The Relationship of Game Elements, Fun and Flow

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Abstract

In recent years, gamification is being received attentions as a marketing solution to attract voluntary participation from users. Gamification is believed to help people get experience about fun by using elements of game mechanism. This solution has the purpose to attract voluntary participation from users and reach the state of flow. This study, therefore, attempts to define the elements of game mechanism in gamification and to know how each game element affects types of fun. In addition, we investigate how each type of fun affects the flow and propose more effective elements of game mechanism to not only game developers but marketing managers as well.

Keywords: Flow, Fun, Game Elements, Gamification

1. Introduction

Johan Huizinga discussed the importance of the play element of culture and society in his book 'Homo Ludens'. One of the most significant (human and cultural) aspects of play is that it is fun[15]. As technology advances, play changed to game and researchers studied the fun of game. Gamification is introduced at the Gamification Summit in 2011 and is being emerged as marketing solution by researchers as well as game developers. Gamification gets greater impact by facilitation of smartphones and SNS environment. Gamification was mostly focused on point and reward until now. However, it needs to find whatever the elements induce user's reaction for flow for successful gamification. First of all, we have to define the elements of gamification. Gabe Zichermann defined that gamification is the process of using game thinking and game mechanics to solve problems and engage users[10]. Meanwhile, Deterding et al. proposed that gamification is using game design elements in non-gaming contexts[23]. In other words, gamification makes people to get experience about fun using the elements of game mechanism. These are applied to gamification the same because gamification uses the elements of game. There are many type of fun that user can feel. The fun was analyzed by many researchers. In this paper, the type of fun is defined based on the previous research. Jon Radoff proposed that users improve their concentration and participation when fun is to be the purpose itself[16]. This state is called 'flow' by Csikszentmihalyi[19]. Some previous studies researched between game elements and flow[22]. And other researchers made a study between fun elements and flow1. These studies argued the relation about game elements, fun and flow partially. This paper attempted to find the relation about game elements, fun and flow in the chain of experience process. In addition, we tried to find more effective element to affect four types of fun and more effective type of fun to affect flow. In the end, we expect that our research would aid game developers and other researchers to make product or service using gamification.

2. Theoretical Background

2.1 Game Elements

The elements of game mechanism mean the functional part of game and the rule of game. It is discussed by many previous studies. As the game market is growing,

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is emerging a research that analyzes the game elements of MMORPG and social game. One of studies defines the game elements of MMORPG are story, basic operation learning, challenge, reward, interaction and immersion[13]. Another researcher defines multi-play, virtual community, the experience in virtual space, interaction, character, competition, realistic and addition of contents[14]. Meanwhile, social game grew according to the growth of mobile equipment and SNS. The game elements of social game are defined as social interaction, community, scenario, graphic, reward and operability. Gamification using game elements also has characteristics that are similar to MMORPG and social games. Gabe Zichermann proposed the elements of game mechanism, which include points, badges, levels, challenges, leaderboards, onboarding, social engagement loop, feedback[10]. Bunchball Inc. that provides gamification solution proposed the elements of game mechanism by points, levels, challenges, virtual goods, leaderboards, gifts and charity[2]. This paper adopts the definition of game elements in gamification. Leaderboard means that users can be measured by comparing their performance. This is based on the point that is given in accordance with the performance. Therefore, leaderboard and point can be integrated by another. Level means the change of difficulty which is the status of progress or user's growth degree. Challenge is the purpose provided in a game. The difficulty of challenge should be based on user's level and users could feel accomplished when they achieve it. Virtual goods, gift, and charity are not considered in this paper because they are by-product of the challenge. Social engagement loop induces the act and exchanges the opinions by connecting other users. For this reason, Social engagement loop and onboarding which induces an act to try the game have a common ground. Therefore, they can be integrated by engagement. Based on these definitions, the game elements are redefined as seen in Table 1 below.

Table 1. The game elements

Game Elements	Contents
Leaderboard	Board with which the user's performance can be checked
Level	Changes in difficulty, Growth state of users
Challenges	Goals which user have to be completed
Engagement	Participation in the contents through user's interaction.

2.2 Fun

Gamification improves user's concentration and participation when it is to be the purpose itself because gamification uses the game elements. Many studies discussed the fun and the elements of fun. However, this paper focuses on the psychological state called fun, not the elements of fun. Emotional fun and cognitive fun were classified by Kintsch. Emotional fun is direct reaction caused by certain events. Cognitive fun is fun which is induced in the active process when new information is inferred or understood[6,17]. Cho defined the 3 type of fun to add social fun. Social fun feels through social interaction in the group[29,30]. Cho defined the elements of each fun; emotional fun includes novelty, aesthetic and emotional arousal. Cognitive fun includes problem solving, discovery and immersion. Social fun includes participation, cooperation and competition. Jeoung defined more exquisitely the three types of fun through extracting the elements from the previous studies[12]. Table 2 shows the classification of fun when people play game.

Table 2. The game elements

Type of Fun	Contents
Emotional Fun	Direct reaction caused by certain events (Novelty, Aesthetic, Emotional arousal)
Cognitive Fun	Fun which is induced in the active process when new information is inferred or understand (Problem solving, Discovery, Immersion)
Social Fun	Fun through social interaction in the group (Participation, Cooperation, Competition)

2.3 Flow

According to Csikszentmihalyi's study[19], optimal experience composes consciousness orderly and it is time that can use the attention for the goal freely because there is not external threat to defend the ego. He explained that this state is flow. He mentioned two types of flow tendency; Pleasure and Enjoyment. Pleasure can be experienced when human desire is satisfied. Enjoyment is the inducing experience to improvement (or growth). It means when you face a challenge, you achieve it using your skill and you improve your ability through this experience[13]. He mentioned that the balance between the challenge and skill is very important for optimal

experience. If you experience Flow, you forget self-consciousness and you respond to only clear and obvious feedback. In addition, you can experience the sense of control about environment[20]. This paper emphasizes the optimal experience with enjoyment, which is the flow with fun. User can have flow state and feel improve their ability through the fun that can be achieved in various situations. There are the conditions to reach Flow more easily; clear purpose and rule, ability to solve challenges, immediate feedback and controllable environment. These characteristics are similar to the characteristics of game. When the users play the game or use game elements, the users can reach flow more easily. Flow has an order of consciousness and creates fun to users. The characteristic that creates to users is autotelic. Autotelic is described as having a purpose in and not apart from itself. If the users have the experience of flow in using the products or service applied gamification, they would have fun and spend a great deal of time in using the product or service.

3. Research Model and Hypothesis

We adopted the definition of game elements and four kinds of fun through the previous research. We analyzed the mediating effect of fun and the relationship between game elements and flow, in order to find more effective game elements to flow (Figure 1 below for the research model).

3.1 Game Elements and Fun

The essence of play is defined by the fun[15]. Game elements are the specific function which can activate the game and fun is the emotional result through the game elements. Game elements induce the action and make an immersive experience[24]. Pine and Gilmore mentioned the four stages of experience which is entertainment experience, education experience, escapist experience and esthetic experience in the Experience Economy[13]. Entertainment experience is the experience which can attract interest. It is used by essential element in experience economy. Game is based on the entertainment experience. In other words, it is essential for flow to have fun through the game. The following hypothesis can be proposed;

H1: Leaderboard will have a positive effect to Emotional Fun.
H2: Leaderboard will have a positive effect to Cognitive Fun.
H3: Leaderboard will have a positive effect to Social Fun.
H4: Challenges will have a positive effect to Emotional Fun.
H5: Challenges will have a positive effect to Cognitive Fun.
H6: Challenges will have a positive effect to Social Fun.
H7: Level will have a positive effect to Emotional Fun.
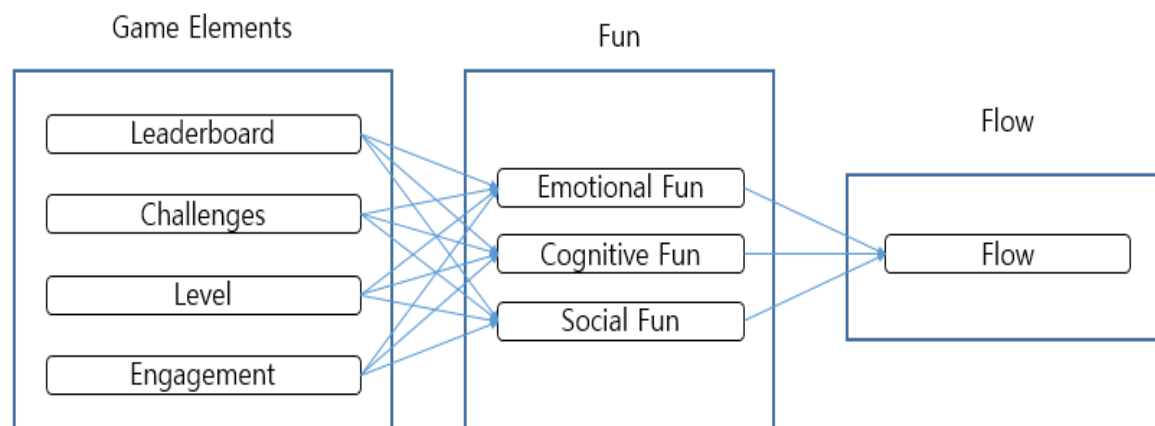H8: Level will have a positive effect to Cognitive Fun.

Figure 1.   Research Model.

H9: Level will have a positive effect to Social Fun.

H10: Engagement will have a positive effect to Emotional Fun.

H11: Engagement will have a positive effect to Cognitive Fun.

H12: Engagement will have a positive effect to Social Fun.

3.2 Fun and Flow

Jon Radoff proposed that users improve their concentration and participation when fun is to be the purpose itself[16]. Bunchball mentioned that game mechanism makes users can be interested as exciting human desired[2]. The state which is motivated to experience is due to the result of the desire and motivation. And they also mentioned game mechanism can explain human desire. Dewey mentioned that interest can be defined by "inter+esse: What is between", meaning that mind and think are captivated in some status[13]. This is similar to the state of flow. Cho & Choi found the possibility that emotional elements are affected to the action and result through the relationship between implicit knowledge of interest and flow in Children[5]. Thus, fun makes a flow or a similar psychology state. The following hypothesis can be proposed;

H13: Emotional Fun will have a positive effect to Flow.

H14: Cognitive Fun will have a positive effect to Flow.

H15: Social Fun will have a positive effect to Flow.

4. Data Analysis and Results

4.1 Measurement Model

This paper attempts to verify the hypothesis empirically by constructing a questionnaire to verify each factor. The verification of the study model is performed using the PLS8. PLS has a flexible sample size and residual distribution relatively[3] and can evaluate the theoretical structural model and measurement model at the same time[28]. In addition, PLS can analyze model containing formative indicators and is a suitable method for the research to develop a theory which is not verified yet[25]. We adopted PLS because the characteristic of our research is close to exploratory research.

Internal consistency, convergent validity and discriminant validity are required for the analysis of PLS. Internal consistency is verified by the composite reliability[9]. This model has the CR (Composite Reliability) as the reference value (0.7) as claimed by Nunnally[21] and Thompson[26]. And the model also has the AVE (Average Variance Extracted) value over 0.5 as the reference value as suggested by

Table 3. The verification of Internal consistency, convergent validity and discriminant validity

	CR	AVE	Leader-board	Challenges	Level	Engagement	Emotional Fun	Cognitive Fun	Social Fun	Flow
Leaderboard	0.893	0.736	0.858							
Challenges	0.914	0.640	0.547	0.800						
Level	0.909	0.769	0.562	0.603	0.877					
Engagement	0.928	0.812	0.503	0.591	0.453	0.901				
Emotional Fun	0.775	0.633	0.488	0.473	0.504	0.445	0.795			
Cognitive Fun	0.901	0.752	0.293	0.399	0.479	0.481	0.471	0.867		
Social Fun	0.861	0.674	0.483	0.566	0.465	0.645	0.328	0.483	0.821	
Flow	0.870	0.769	0.427	0.565	0.585	0.546	0.571	0.483	0.472	0.877

Fornell & Larcker[9] and Chin[3,9]. Therefore, this model has high level internal consistency. Convergent validity is verified by factor loading as using bootstrap of PLS. Factor loading is encouraged over 0.79. All factors in this model have the value over 0.7. Thus, this model has convergent validity. PLS is required a confirmatory factor analysis rather than exploratory factor analysis[11]. Discriminant validity is verified whether a square value of AVE is bigger than a correlation coefficient which is marked diagonally in Table 3[9]. In this model, the smallest value of all square value of AVE (0.795) is bigger than the largest value of all correlation coefficient (0.645). Therefore, this model also has discriminant validity. As described above, the model is suitable for the analysis through verifying internal consistency, convergent validity, and discriminant validity.

4.2 Structural Model

In PLS analysis, structural model can be explained by R square which means explained variance[4]. As a result, each game element can explain 35.1% of emotional fun, 32.3% of cognitive fun and 48.5% of social fun. Each type of fun can explain 43.5% of 'flow'. These are suitable because all of this exceeds 10% presented by Falk & Miller[7]. According to the Goodness-of-Fit (GoF) in PLS[28], the

GoF in this case is 0.536. This is greater than 'large' (over 0.36) which is presented by Wetzels[27]. Thus, the overall suitability of this model can consider high. In sequence, the significance of path coefficients is verified. In case of game elements, all hypotheses are accepted except H2 and H5, whereas all hypotheses are accepted in case of types of fun. Table 4 shows the result of verifying the hypothesis.
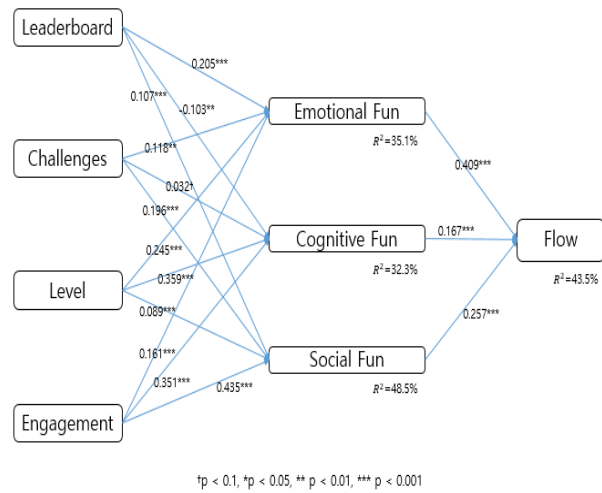

Figure 2. The result of path coefficients analysis.

Table 4. The result of verifying hypothesis

Hypothesis	Path	Path coefficients	t	Result
H1	Leaderboard → Emotional Fun	0.205	4.438	Accepted
H2	Leaderboard → Cognitive Fun	-0.103	2.240	Rejected
H3	Leaderboard → Social Fun	0.107	2.914	Accepted
H4	Challenges → Emotional Fun	0.118	2.504	Accepted
H5	Challenges → Cognitive Fun	0.032	0.693	Rejected
H6	Challenges → Social Fun	0.196	4.467	Accepted
H7	Level → Emotional Fun	0.245	4.923	Accepted
H8	Level → Cognitive Fun	0.359	7.394	Accepted
H9	Level → Social Fun	0.089	2.587	Accepted
H10	Engagement → Emotional Fun	0.161	3.515	Accepted
H11	Engagement → Cognitive Fun	0.351	8.066	Accepted
H12	Engagement → Social Fun	0.435	11.149	Accepted
H13	Emotional Fun → Flow	0.409	9.020	Accepted
H14	Cognitive Fun → Flow	0.167	3.557	Accepted
H15	Social Fun → Flow	0.257	6.855	Accepted

5. Discussions and Conclusion

The accepted hypotheses for this study are as follows: Theoretical significance and empirical Significance. In theoretical significance, this research confirms the role of fun to apply the gamification for feel flow more easily. The previous studies explained the relationship of game elements and flow without consideration of fun. However, we considered that fun is key elements to induce flow. The research model presented the most effective type of fun for flow and the most effective game elements inducing fun.

In empirical significance, this paper presented a theoretical framework how the developers make contents to apply the gamification for feeling 'flow' more easily. At first, the most effective type of fun to affect flow is emotional fun. This means that user can play the content a long time as using game elements for emotional fun when gamification is applied. 'Level' and 'Leaderboard' are more effective to induce emotional fun. In regard to the 'level', when high level is achieved, a user feels novelty with emotional arousal. In other words, a user has a new experience whenever the user's level is raised. It induces the 'flow'. Leaderboard also gives the novelty when user can check their performance and whether their performance is broken by others. However, it must be cautious that if you highlight the leaderboard to raise emotional fun, cognitive fun is decreased. In other words, developers can apply 'leaderboard' according to what you highlight type of 'fun'. The result can be applied not only marketing in business but also education program and disaster simulation. It is already verified that 'fun' has the effect in education. In case of disaster simulation, it can be made that more effective and interesting contents as applying virtual augmented reality using the device like Oculus. This will help user can learn the action easier in emergency situation. In conclusion, it will be expected that the learning is easier and fun as applying the result of this paper can be applied.

This research has the limitations in its nature and the directions for further study are proposed. First, it has the limitation about participants' age. As most of the game customers are usually in the twenties, it is hard to generalize because gamification using game elements targets not only twenties but also all ages. If the sample for survey expands to various ages and is applied to this research model, the more various and meaningful results would be expected. Second, a meaningful result will vary according to user's characteristics. Usually, the player of the game can be distinguished by how he or she enjoys the game. It can apply to gamification. Lastly, it has the limitation about areas that gamification will be applied. This paper analyzed the effect of game elements which are universally used in game arena. However, when it comes to applying gamification into business, the game elements possibly have the different effects depending on the nature of the business. We will, therefore, conduct the case studies for different business areas, which perhaps provide more meaningful results and contribute to measuring the flow status of users who use the game contents.

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