body is changing as he or she does each repetition can allow each patient to set a different goal that is meaningful. The therapist can help the patient set goals through constraints, and by exploring those constraints, the patient can then understand how the physical therapy connects to the exercise goals. By giving the patient information and control over goals, the patient is much more likely to find the internal meaningful connections to be able to continue the therapy away from the therapist.

Conclusion

In conclusion, meaningful gamification puts the needs and goals of the users over the needs of the organization. If users have a positive and meaningful game-based experience that is well-connected to the underlying non-game setting, then the organization will benefit in the long term. Meaningful gamification focuses on introducing elements of play instead of elements of scoring. The same activities will not be meaningful to all users, so designers need to provide a variety of game-based activities to appeal to different users or a customizable gamification system where users can create their own activities. The dependence upon external rewards for motivation should be replaced by connections between the non-game activity and needs or goals in the user's life based upon information, which will allow users to have a positive internalized experience. The resulting user-centered meaningful gamification will result in longer-term and deeper engagement between participants, non-game activities, and supporting organizations.

References

Bogost, I. (2011, August 9). Gamification is bullshit. *The Atlantic: Technology.* Retrieved from http://www.theatlantic.com/technology/archive/2011/08/gamification-is-bullshit/243338/

Deci, E. and Ryan, R. (2004). *Handbook of Self-Determination Research.* Rochester, NY: University of Rochester Press.

Deci, E., Koestner, R., & Ryan, R. (2001). Extrinsic rewards and intrinsic motivations in education: Reconsidered once again. *Review of Educational Research, 71*(1). 1-27.

Deterding, S. (2011a). Meaningful play: Getting «gamification« right. *Google Tech Talk.* Retrieved from: http://www.slideshare.net/dings/meaningful-play-getting-gamification-right

Deterding, S. (2011b). Situated motivational affordances of game elements: A conceptual model. Presented at *Gamification: Using Game Design Elements in Non-Gaming Contexts*, a workshop at *CHI 2011*. Retrieved from http://gamification-research.org/wp-content/uploads/2011/04/09-Deterding.pdf

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining "Gamification". Proceedings from *MindTrek '11*. Tampere, Finland: ACM.

Djaouti, D., Alvarez, J., & Jessel, J.(2010). Can “Gaming 2.0” help design “Serious Games”?: a comparative study. *Proceedings of the 5th ACM SIGGRAPH Symposium on Video Games*, *Sandbox ’10*, New York: ACM. 11–18.

Norman, D. (1990). *The Design of Everyday Things*. New York: Doubleday.

Maroney, K. (2001). My entire waking life. *The Games Journal*, May. Retrieved from http://www.thegamesjournal.com/articles/MyEntireWakingLife.shtml

McGonical, J. (2011). *Reality is Broken*. New York: Penguin Press.

Robertson, M. (2010). Can't play, won't play. *Hide & Seek: Inventing New Kinds of Play*. Retrieved from http://www.hideandseek.net/2010/10/06/cant-play-wont-play/

Rose, D. & Meyer, A. (2002). *Teaching Every Student in the Digital Age: Universal Design for Learning.* Alexandria, VA: ASCD.

Schamber, L. (1994). Relevance and information behavior. In M. E. Williams (Ed.), *Annual Review of Information Science and Technology 29*. Medford, NJ: American Society for Information Science. 3-48.

Volkswagen (2009). Piano staircase. *Thefuntheory.com*. Retrieved from http://www.thefuntheory.com

Zichermann, G. & Cunningham, C. (2011). *Gamification by Design: Implementing Game Mechanics in Web and Mobile Apps.* Sebastopol, CA: O'Reilly Media.