



Empirical Evaluation of Game Components Based on Learning Theory: A Preliminary Study

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◆ Background

- Gamification is a technique that applies game factors to non-games fields (Deterding, Sicart, Nacke, O’Hara, & Dixon, 2011).
- Gamification has been applied to many fields and shown to be effective (Koo & Lee, 2017; Chung, Hong, & Park, 2017).
- Therefore, identifying game factors that make people engage in games has gained significant implications in gamification, especially in many social and personal important areas such as healthcare and education.
- The purpose of this study was to investigate the differences between high ranking and low ranking mobile Roll Playing Game (RPG) in antecedents, rewards and natural reward factors generated from learning theory.

◆ Method

- Participants
 - 450 female/male adults, aged 20 to 49 years
- Measures
 - **Questionnaire for Identifying Game Components (Now called Scale for Game Structure; SGS)(Chung, Kim, Ahn, Kim, Lee, & Lee, in preparation)**
 - : a 46-items questionnaire for antecedents, rewards and natural reward factors in mobile online games.
- Mobile RPG selection criteria
 - The criteria used to select high ranking mobile RPG is as follows:
 - 1) From 2014 to 2018, mobile RPG whose maintenance days of first rank in downloads are longer than mean days of all mobile RPG that have ever won the first rank in downloads
 - 2) In the list of 1), 5 RPGs whose rank in avenue is highest and maintenance days are longest
 - The criteria used to select low ranking mobile RPG is as follows:
 - 1) From 2014 to 2018, mobile RPG whose maintenance days of first rank in downloads are shorter than mean days of all mobile RPG that have ever won the first rank in downloads
 - 2) In the list of 1) games, 5 games whose rank in avenue is lowest and maintenance days are shortest
- Data Analysis
 - Independent samples t-test was conducted using SPSS 25.0 ver.
 - The analysis was used to investigate difference in 3 factors between high ranking mobile RPG and low ranking mobile RPG.

◆ Results

- The results showed significant differences in 3 factors between high ranking mobile RPG and low ranking mobile RPG
- There were differences in 1 factor of natural reward, 7 factors of reward system and 8 factors of antecedent system.

Table 1. Differences in factors of operant conditioning between high ranking and low ranking RPG

* $p < .05$ ** $p < .01$ *** $p < .001$					
		High ranking	Low ranking	t	p
Natural Reward	Negative Reinforcement Experience	3.53(1.01)	3.24(.98)	2.00	.047*
	Reward				
	Variety of Rewards	3.22(.80)	2.89(.86)	2.73	.007**
	Negative Reinforcement	3.01(.93)	2.65(.90)	2.77	.006**
	Positive Punishment	3.01(.92)	2.69(.92)	2.44	.015*
	Negative Punishment	2.83(.99)	2.42(1.01)	2.82	.005**
	Non-Contingent Positive Reinforcement	2.88(.89)	2.61(.90)	2.13	.034*
	Fixed Interval Reinforcement Schedule	3.21(.94)	2.68(.88)	4.06	.000***
	Variable Interval Reinforcement Schedule	2.93(.86)	2.61(.95)	2.51	.013*
Antecedent	Character Customization	3.39(1.07)	2.63(1.21)	4.71	.000***
	Item/Skill Customization	3.19(.97)	2.79(1.18)	2.46	.009**
	Options of Player Mode	3.21(.94)	2.39(1.14)	5.65	.000***
	Building a Team	3.22(.93)	2.49(1.15)	5.04	.000***
	User Influence/Dominance	3.21(1.01)	2.35(1.17)	5.57	.000***
	Suitability in Graphic	3.73(.87)	3.39(1.06)	2.46	.015*
	Problem Solving Events	3.05(.76)	2.65(1.04)	3.21	.002**
	Ease of Use	3.36(.74)	3.07(.96)	2.47	.014*
	Sense of Belonging	3.23(.95)	2.46(1.12)	5.25	.000***
	User Friendly UI/UX	3.43(.85)	3.13(1.01)	2.31	.022*

◆ Discussion

- High ranking RPGs have more factors of operant conditioning than low ranking RPGs especially in reward and antecedent factors.
- It means that the factors from learning theory in mobile games affect game user experience and success of game in the market.
- However, the factors from learning theory in mobile games had been self-reported by QIGC, it is possible that it doesn’t match the real system of the mobile RPG. And, there was no comparison of other genres of mobile games in this study. It means that it is not known whether the results of this study also correspond to other genres of games.
- Follow-up studies are recommended to investigate 3 factors from learning theory in various mobile game genre such as Arcade, Action and Puzzle. It is also necessary to analyze the game’s real system with game developers and experts from the perspective of learning theory rather than relying solely on user’s self-reporting for systematic gamification.

□ References

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