Research on the Influence of Gamification Affordance on Consumers' Willingness to Continue to Participate

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ABSTRACT
Based on self-determination theory, this study empirically studies the mechanism of gamification affordance in virtual corporate social responsibility (CSR) activities affecting consumers' willingness to continue to participate. There is a significant positive impact; the second is that gamification affordance affects consumers' willingness to continue to participate through the mediating effect of flow experience.

Keywords: *Gamification Affordance, Self-Determination Theory, Flow Experience, Willingness to Continue to Participate*

1. INTRODUCTION

According to the data from the Survey Report on Chinese Public's Views on Public Welfare, with the emergence of the "Internet + public welfare" effect, the Internet platform has become an important way for the public to participate in public welfare undertakings [14]. Since Alipay launched the Ant Forest project in 2016, its users have exceeded 550 million, a total of 223 million trees have been planted, and a cumulative carbon emission reduction of 12 million tons has been achieved. Alipay invites consumers to participate in online CSR activities, creating huge social value. Academically, this phenomenon is called virtual CSR co-creation, which means that companies strategically use social media technology to actively attract stakeholders to participate in CSR activities [16].

Although virtual CSR co-creation has made great achievements in practice, a lot of academic research still focuses on offline CSR activities, and scholars have not done much research on virtual CSR co-creation [9]. In addition, in the online CSR activities with consumers as the core, some enterprises will inevitably face problems such as high cost, low user responsiveness and low user stickiness [16]. Based on gamification-related theories and flow theory, this paper selects gamification affordance as an independent variable to construct the research model of this paper, and explores the influence mechanism of gamification affordance on consumers' willingness to continue to participate in virtual CSR activities.

2. LITERATURE REVIEW

2.1 Gamification Affordance

Possibilities refer to the possibility of actions that things can fulfill consumer needs or behaviors [8]. Gamification affordance refers to the consumer's perceived possibility of completing actions or functions through the use of gamified information systems [23]. According to the classification of gamification elements by Aparicio et al., this study divides the gamification affordance into gamification affordance of autonomy, gamification affordance of achievement and gamification affordance of interactivity [1].

Gamification Affordance of Autonomy: Self-determination theory believes that satisfying consumers' autonomous psychological needs is one of the important reasons for improving consumers' intrinsic motivation [5]. Autonomy is the need for a consistent sense of self-activity and self-integrity, emphasizing a sense of control [2] [21]. Gamification affordance of autonomy refers to the possibility that consumers can make their own decisions.

Gamification Affordance of Achievement: In the gamification scenario, the specific performance of achievement is to quantify the staged results (game progress, etc.) and final results of consumers. This will greatly increase the enthusiasm of consumers to continue to participate [8]. In this study, gamification affordance of achievement refers to the possibility that consumers

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can display achievements through leaderboards, trophies, etc.

Gamification Affordance of Interactivity: Finding and building social relationships is an inherent characteristic of human beings [18]. Therefore, some scholars propose that interactive elements should be added when designing gamification projects, such as game dialogue, game-based human-human interaction, etc. [6]. Gamification affordance of interactivity refers to the possibility of interaction between consumers. Consumers who participate in gamified information systems and even online games hope to gain not only the play experience, but also social relationships [17]. Consumers' sense of social connection in games is also stimulated when the importance of consumer behaviors to organizational performance is emphasized (Sailer et al., 2013) [20].

Since the research on the concept of gamification affordance is in its infancy, and the relevant empirical research is still relatively scarce, this study starts from the perspective of affordance theory and further divides the dimensions of gamification affordance.

2.2 Flow Experience

Flow refers to the overall feeling that people experience when they are fully engaged in an activity [4]. The flow experience is a special state. When people are in this state, their attention is highly concentrated, time flies, and a sense of pleasure occurs. Hoffman believes that the flow experience is a unidimensional variable with many antecedent and outcome variables [11]. Csikszentmihalyi believes that the flow experience has nine dimensions, namely clear goal, focus, matching skills and challenges, potential sense of control, fusion of action perception, time distortion, purposeful self-experience, timely feedback and self-awareness lost [3]. This paper follows Hoffman's point of view and believes that flow experience is a unidimensional variable.

In the process of studying MOOC learning, Mulik et al. found that the flow experience positively affects the satisfaction of consumers when participating in the course, and improves consumers' recognition of the MOOC platform [22]. Gamification can make consumers immersed in the process of participating in activities and generate a sense of pleasure.

By combing the related literature of flow experience, it is found that the theory of flow experience has gradually expanded from the field of psychology to the field of virtual user network behavior, but the research of flow experience theory in this field still needs to be further explored. The field of virtual CSR co-creation is an emerging research field that has gradually started in recent years, and the research on flow experience theory in this field is still relatively scarce. The flow experience is an autotelic experience, that is, the flow experience itself can become an internal motivation to motivate people to repeatedly participate in an activity, and can explain the psychological mechanism of consumers' continuous participation in virtual CSR co-creation activities.

3. RESEARCH HYPOTHESIS

3.1 Influence of Gamification Affordance on Consumers' Willingness to Continue to Participate

Self-determination theory believes that human beings have three basic psychological needs, namely, autonomy needs, belonging needs and ability needs [5]. Autonomy needs refer to the individual's need to have a sense of autonomous choice in various activities, rather than being controlled by others; belonging needs refer to the individual's need to keep in touch with others; competency needs refer to the individual's feelings when engaging in various activities. Competent needs.

The satisfaction of autonomous needs has a positive impact on consumers' intrinsic motivation to use [5]. In the gamification scenario, satisfying consumers' autonomous needs is usually to provide consumers with choices. Consumers can make autonomous decisions based on their own preferences and judgments based on the information they have at their disposal, so that consumers perceive the gamification affordance of autonomy of CSR projects. There are various forms of CSR projects. Consumers can choose which projects to participate in and when to participate, so as to meet consumers' independent needs and improve consumers' willingness to continue to participate. When consumers participate in CSR projects, they can connect with other consumers and jointly promote the process of activities. In this process, consumers' belonging needs are met, and consumers can perceive the gamification affordance of interactivity of CSR projects. The company's virtual CSR project design includes leaderboards, badges, etc., so that consumers can know the progress of their activities at any time, clarify their contributions to the activities, and meet the competent needs of consumers. Therefore, according to the theory of self-determination, when consumers participate in virtual CSR projects, they can satisfy their own three basic psychological needs and improve consumers' willingness to continue to participate in CSR projects. Du et al.(2020) [7] found that the autonomous support, achievement visibility, competitiveness and interactivity provided by gameplay affect the satisfaction of consumers'related needs in order to promote the continuous use of information systems or enhance consumer participation. Huang et al.(2020) [12] found that social g gamification affordance (interaction, cooperation and competition) has a positive impact on cognition, which in turn has a positive impact on the willingness to use green information system services. This makes the assumption that:

Hypothesis1 Gamification affordance has a positive effect on consumers' willingness to continue to participate.

Hypothesis1a Gamification affordance of autonomy has a positive impact on consumers' willingness to continue to participate;

Hypothesis1b Gamification affordance of achievement has a positive effect on consumers' willingness to continue to participate;

Hypothesis1c Gamification affordance of interactivity has a positive impact on consumers' willingness to continue to participate.

3.2 The Mediating Role of Flow Experience

Kim et al. found that when consumers' sense of autonomy decreases, their hedonic experience of games also decreases [15]. The flow experience is a special state in which an individual ignores the passage of time and produces a sense of pleasure when he is fully absorbed in it. Therefore, this negatively shows that in the gamification situation, the higher the degree of gamification affordance of autonomy perceived by consumers, the better the flow experience. The degree is also higher. When consumers participate in a company's CSR projects, they naturally interact with other consumers and CSR issues [9]. The satisfaction of individual basic psychological needs can improve happiness [5]. Gamified interactions can enhance consumers' perceived enjoyment of communicating with friends [19]. Therefore, the higher the level of gamification affordance of interactivity perceived by consumers in the game, the more fun they perceive, and the higher the degree of flow experience. Competency needs refer to the needs of individuals who are motivated to be competent when engaging in various activities. Improving the consumer's perception of gamification affordance of achievement is an effective means to bring gamification experience to consumers, and it can improve the intrinsic motivation of consumers to continue to participate [13]. Consumers can not only see their own task progress, but also the task progress of other consumers, and this kind of social comparison can improve consumers' hedonic experience [10]. Therefore, the higher the level of gamification affordance of achievement perceived by consumers, the higher the level of flow experience they perceive. Gamification can enrich consumers' participation in virtual CSR activities, make consumers feel a higher sense of pleasure, and then promote consumers' willingness to continue to participate.

Based on the above discussion, this paper proposes the following assumptions:

Hypothesis2 Flow experience mediates the relationship between gamification affordance and consumers' continued willingness to use.

Hypothesis2a Flow experience plays a mediating role between gamification affordance of autonomy and consumers' continual use intention;

Hypothesis2b Flow experience plays a mediating role between gamification affordance of achievement and consumers' willingness to continue to participate;

Hypothesis2c Flow experience plays a mediating role between gamification affordance of interactivity and consumers' willingness to continue to participate.

Based on flow theory and self-determination theory, this paper takes the corresponding gamification affordance of the selected three types of gamification elements as an antecedent variable, the flow experience as a mediating variable, and the consumer's willingness to continue participating as an outcome variable. The research model of this paper is constructed according to the path of " gamification affordance -flow experience-consumers' willingness to continue to participate". As shown in Figure 1.

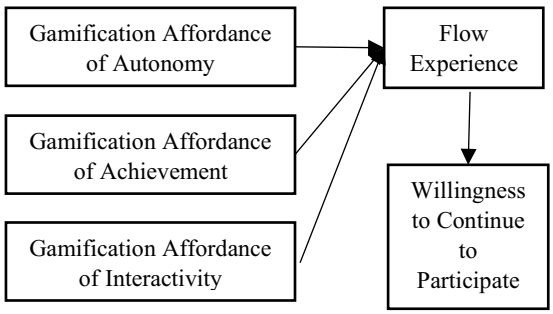

Figure1.Research model

4. DATA ANALYSIS

4.1 Issuance and Recovery of Formal Questionnaires

Questionnaires are distributed and collected online in this study, and the survey objects are groups who have participated in online CSR activities. Find target survey groups from groups such as friends and classmates around you, and spread them in a snowball manner. A total of 361 questionnaires were distributed, of which 315 were valid questionnaires, with an effective rate of 87.26%. Among them, the gender ratio (male 40.13%, female 59.87%) differs by nearly 20%; in terms of age distribution, the most people are 19-30 years old, accounting for 84.64%, followed by those under 18 years old, and those over 30 years old. The least.

4.2 Reliability Test

In the pre-investigation stage, this study used Cronbach's alpha value and CITC value to test the reliability of the scale, and retained the variable items in the scale used in this study. In the formal investigation stage, only Cronbach's alpha value is needed for

reliability analysis. The standard of reference for the results is: Cronbach's alpha value>0.7 indicates that the scale reliability is good, and 0.6<Cronbach's alpha value<0.7 indicates that the scale reliability is acceptable. In this study, SPSS26.0 was used for reliability analysis, and the Cronbach's α value of each variable of the scale was >0.7, indicating that the reliability of the scale was good.

4.3 Validity Test

In this study, SPSS26.0 was used to perform KMO test and Bartlett sphericity test on the scales of each variable. The KMO values of gamification affordance (0.891), flow experience (0.831), and willingness to continue participating (0.759) were all >0.7, and the Bartlett sphericity test was all significant, indicating that it is suitable for confirmatory factor analysis.

In this study, AMOS23.0 was used for confirmatory factor analysis of each variable scale. The construct validity of each variable is shown in Table 1.

Table 1. Overall Model Fitness Index Result Table (N=315)

CMIN/DF	NFI	CFI	IFI	TLI	RMSEA
2.343	0.919	0.952	0.952	0.943	0.065

It can be seen from Table 1 that the value of CMIN/DF of the overall model is 2.343 (<3), which is a good fit; NFI, CFI, and TLI are all greater than 0.9; RMSEA<0.08. It shows that the model fit is good. The normalized path coefficients of the latent variables corresponding to each item ranged from 0.50 to 0.95, and were significant at the level of p<0.001. In addition, the combined reliability of each variable is greater than 0.5, that is, the combined reliability of the measurement items is good; the value of each variable AVE is greater than 0.6, indicating that the measurement items have good convergent validity. In conclusion, the overall model has passed the confirmatory factor analysis, and the scale has good reliability and validity.

4.4 Hypothesis Testing

Build a structural equation model of independent, mediator, and dependent variables. The specific model suitability indicators are shown in Table 2. The value of CMIN/DF is 2.875 (<3), indicating a good fit; NFI, CFI, IFI, and TLI are all greater than 0.9; RMSEA<0.08. It shows that the model fit is good, and the path analysis of the model is shown in Table 3.

Table 2. Results of Model Fit Indicators of Independent Variables, Mediators and Dependent Variables (N=315)

CMIN/DF	NFI	CFI	IFI	TLI	RMSEA
2.875	0.919	0.945	0.945	0.933	0.077

It can be seen from Table 3 that the path coefficient value of flow experience on continuous participation willingness is 0.430 (positive number), and the C.R. value or t value is 6.490 (>1.96), which indicates that flow experience has a significant positive effect on continuous participation willingness. In this model, the independent variables (gamification affordance of autonomy, gamification affordance of achievement and gamification affordance of interactivity) have significant influence on the dependent variable.

Table 3. Factor Loading Result Table of Each Path of SEM of Independent Variable, Mediator and Dependent Variable (N=315)

path	normalized path coefficients	C.R.	p-value
Gamification Affordance of Autonomy→ Flow Experience	0.184	2.565	**
Gamification Affordance of Achievement→Flow Experience	0.441	6.336	***
Gamification Affordance of Interactivity →Flow Experience	0.201	2.927	**
Gamification Affordance of Autonomy→ Willingness to Continue to Participate	0.153	2.330	**
Gamification Affordance of Achievement→Willingness to Continue to Participate	0.176	2.568	**
Gamification Affordance of Interactivity →Willingness to Continue to Participate	0.168	2.655	**
Flow Experience→Willingness to Continue to Participate	0.430	6.490	***

Note: *** means p<0.001, ** means p<0.05.

In order to clarify the mediating effect of each path in the process of gamification affordance to influence consumers' willingness to continue to participate through the flow experience, this study uses the Bootstrap method in AMOS23.0 to analyze the mediating effect. The results are shown in Table 4.

Table 4. Bootstrap Mediation Effect Analysis Results (N=315)

path	Effect size	BC95% confidence interval	
		lower limit	upper limit
Gamification Affordance of Autonomy→Willingness to Continue to Participate	0.194	0.026	0.384
Gamification Affordance of Autonomy→Flow Experience→Willingness to Continue to Participate	0.100	0.023	0.224
Gamification Affordance of Achievement→Willingness to Continue to Participate	0.162	0.006	0.326
Gamification Affordance of Achievement→Flow Experience→Willingness to Continue to Participate	0.084	0.020	0.174
Gamification Affordance of Interactivity→Willingness to Continue to Participate	0.182	0.018	0.385
Gamification Affordance of Interactivity→Flow Experience→Willingness to Continue to Participate	0.196	0.101	0.345

Gamification affordance of autonomy. In the process of gamification affordance of autonomy affecting consumers' willingness to continue to participate through the flow experience, the bias-corrected Bootstrap confidence interval of the direct effect at the 95% confidence level is (0.026, 0.384), excluding the 0 value, that is, the direct effect is significant; the indirect effect is significant; The confidence interval for the effect is (0.023, 0.224), excluding the 0 value, that is, the indirect effect is significant. Therefore, the flow experience partially mediates the relationship between gamification affordance of autonomy and consumers' willingness to continue to participate. Gamification affordance of achievement. In the process of gamification affordance of achievement affecting consumers' willingness to continue to participate through the flow experience, the bias-corrected Bootstrap confidence interval of the direct effect at the 95% confidence level is (0.006, 0.324), excluding the 0 value, that is, the direct effect is significant; the indirect effect is significant; The confidence interval for the effect is (0.020, 0.174), excluding the 0 value, that is, the indirect effect is significant. Therefore, flow experience partially mediates the relationship between gamification affordance of achievement and consumers' willingness to continue to participate. Gamification affordance of interactivity. In the process of gamification affordance of interactivity influencing consumers' willingness to continue to participate through the flow experience, the bias-corrected Bootstrap confidence interval of the direct effect at the 95% confidence level is (0.018, 0.385), excluding the 0 value, that is, the direct effect is significant; the indirect effect is significant; The confidence interval for the effect is (0.101, 0.345), excluding the 0 value, that is, the indirect effect is significant. Therefore, flow experience plays a partial mediating role between gamification affordance of interactivity and consumers' willingness to continue to participate.

5. DISCUSSION

5.1 Main Conclusions

Based on self-determination theory, this study divides gamification affordance into gamification affordance of autonomy, gamification affordance of achievement and gamification affordance of interactivity, and through empirical evidence The study confirmed that gamification affordance has a significant positive impact on consumers' willingness to continue to participate.

Enterprises use the Internet to invite consumers to participate in online CSR activities, so that consumers can understand the significance of CSR activities in the process of participating. The gamified design allows consumers to feel delighted and immersed in the process of participating in virtual CSR activities, thereby increasing consumers' willingness to continue to participate.

5.2 Management Implications

Gamification design can increase consumers' continued participation in virtual CSR activities initiated by companies. In the field of CSR, most companies should think outside the box and regard consumers not only as the object of economic benefit exchange, but also as one of the important sources for enterprises to create social value, and encourage consumers to participate in it through reasonable and effective strategies. Doing so can not only reduce the "weakness" of enterprises in CSR project innovation and the cost of publicity to a certain extent, but also allow consumers to become the real "leaders" of CSR activities and maximize their "self-role" as much as possible. play, which will help to change their willingness to participate. For planners of virtual CSR activities, gamification design is a very worthy design factor and should be taken seriously. And think about why consumers are willing to participate in virtual CSR activities, and when designing activities, companies

should consider which gamification elements can bring corresponding psychological benefits to consumers.

5.3 Study Limitations

The limitations of this study are: First, it only focuses on the variable of flow experience, and does not consider the public welfare attributes of virtual CSR co-creation activities. Future research may consider combining other features of virtual CSR co-creation with gamification affordance. Explore the mechanism of action between gamification affordance and consumers' willingness to continue to participate, so as to have a more comprehensive understanding of the role path of the two, and improve the theoretical system of virtual CSR co-creation; second, due to the limitation of the research scale, the effectiveness of this study is; second, the number of research samples is 315, and the effective sample size is slightly smaller. Future research can further expand the scale of data collection and conduct more comprehensive data collection work.

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