A Study on the Relationship between Motivation for Gaming and Creativity in Students who Major in Video Games Development or Design

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INTRODUCTION

In recent years, the situation surrounding gaming is exceptionally dynamic. Increasing smartphone penetration has allowed many people to quickly come into contact with games than ever before (SEGA Games Game Style Research Lab, 2017). Many studies have been conducted on both the good and bad effects of games (Jackson et al., 2012; World Health Organization, 2018). However, rather than just considering games on the two axes, good and bad, it is essential to find how game engineers and programmers should be trained to take advantage of the merits of gaming. A significant advantage of games is that they can cultivate creativity (Sicart, 2014). Cultivating creativity through games is expected to become even more critical in the future, and it is imperative to consider how relevant classes should be conducted in this regard. At the same time, Csikszentmihalyi (1990) states that by doing what they like, they enter the flow state, and the creator can work for a long time without frustration. And much research on creativity has been published, and it is evident that creativity is related to various factors and elements (Amabile, 1983; Shigemasu et al., 1993; Yokoyama, 2010).

On the other hand, several studies focusing on game usage and satisfaction have been administered (Sherry et al., 2006). Hence, to build a study of game users, Iguchi

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investigated the satisfaction of gaming among Japanese university students and revealed that there are seven factors (Iguchi, 2013). However, while creativity may increase when students engage in something they like, creativity may vary depending on how they engage with the game, their motivation for using it, and how satisfied they are with it. But we have not seen any previous studies on the relationship between game motivation and creativity of students who specialize in games considered to be game lovers. In this study, to clarify the above problem, we use an Iguchi's scale. Moreover, based on Iguchi's seven factors and prior research on creativity, we establish the hypothesis that "fantasy," "recognition," "achievement," "friendship," and "study" are related to creativity (Shigemasu et al., 1993; Yokoyama, 2010). In this study, we investigate the motivation for gaming and the creativity of students who major in video game development or design.

OVERVIEW OF THE SURVEY AND METHODS

Survey Targets and Survey Procedure

We surveyed second-year college students on a video game development course in Japan. In October 2019, we conducted a survey during the progression of the course subject to investigate the target sample size. In the survey, responses were obtained from 77 people (72 men, 5 women, average age: 19.7 years, S.D. 0.75). The effective response rate was 100.0%. The duration of the survey was around 15 minutes.

Measurement Scales

For the measurement scales, 7 factors and 27 items were prepared to determine the use and satisfaction of a game (Iguchi, 2013). Moreover, 32 items of the creativity scale (Munzert, 1980) were prepared to measure creativity. Besides, to examine whether a student likes the game, we prepared the item "Do you like games?". In all cases, we measured them using 5-point Likert-scale (5: Strongly Agree, 4: Agree, 3. Undecided, 2: Disagree, 1: Strongly Disagree).

Analysis of Procedure

Game uses and satisfactions, and creativity were tabulated, and the correlations were obtained. Next, an upper group and lower group were established based on the mean value for each item of game use and satisfaction, and analysis was carried out on whether or not there was a difference in creativity between the upper group and the lower group using an unpaired *t*-test.

RESULTS AND DISCUSSION

Descriptive Statistics

Whether a student likes the game

In the question "Do you like games?", the average was 4.60, and the standard deviation was 0.89, so the ceiling effect was observed. Therefore, almost all the subjects of this study satisfied the precondition that they like games.

Game uses and satisfactions, and creativity

Table 1 shows the results of a simple tabulation of game uses and satisfactions, and creativity. "Friendship" had a ceiling effect.

	Mean	*S.D.*
Fantasy	4.14	0.77
Recognition	3.22	0.95
Preference	3.59	0.94
Achievement	4.06	0.87
Friendship	4.22	0.93
Study	3.73	0.98
Diversion	3.59	0.97
Creativity	104.62	19.64
		(*n*=77)

Table 1: Game uses and satisfactions, and creativity

Correlations of Items

Table 2 shows the correlation between game uses and satisfactions, and creativity. "Preference" and "diversion" are weakly associated or uncorrelated with other items and can be considered as independent factors.

	Recognition	*Preference*	*Achievement*	*Friendship*	*Study*	*Diversion*	*Creativity*
Fantasy	.31**	.26**	.58**	.17	.55**	.07	.32**
Recognition	---	.02	.48**	.38**	.33**	.19	.53**
Preference	---	---	.31**	.06	.26*	-.13	.06
Achievement	---	---	---	.36**	.58**	-.06	.36**
Friendship	---	---	---	---	.50**	-.08	.34**
Study	---	---	---	---	---	-.04	.52**
Diversion	---	---	---	---	---	---	-.04
$^{**}p < .01, ^{*}p < .05$							(*n*=77)

Table 2: Correlation coefficients between each factor

Relationship between game uses and satisfactions, and creativity

To understand the relationship between how to tackle gaming and creativity, we established an upper group and lower group based on the mean values and performed an unpaired *t*-test on whether there was a difference in creativity between groups. As a result, the mean value for the creativity of the upper groups for "fantasy," "approval," "friendship," "study," and "achievement" was significantly higher.

From Table 2 and 3, this result supported the hypothesis of this study. It may be useful to incorporate the use and practice of game materials that raise awareness concerning "fantasy," "approval," "achievement," "friendship," and "study." These results suggest that it is also possible to apply the results of prior research to identify factors and items related to creativity and better understand the relationship between game usage and creativity.

FUTURE WORKS

In the future, it may be important to conduct wide-ranging research to improve the capacity building processes found within game engineering education, but also gaming and creativity in general, by examining the relationship between genres and creativity, and by examining how the motivation for using games for general students is related to creativity.

		n	Creativity		t-value
			Mean	S.D.	
Fantasy	*Upper*	49	109.55	19.54	$t(75)=3.06$ **
	Lower	28	96.00	16.32	
Recognition	*Upper*	38	115.37	17.43	$t(75)=5.59$ **
	Lower	39	94.15	15.39	
Preference	*Upper*	43	104.14	20.11	$t(75)=-0.24$
	Lower	34	105.24	18.81	
Achievement	*Upper*	39	110.03	19.94	$t(75)=2.53$ *
	Lower	38	99.08	17.50	
Friendship	*Upper*	47	109.17	18.48	$t(75)=2.63$ *
	Lower	30	97.50	19.06	
Study	*Upper*	40	112.60	19.74	$t(75)=4.06$ **
	Lower	37	96.00	15.22	
Diversion	*Upper*	45	105.76	16.54	$t_{welch}(52.69)=0.56$
	Lower	32	103.03	23.05	

$^{**}p<.01$, $^{*}p<.05$ ($n=77$)

Table 3: Relationship between each factor

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