

Association for Information Systems

AIS Electronic Library (AISeL)

WHICEB 2020 Proceedings

Wuhan International Conference on e-Business

Summer 7-5-2020

No Fun no Use? The Impact of Gamification on User's Continuous Usage Intention toward E-Business App

Wenhu Liao

School of management, Wuhan Institute of Technology,China, 403142543@qq.com

Yu Liu

College of foreign languages,Wuhan Institute of Technology,China

Hui Qiao

School of management, Wuhan Institute of Technology,China

Follow this and additional works at: <https://aisel.aisnet.org/whiceb2020>

Recommended Citation

Liao, Wenhu; Liu, Yu; and Qiao, Hui, "No Fun no Use? The Impact of Gamification on User's Continuous Usage Intention toward E-Business App" (2020). *WHICEB 2020 Proceedings*. 74.

<https://aisel.aisnet.org/whiceb2020/74>

This material is brought to you by the Wuhan International Conference on e-Business at AIS Electronic Library (AISeL). It has been accepted for inclusion in WHICEB 2020 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

No Fun no Use? The Impact of Gamification on User's Continuous Usage Intention toward E-Business App

Wenhu Liao^a, Yu Liu^{b*}, Hui Qiao^a

^a School of management, Wuhan Institute of Technology, China

^b College of foreign languages, Wuhan Institute of Technology, China

Abstract: Gamification as an internal incentive method has been widely adopted in practice. Compared with the traditional external rewards, internal rewards can stimulate the enthusiasm of users. This paper, therefore, explores and constructs a model on how gamification (herein composed of three dimensions: sense of achievement, social influence and sense of ownership) affects user's continuance intention from the perspective of intrinsic motivation (herein composed of three dimensions: self-presentation, entertainment and self-efficacy). Through the multiple regression analysis of 456 e-shoppers sample data by using the software of SMARTPLS 3.0, we draw the following five conclusions: gamification was positively correlated with self-presentation, entertainment and self-efficacy; sense of achievement, social influence and sense of ownership, significantly positively affected self-presentation, entertainment and self-efficacy; there is no correlation between self-presentation and users' continuance intention; entertainment and self-efficacy are positively correlated with users' continuance intention; and entertainment and self-efficacy play a mediation role between gamification and users' continuance intention.

Keywords: gamification; self-presentation; entertainment; self-efficacy; users' continuance intention

1. LITERATURE REVIEW AND THEORETICAL CONSTRUCTION

With the rapid development of information technology and the drop of information-collecting cost, e-shoppers switch frequently among various e-business apps and reduce greatly their loyalty toward the APP. How to enhance the users' stickiness to the app and loyalty to the enterprise has been a major challenge faced by different enterprises.

Literature has shown that gamification can be used in customer relationship management. The research on gamification, at present, mainly focuses on its impact on customer's engagement and purchase intention, and on how to increase customer's participation rate and evaluation quality (Kavaliova et al., 2016). Few studies focus on its impact on customer's continuance intention and the major research methods are case studies. Based on these, this paper chooses the empirical method to study its influence on users' continuance intention from the perspective of gamification.

1.1 Gamification

Gamification originated from games. Bunchall (2010) defines it as the process of integrating the dynamics and mechanics of a game into a website, service, content or activity. Zuckerman and Gal-OZ (2014) define it as the application of game design elements to the persuasion system to encourage users to participate in activities personally. Penenberg (2015) defined it as an addiction system that uses game elements to influence non-game behaviors, which is composed of a complete set of institutions, mechanisms and rules to ensure the good operation of incentives. The above definitions of gamification were mainly studied from the perspective of system design. Zichermann and Linder (2013), whereas, defined it as the process of integrating games and

* Corresponding author.

E-mail addresses:403142543@qq.com

strategies into business from the perspective of user experience. They believe that gamification can create experiences that provide intrinsic meaning and improve employee and customer motivation. Robson et al. (2014) defined it as applying the experience in the game field to non-game environments to make the traditional organizational process more fun and bring the game experience to stakeholders. Huotari and Hamari (2017) defined it as providing better interactive services through motivational affordances, bringing game-like experience to users and realizing value creation of users.

In this paper, gamification is viewed as an incentive mode, its definition mainly refer to the Penenberg's (2015) as an addiction system that uses game elements to influence non-gaming behaviors, which is composed of a complete set of systems, mechanisms and rules to ensure the good operation of incentives.

1.1.1 The measurement of gamification

Chou (2015) devised a game framework, Octalysis Framework, basing on an octagon with eight gamification drivers without corresponding measurement scale development (e.g. Epic Meaning & Calling, Development and Accomplishment, Empowerment of Creativity, Ownership and Possession, Social Influence, Scarcity & Impatience, Unpredictability & Curiosity, Loss & Avoidance). Brito et al. (2018) developed a new gamification scale based on the research of Chou (2015), and divided it into six dimensions: achievement, avoidance, uncertainty, social influence, sense of ownership and sense of mission. Taking Alipay as an example, this paper developed the scale with reference to Chou (2015), submitted the scale to three experts in related fields for discussion, and finally chose the measurement from three aspects: development and achievement, social influence and sense of ownership. Brito et al. (2018) gave the following definitions about these three measurements:

“Development and Accomplishment is related to the sensation of progress, development of skills and achieving complex goals followed by a reward or feeling of great accomplishment.”

“Social Influence is related to activities inspired by what people think, do or say to each other, and includes all the social elements that motivate them: acceptance, competition, envy, the need not to feel excluded and companionship.”

“Ownership is associated with motivating people who are directly related to so-called “virtual goods” or “virtual currency”, the use or trade of which has become extremely popular and an important model of recipes for online services, social networks or massively multiplayer online games.”

1.1.2 Research on gamification

At present, the research on gamification in marketing mainly focuses on advertising management (Bittner and Schipper, 2014), customer management (Kavaliova et al., 2016), brand management (Harwood and Garry, 2015) and product creativity (Zimmerling et al., 2018).

In terms of advertising management, scholars mainly focus on the antecedents of in-game advertising effects, such as the matching degree between advertising types and game types (Huang and Yang, 2012), and the interaction between audiences and characters in games (Hang and Auty, 2011). In terms of customer management, scholars mainly focus on the impact of gamification on customer participation and purchase intention, which is embodied in the improvement of customer participation rate and evaluation quality by gamification (Jang et al., 2018). In terms of brand management, scholars mainly focus on the relationship between gamification and brand fit, which is embodied in the influence of gamification on consumers' brand cognition (Hsu et al., 2018) and the influence of gamification on brand fit (Gatautis et al., 2016b). In terms of product creativity, scholars have found that game elements can improve quantization performance, but not the quality of participants' motivation or ideas (Zimmerling et al., 2018).

To sum up, the research on gamification mainly focuses on advertising, customer, brand management and product creativity in the marketing field. The research methods are mainly case studies and statements, with few

empirical studies. The theories adopted are mainly self-determination theory and flow theory, with a lack of research on Continuous Usage intention.

1.2 Research on continuous participation behavior

In the field of continuous participation behavioral research, the expectancy confirmation theory (ECT) proposed by Oliver (1980) is the most typical theory to explore consumer behavior. Bhattacharjee (2001) proposed a post-acceptance model of IS Continuance based on the expectancy confirmation theory and argued that users' willingness to continuous participation in information systems was similar to consumers' willingness to make repeated purchases and was influenced by the initial use or purchase experience. According to the characteristics of information system, this model modifies the original expectation confirmation model to make it better explain the intention of continuous usage of information system.

Scholars Basak et al. (2015) took Facebook as the research object and showed that users' attitude and satisfaction had a significant impact on individuals' willingness to continuous usage. Hu et al. (2017) took online live video programs as the research object, and found that broadcaster identification and group identification had an impact on audiences' willingness to continue watching. Wu et al. (2018) took social network game apps as an example, and found that perceived curiosity and perceived pleasure had a significant impact on users' willingness to continuous participation. Yang et al. (2018), taking Ant Forest (a Chinese e-business app) users as examples, found that perceived persuasiveness, achievement and perceived entertainment have significant effects on users' willingness to continuous participation.

To sum up, scholars based on expectation-confirmation theory to study the continuous participation mostly from the relational perspective like the user's attitudes, satisfaction, sense of identity and so on, less from the motivation perspective to treat gamification as an incentive to study its effects on user's continuous participation behavior.

1.3 Gamification and users' intention to continuous usage

Huang et al. (2019) studied the non-continuous use of gamified apps, they found that the value of gamified apps would affect user satisfaction, and the satisfaction would affect the users' willingness to non-continuous usage. Hassan et al. (2019) studied how motivational feedback increased user's benefit and continuous usage, they found that gamification would affect continuous usage through affective feedback, social feedback and information feedback. Thongmak(2017) studied the influence of gamification on students' learning of programming courses, they found that gamification could affect the satisfaction of continuous interaction intention. Feng et al. (2018), in their studying of the effects of gamification on users' participation in crowdsourcing, found that reward points and feedback had positive effects on users' participation.

1.4 Motivational affordances

Zhang (2008) first proposed the concept of motivational affordances with regard to the positive design of information and communication technology (ICT) in human-computer interaction, and constructed a theoretical model of psychological, cognitive, social and emotional motivational affordances, and proposed corresponding design principles on this basis.

Blohm and Leimeister (2013) carried out an exploratory analysis on gamification elements with motivational affordances, and related gamification mechanisms to corresponding user motivations, including achievement, thirst for knowledge, social recognition, cognitive stimulation and self-determination. Hamari et al. (2014) provided the theoretical framework of “affordances -- psychological outcome -- behavioral outcome” based on the background of gamification. Koivisto (2017) believes that although this conceptualized theory (affordances -- psychological outcome -- behavioral outcome) is still at a relatively preliminary level, it is the most appropriate understanding of the mechanism of gamification in the academic world at an abstract level.

Based on the theory of “affordances--- psychological outcome -- behavioral outcome”, this paper studies the influence of gamification on the persistent intention of mobile business users and divides motivation into three types (Self-presentation, entertainment and self-efficacy) according to the model proposed by Zhang (2008). Self-presentation refers to an individual’s willingness and desire to express themselves to others regarding their identities (Baumeister & Hutton, 1987), Jung et al. (2007) indicates that competence/capability is an important predictor in explaining individual’s self-presentation behaviors in online settings. Entertainment refers to the extent to which the execution of a certain behavior is perceived to be personally enjoyable and fun. Point rewarding mechanism is typically utilized by online platforms to motivate individual’s intrinsic motivation to participate (Sjoklint, Constantiou, € & Trier, 2013). Self-efficacy refers to the belief in one’s capabilities to organize and execute courses of actions required to manage prospective situations (Bandura, 1997). As individuals gain more experiences in a specific domain of tasks, their self-efficacy beliefs in completing the tasks are strengthened (Eastin & LaRose, 2000).

2. ASSUMPTIONS AND MODELS

2.1 Gamification and motivations

According to the theory of psychological needs, there are three main motivations for people to participate in activities: internal motivation, external motivation and internalized motivation (Ryan and Deci, 2000). Internal motivation is the innate driving behavior of human beings, which is caused by the fun and satisfaction that the activity itself can bring to individuals. And when people's inner needs are satisfied, it is possible to drive their internal motivation to participate in activities or to achieve the internalization of external motivation. Progress and a sense of accomplishment as an internal drive, will encourage players to continue to improve and acquire new skills. And this kind of progress will not only provide the players a chance of self-efficacy and self-presentation, but also to a certain extent bring the players the sense of pleasure. Based on this, this paper proposes:

H1a: Sense of achievement has a significant positive impact on self-presentation

H2a: Sense of achievement has a significant positive effect on entertainment

H3a: Sense of achievement significantly positively affects self-efficacy

Social Influence is related to activities inspired by what people think, do or say to each other, and includes all the social elements that motivate them: acceptance, competition, envy, the need not to feel excluded and companionship.

When users find that their friends possess something that they do not have or concern something that they do not know, they may, due to curiosity and jealousy, follow suit to pay attention to the behaviors, hoping to gain recognition from their friends through self- presentation, they may actively integrate into the circle of friends, further enhance friendship. Social interaction always unconsciously affect people's various behaviors, Paying attention to the Ant Forest score ranking, is conducive to show their ability. Participating in collecting the energy of the circle of friends is conducive to strengthening friendship. Based on this, this paper proposes:

H1b: Social Influence has a significant positive impact on self-presentation

H2b: Social Influence has a significant positive influence on entertainment

H3b: Social Influence has a significant positive impact on self-efficacy

Game design often gives users a sense of mission by creating a background story for the game. For example, "Ant Forest" in Alipay is such a kind of public welfare product that Public welfare organizations, environmental protection enterprises and other Ant ecological partners can buy the user's "tree" and plant a real tree in a real area. The product can make users more willing to use Alipay as a means of payment and Taobao as an online shopping platform. According to self-determination theory, people can analyze individual behavior

from three aspects: needs for competence, connection, and autonomy. Autonomy refers to the choice and execution of specific activities by individuals according to their self-consciousness. The stronger the sense of autonomy is, the higher satisfaction individual will be and the more fully they will be self-presented. Connection refers to a sense of belonging and attachment to other people, as well as the need to be recognized by organizations and groups through a spiritual identity and pleasure. Competency is the ability of an individual to match their position. It is a subjective judgment of a person's level and ability to perform a particular action or achieve a particular outcome in the future. Based on this, this paper proposes:

H1c: sense of ownership has a significant positive effect on self-presentation

H2c: sense of ownership significantly positively affects entertainment

H3c: sense of ownership significantly positively affects self-efficacy

2.2 Self-presentation and intention to continuous usage

Ma et al. (2007) showed that in the online community environment, self-presentation has an impact on user participation. Feng et al. (2018) studied the crowdsourcing platform, and found that self-presentation had an impact on the receivers participating in the crowdsourcing platform. In addition, Deng et al. (2016) also studied the Amazon crowdsourcing platform Mechanical Turk and found that one of the main motivations for the contractor to participate in Mechanical Turk is to better demonstrate his ability and create his own influence. Similarly, users continue to participate in the use of mobile apps in order to obtain more points, higher rankings, in order to better demonstrate their abilities. Based on this, this paper proposes the following assumptions:

H4: Self-presentation significantly positively affects users' intention to continuous usage

2.3 Entertainment and users' intention to continuous usage

Bilgihan et al. (2015) found that people's behavior in the network is to achieve both practical and enjoyable needs. Lee et al. (2013) using crowdsourcing as an example, found that the contractor participated in crowdsourcing in order to experience the entertainment brought by the entire crowdsourcing process. Ye et al. (2017) found that under the crowdsourcing platform, entertainment will positively affect the willingness of the contractors to participate. Motivation theory believes that work efficiency and labor efficiency are directly related to employees' work attitudes, while work attitude depends on the degree of satisfaction and motivation factors. Users participate in the use of mobile apps in order to get more points, higher rankings, in order to get a sense of enjoyment and accomplishment from the game elements, in order to better entertain themselves. This kind of entertainment is conducive to further increasing the frequency of users and increasing intention to continuous usage. Based on this, this paper proposes the following assumptions:

H5: Entertainment is significantly positively affecting users' intention to continuous usage

2.4 Self-efficacy and users' intention to continuous usage

Self-efficacy is a belief in people's ability to accomplish and characterize their goals, and is a subjective judgment of a person's level and ability to perform a particular behavior or to achieve a particular outcome in the future. Sun et al. (2015) found that in the context of crowdsourcing platforms, when the contractor develops a high level of self-efficacy for crowdsourcing, they will believe that they have the ability to complete the task and are more willing to participate in crowdsourcing. Similarly, users continue to use of mobile apps in order to obtain more points, higher rankings, in order to better demonstrate their ability to complete tasks, and thus more willing to continue to use. Based on this, this paper proposes the following assumptions:

H6: Self-efficacy significantly positively affects users' intention to continuous usage

According to the above analysis, the mechanism model of this paper is established, as shown in Figure 1.

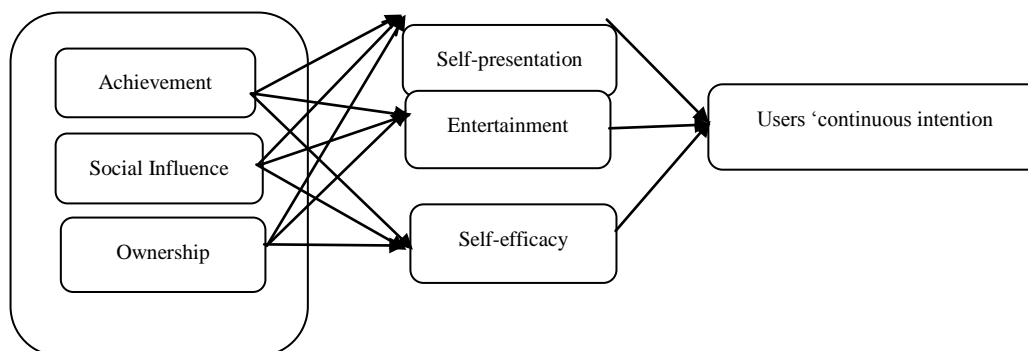


Fig. 1. The research model

3. RESEARCH METHODOLOGY

3.1 Measurement

Due to lack of mature scales, this paper develops new gamification measurement based on Chou's (2015) octagonal analysis and Brito's et al. (2018) scale. Alipay is taken as an example in the process of scale development and is submitted to experts in three related fields for discussion. Finally, the gamification is measured from three aspects: sense of accomplishment, social influence and ownership. The sense of accomplishment is tested by three items (e.g. when Alipay Ant Forest can provide me with energy points, I will actively participate in it). Social influence is formed by four items (e.g. When I use Alipay Ant Forest, I can make many friends). Ownership is composed of three items

The scales for self-expression are adapted from four items of online self-expression by Kim et al. (2012) (e.g. I want to confirm a preferred image in Alipay Ant Forest). The scales for entertainment are adapted from three items used by Wakefield et al. (2011) (e.g. Alipay Ant Forest aroused my curiosity), Self-efficacy is mainly measured with three items adapted from Feng et al. (2018) (e.g. I have full confidence in my ability to complete the tasks in the ant forest), The user's intention to continuous usage is measured by three items adapted from Wu et al. (2010) (e.g. I will actively use Alipay)

3.2 Sample and data collection

Data for this study was collected mainly from China's professional online research institutions (www.wjx.cn). The whole questionnaire takes Alipay Ant Forest as the research object and a preliminary 23 items were constructed. After the pre-test of 100 students, we add one more question "Please recall whether you have ever participated in the Alipay Ant Forest game?" in order to improve the authenticity and effectiveness of the questionnaire. A total of 500 questionnaires were collected in this questionnaire. After the removal of those incorrect data, the wrong answers, and the unanswered questionnaires, there were 456 valid ones, and the effective rate was 91.2%. Of this, 41.9% of the respondents were male and 58.1% were female; 82.2% were between the age of 18 and 34; 76.3% had at least college degree; 63.8% had monthly salary between 3000-10000 Chinese yuan; The occupation involved the students, the technical personnel, the professional, the sales personnel and so on.

4. DATA ANALYSIS AND RESULTS

4.1 The reliability test

Wu (2009) considered that $0.5 \leq \text{Cronbach's } \alpha < 0.6$ is acceptable; when $0.7 \leq \text{Cronbach's } \alpha < 0.8$, it is perfect. Except for the sense of ownership, The Cronbach value of all variables is between 0.701 and 0.8, indicating that internal consistency is acceptable (See Table 1).

Table 1. measurement and reliability

variables	items	Cronbach's α
sense of achievement	a1 when Alipay Ant Forest can provide me with energy points, I will actively participate in the Ant Forest a2 if I have a chance to grab a sapling in the virtual Forest, I will often use Alipay Ant Forest a3 when I win a complex challenge, Alipay Ant Forest will give me a Heshun reserve place(an environmental protection certificate) which offers me a sense of achievement	0.701
Social influence	b1 when I use Alipay Ant Forest, I will make many friends b2 when I use Alipay Ant Forest, it gives me a chance to show off or share my achievements b3 when I use Alipay Ant Forest, it is easier for me to talk to others and share ideas b4 when I use Alipay Ant Forest, it allows me to interact with others easily	0.784
sense of ownership	c 1 when I use Alipay Ant Forest, it helps me contribute to creating a better world c2 when I use Alipay Ant Forest, I feel particularly motivated because I can contribute to greater causes through it c3 when I use Alipay Ant Forest, I feel particularly motivated because it makes me feel as if I am the only one who has won the challenge	0.566
self-presentation	d1 I want to confirm a preferred image in Alipay Ant Forest d2 I want to show off my image in Alipay Ant Forest d3 I want to give others a preferred image in Alipay Ant Forest d4 I want to show an image of myself in Alipay Ant Forest	0.799
Entertainment	e1 Alipay Ant Forest aroused my curiosity e2 I feel attracted to Alipay Ant Forest e3 I am very happy to use Alipay Ant Forest	0.713
Self-efficacy	f1 I am confident to complete the tasks in the ant forest f2 I have professional skills to complete the tasks in the ant forest f3 I have the ability to complete the mission in the ant forest	0.749
user's intention to continuous usage	g1 I will actively use Alipay g2 I will continue to use Alipay in the future g3, I will often use Alipay in the future	0.776

4.2 Validity test

This paper carried out construction validity analysis through exploratory factor analysis, $KMO=0.945$, $p=0.000$, indicating that the data is suitable for factor analysis. The principal component method was adopted to maximize the variance by orthogonal rotation, and a total of seven factors were obtained, with a total explanation of 67.753%. From the results, the sense of achievement, social influence, sense of ownership, self-presentation, entertainment, sense of self-efficacy, and users' intention to continuous usage are all independent factors, indicating that the construction validity is good. In terms of convergence validity, Wu minglong (2017) [56] believed that when composite reliability (CR) is larger than 0.6 and average extraction

variance (AVE) is above 0.5, it would have a better convergence validity (as shown in table 2).

Table 2. Confirmatory factor analysis

factors	items	Standardized factor loading	Composite reliability (CR)	(AVE)
sense of achievement	a1	0.819	0.834	0.626
	a2	0.779		
	a3	0.774		
Social influence	b1	0.782	0.861	0.607
	b2	0.757		
	b3	0.794		
	b4	0.782		
sense of ownership	c1	0.720	0.775	0.535
	c2	0.753		
	c3	0.720		
self-presentation	d1	0.774	0.868	0.622
	d2	0.811		
	d3	0.792		
	d4	0.778		
Entertainment	e1	0.792	0.839	0.635
	e2	0.821		
	e3	0.777		
Self-efficacy	f1	0.837	0.856	0.665
	f2	0.770		
	f3	0.836		
user's intention to continuous usage	g1	0.808	0.870	0.691
	g2	0.847		
	g3	0.839		

In terms of discriminant validity, Wu (2017) believed that when the arithmetic square root of the mean extracted variance (AVE) of each factor was greater than the coefficient between it and other factors, the discriminant validity was better. (As shown in table 3)

Table 3. Discriminant validity test

	sense of achievement	Social influence	sense of ownership	self-presentation	Entertainment	Self-efficacy	intention to continuous usage
sense of achievement	0.791						
Social influence	0.418	0.779					
sense of ownership	0.623	0.676	0.731				
self-presentation	0.524	0.681	0.693	0.789			
Entertainment	0.639	0.554	0.671	0.600	0.797		

Self-efficacy	0.587	0.564	0.684	0.626	0.625	0.815	
intention to continuous usage	0.685	0.275	0.533	0.388	0.554	0.587	0.831

4.3 Common method biases

Concerning the common method bias testing, this paper, following Harman's single-factor test procedures, put all variables in one exploratory factor analysis and examined the unrotated factor solution to determine the number of factors that are necessary to account for the variance in the variables. The basic assumption of this technique is that if a substantial amount of common method variance is present, either (a) a single factor will emerge from the factor analysis or (b) one general factor will account for the majority of the covariance among the measures, we can determine the existence of serious common method biases. It was found that the explanatory power of the largest factor was 39.543 % (less than 40%), indicating that the common method bias in this model was weak.

4.4 Regression analysis

This paper mainly adopts smartpls3.0 for multiple regression analysis, and the results of hypothesis testing are shown in table 4

Table 4. Path coefficient and test results

assumption	coefficient	Standard deviation	T value	P value	Results
H1gamification—self-presentation	0.754	0.032	23.874	0.000	Supported
H1a sense of achievement - self-presentation	0.154	0.071	2.175	0.030	Supported
H1b Social influence - self-presentation	0.392	0.083	4.705	0.000	Supported
H1c sense of ownership - self-presentation	0.332	0.093	3.564	0.000	Supported
H2gamification—Entertainment	0.726	0.035	20.746	0.000	Supported
H2a sense of achievement - Entertainment	0.363	0.068	5.335	0.000	Supported
H2b Social influence - Entertainment	0.188	0.066	2.861	0.004	Supported
H2c sense of ownership - Entertainment	0.318	0.076	4.179	0.000	Supported
H3gamification—Self-efficacy	0.717	0.037	19.346	0.000	Supported
H3a sense of achievement - Self-efficacy	0.264	0.069	3.840	0.000	Supported
H3b Social influence - Self-efficacy	0.188	0.062	3.017	0.003	Supported
H3c sense of ownership - Self-efficacy	0.392	0.077	5.060	0.000	Supported
H4self-presentation - intention to continuous usage	-0.082	0.091	0.903	0.367	Not Supported
H5Entertainment—intention to continuous usage	0.336	0.088	3.802	0.000	Supported
H6Self-efficacy—intention to continuous usage	0.429	0.099	4.321	0.000	Supported

4.5 Mediation test

Referring to the mediation test procedure proposed by Zhao et al. (2010) [58], this paper first tested the coefficient a of the independent variable and the mediation variable, then the coefficient b of the mediation variable and the dependent variable. If $a*b$ was significant, there was a mediation effect, otherwise, there's no mediating effect. On this basis, the coefficient c of independent variable and dependent variable is tested. If c is significant, it is partially mediated, otherwise, it is a complete mediation. This paper mainly used smartpls3.0 for mediation testing, and the specific results are shown in table 5

Table 5. mediation test

Variable	coefficient (a*b)	Standard deviation	T Value	P Value
gamification—self-presentation—intention to continuous usage	-0.145	0.080	1.804	0.071
gamification—entertainment—intention to continuous usage	0.175	0.068	2.585	0.010
gamification—Self-efficacy—intention to continuous usage	0.250	0.075	3.333	0.001
Variable	coefficient c'	Standard deviation	T Value	P Value
gamification—intention to continuous usage	0.291	0.124	2.339	0.019

It can be concluded from Table 5 that self-presentation did not mediate between gamification and intention to continuous usage ($T = 1.804 < 1.96$, $P \text{ value} = 0.071 > 0.05$); entertainment partially mediated between gamification and intention to continuous usage ($T = 2.585 > 1.96$, $P = 0.010 < 0.05$); self-efficacy partially mediated between gamification and intention to continuous usage ($T \text{ value} = 3.333 > 1.96$, $P \text{ value} = 0.001 < 0.05$); gamification impacted intention to continuous usage ($T \text{ value} 2.393 > 1.96$, $P \text{ value} \text{ is } 0.019 < 0.05$),

5. CONCLUSION

5.1 Findings

5.1.1 Gamification and self-presentation

This study found that gamification and its three dimensions like sense of achievement, social influence and ownership were positively correlated with self-presentation. Gamification as an addictive system that uses game elements to influence non-game behavior consists of a complete set of institutions, mechanisms and rules to ensure that motivation works well. Users getting high scores and good rankings on the ant forest can display their strength and ability in front of others. The sense of achievement, social influence and ownership brought by scores and rankings will make it easier for them to present themselves to others or friends and better meet their needs.

5.1.2 Gamification and entertainment

The results indicate that gamification and its' three dimensions as the sense of achievement, social influence and ownership are positively correlated with entertainment, and have significant positive effects on entertainment. Users who use Alipay Ant Forest hope to gain score, ranking, and to join in the environmental protection activities such as planting their own seedlings in Ala Shan area(a desert area in Inner Mongolia), for the purpose of meeting their own entertainment and enjoyment wants. This is consistent with the conclusion found by scholar Bilgihan et al. (2015)that the purpose of people's behavior in the network is to achieve both practical and hedonic needs.

5.1.3 Gamification and self-efficacy

Gamification and its' three dimensions like sense of achievement, social influence and ownership are positively correlated with self-efficacy, and have significant positive effects on self-efficacy. Gamification provides people with opportunities to show their abilities, especially in non-game scenarios, through points and rankings. It can bring people a certain sense of achievement, social influence and ownership, which is conducive to improving people's sense of self-efficacy.

5.1.4 Intrinsic motivation and users' intention to continuous usage

Among the three intrinsic motivations, self-presentation is not correlated with users' intention to continuous usage, while entertainment and self-efficacy are. The reasons are that self-presentation does not guarantee that people are more willing to use mobile e-business apps; earning points and ranking in Alipay Ant Forest game can meet people's entertainment needs thus promote continuous usage intention; earning points and ranking in Alipay Ant Forest game are the proof of self-competency, the higher self-efficacy is, the stronger the intention to continuous usage.

5.1.5 Mediation effect of intrinsic motivation

The mediation effect of the three intrinsic motivators is different. Self-presentation does not mediate between gamification and the user's intention to continuous usage, while entertainment and self-efficacy do play a partial mediation effect. The purpose of users attending the Alipay Ant Forest activities are to present their image and ability, which does not guarantee their intention to continuous usage. Gaining points and ranking, to some extent, can fulfill people's entertainment and practical needs, thus partially mediate between gamification and user's intention to continuous usage

5.2 Managerial contribution

In reality, most of the stimuli come from external stimuli such as money, which can hardly give full play to users' creative and initiative. Therefore, gamification as an intrinsic motivation can improve users' participation frequency to some extent.

5.2.1 Focus on the selection of game elements

When carrying out marketing activities, enterprises should fully consider the design of game elements, combine and match different game elements, and make users better realize self-presentation through game elements such as points and ranking, so as to satisfy users' desire for entertainment and self-strength.

5.2.2 Focus on the user's internal needs

In the process of marketing, enterprises should fully consider the internal needs of customers, such as adding entertainment elements or challengeable programs, to stimulate users' interest and to enhance usage frequency and continuity.

5.2.3 Promote the practice of gamification marketing

Gamification (e.g. game elements) should be blended into marketing promotion activities, in order to enhance user's experience of game-like scenes, and improve their stickiness and continuous intention. Gamification marketing on the one hand can satisfy consumers' needs, on the other can reduce the cost of enterprises.

5.3 Limitations and future research

This paper mainly studies the influence of gamification on users' intention to continuous usage from the perspective of users' intrinsic motivation (self-presentation, entertainment and self-efficacy). User's game experience is not considered within the research process, and can be studied in the future

Last but not the least, the research object was limited to Alipay Ant Forest case which may not be so representative, future study may add more game-like activities into the research.

REFERENCES

- [1] Altuna O ,Konuk F.Understanding consumer attitudes toward mobile advertising and its impact on consumers'behavioral intentions:a cross-market comparison of United States and Turkish consumers[J] International Journal of Mobile Marketing, 2009,4(2): 43-51
- [2] Bunchball. Gamification 101: An introduction to the use of game dynamics to influence behavior[EB/OL]. 2010.<http://jndglobal.com/wp-content/uploads/2011/05/gamification1011.pdf>.

- [3] Bittner J V, Schipper J. Motivational effects and age differences of gamification in product advertising[J]. *Journal of Consumer Marketing*, 2014, 31 (5) : 391–400.
- [4] Bhattacharjee A. Understanding information systems continuance: an expectation-Confirmation model[J]. *MIS Quarterly*, 2001, 25(3):351-370
- [5] Brown J D. *The Self*[M]. New York: Psychology Press, 2007
- [6] Boyle K, Johnson T J. Myspace is your space? Examining self-presentation of myspace users[J]. *Computers in Human Behavior*, 2010, 26(6):1392-1399
- [7] Bilgihan A, Nusair K, Okumus F, et al. Applying flow theory to booking experiences: an integrated model in an online service context[J]. *Information & Management*, 2015, 52(6):668-678
- [8] Basak E, Calisir F. An empirical study on factors affecting continuance intention of using Facebook[J]. *Computers in Behavior*, 2015, 48:181-189
- [9] Brito R D S, Pinochet L H C, Lopes E L, et al. Development of a gamification characteristics Measurement scale for mobile application users[J]. *Review of International Business*, 2018, 13(1):1-16
- [10] Chou Y. *Octalysis: complete gamification framework*-Yu-kai Zhou[M]. Fremont, CA: Octalysis, Media, 2015
- [11] Chiu C M, Wang E T C, Shih, et al. Understanding knowledge sharing in virtual communities[J]. *Journal of Management Information Systems*, 2011, 35(1):134-153
- [12] Deng X, Joshi K, Galliers R D. The duality of empowerment and marginalization in microtask crowdsourcing: giving voice to the less powerful through value sensitive design[J]. *MIS Quarterly*, 2016, 40(2):279-302
- [13] Feng Y, Ye H J, Yu Y, et al. Gamification artifacts and crowdsourcing participation: examining the mediating role of intrinsic motivations[J]. *Computers in Human Behavior*, 2018, 81:124-136
- [14] Aita R, Vitkauskaitė E, Gadeikiene A, et al. Gamification as a mean of driving online consumer behaviour: Sor model perspective[J]. *Engineering Economics*, 2016b, 27 (1) : 90–97
- [15] Gist M E. The influence of training method on self-efficacy and idea generation among managers [J]. *Personnel Psychology*, 1989, 42(4):787-805
- [16] Goh D H, Pe-Than E P P, Lee C S. Perceptions of virtual reward systems in crowdsourcing games[J]. *Computers in Human Behavior*, 2017, 70:365-374
- [17] Huotari K, Hamari J. A definition for gamification: Anchoring gamification in the service marketing literature[J]. *Electronic Markets*, 2017, 27 (1) : 21–31.
- [18] Harwood T, Garry T. An investigation into gamification as a customer engagement experience environment[J]. *Journal of Services Marketing*, 2015, 29 (6-7) : 533–546.
- [19] Huang J H, Yang T K. The effectiveness of in-game advertising: The impacts of ad type and game/ad relevance[J]. *International Journal of Electronic Business Management*, 2012, 10 (1) : 61–72.
- [20] Hassan L, Dias A, Hamari J. How motivational feedback increases user's benefits and continued use: A study on gamification, quantified-self and social networking[J]. *International Journal of Information Management*, 2019(46): 151-162.
- [21] Hang H M, Auty S. Children playing branded video games: The impact of interactivity on product placement effectiveness[J]. *Journal of Consumer Psychology*, 2011, 21 (1) : 65–72.
- [22] Hsu C L, Chen M C. How gamification marketing activities motivate desirable consumer behaviors: focusing on the role of brand love[J]. *Computers in Human Behavior*, 2018, 88:121-133
- [23] Hu M, Zhang M, Wang Y. Why do audiences choose to keep watching on live streaming platforms? An explanation of dual identification framework[J]. *Computers in Human Behavior*, 2017, 75(10):594-606
- [24] Huang C K, Chen C D, Liu Y T. To stay or not to stay? Discontinuance intention of gamification apps[J]. *Information Technology & People*, 2019. <https://doi.org/10.1108/ITP-08-2017-0271>
- [25] Hart W, Adams J, Burton K A, et al. Narcissism and self-presentation: profiling grandiose and vulnerable Narcissists' self-presentation tactic use[J]. *Personality and Individual Differences*, 2017, 104:48-57

- [26] Huang L Y,Hsieh Y J.Predicting online game loyalty based on need gratification and experiential motives[J].Internet Research,2011,21(5):581-598
- [27] Hamari J, Koivisto J, Sarsa H. Does gamification work? A literature review of empirical studies on gamification[A].Proceedings of the 47th Hawaii International Conference on System Sciences[C]. Waikoloa, HI, USA: IEEE, 2014:3025–3034
- [28] Jang S,Kitchen P H,Kim J.The effects of gamified customer benefits and characteristic on behavioral engagement and purchase:evidence from mobile exercise application uses[J].Journal of Business Research,2018,92:250-259
- [29] Jung T,Youn H, McClung S.Motivations and self-presentation strategies on Korean-bases Cywolrd weblog format personal homepages[J].CyberPsychology&Behavior,2007,10(1):24-31
- [30] Kavaliova M, Virjee F, Maehle N, et al. Crowdsourcing innovation and product development: Gamification as a motivational driver[J]. Cogent Business & Management,2016,3(1). doi: 10.1080/23311975.2015.1128132.
- [31] Kim H W,Chan H C,Kankanhalli A.What motivates people to purchase digital items on virtual community websites?the desire for online self-presentarion[J].Information Systems Research,2012 ,23(4):1232-1245
- [32] Lee E,Ahn J,Kim Y J.Personality traits and self-presentation at Facebook[J].Personality and Individual Differences,2014,69:162-167
- [33] Lee J, Lee M, Choi I H.Social network games uncovered:motivations and their attitudinal and behavioral outcomes[J].Cyber psychology,Behavior ,and Social Networking,2012,15(12):643-648
- [34] Lee T Y,Dugan C,Geyer W,et al.Experiments on motivational feedback for crowdsourced workers[C].In International Aaai Conference on Weblogs and Social Media,2013
- [35] Ma M,Agarwal R.Through a glass darkly:information technology design,identity verification,and knowledge contribution in online communities[J].Information Systems Research,2007,18(1):42-67
- [36] Michikyan M,Subrahmanyam K,Dennis J.Can you tell who I am?Neuroticism,extraversion,and online self-presentation among young adults[J].Computers in Human Behavior,2014,33:179-183
- [37] OLIVER R L .A cognitive model for the antecedents and consequences of satisfaction[J].Journal of Marketing research,1980,(17):460-469.
- [38] Penenberg A L. Play at work: How games inspire breakthrough thinking[M]. New York: Portfolio/Penguin, 2015.
- [39] Robson K, Planger K, Kietzmann J, et al. Understanding gamification of consumer experiences[J]. Advances in Consumer Research, 2014, 42 (1) : 352–356.
- [40] Sjolint M, Constantiou I, & Trier M. Numerical representations and user behaviour in social networking Sites: Towards a multi-theoretical research framework[C].In European conference of information systems, Utrecht, the Netherland,2013
- [41] Sun Y, Wang N, Yin C,et al. Understanding the relationships between motivators and effort in crowdsourcing marketplaces:a nonlinear analysis[J].International Journal of Information Management,2015,35(3):267-276
- [42] Thongmak M.Gamifying the first programming class:outcoms and antecedents of continued engagement Intention[C].Proceedings of the AIS SIGED 2017 Conference,2017.
- [43] Wu Y,Cui T,Liu N,et al.Demystifying continuous participation in game applications at social networking sites A social playfulness design perspective[J].Internet Research,2018,28(2):374-392
- [44] Wu W Y,Sukoco B M.Why should I share?Examining consumers’ motives and trust on knowledge sharing[J].Journal of Computer Information Systems,2010,50(4):11-19
- [45] Wu Minglong. Questionnaire statistical analysis practice -- SPSS operation and application [M]. Chongqing: Chongqing university press, 2009
- [46] Wu Minglong. Structural equation model: operation and application of Amos (2nd edition) [M]. Chongqing: Chongqing university press, 2017
- [47] Wise K,Bolls P D,Kim H,et al.Enjoyment of advergemes and brand attitudes:the impact of thematic

- relevance[J].*Journal of Interactive Advertising*,2008,9(1):27-36
- [48] Yang Z,Kong X,Sun J,et al.Switching to green lifestyles:behavior change of ant forest users[J].*International Journal of Environmental Research and Public Health*,2018,15(19).<https://doi.org/10.3390/ijerph15091819>
- [49] Yang C,Brown B B.Online self-presentation on Facebook and self development during the college transition[J].*Journal of Youth and Adolescence*,2016,45(2):402-416
- [50] Ye H, Kankanhalli A.Solvers' participation in crowdsourcing platforms:examining the impacts of trust,and benefit and cost factors[J].*Journal of Strategic Information Systems*, 2017,26(2):101-117
- [51] Zuckerman O, Gal-Oz A. Deconstructing gamification: Evaluating the effectiveness of continuous measurement, virtual rewards, and social comparison for promoting physical activity[J]. *Personal and Ubiquitous Computing*,2014,18(7):1705-1719.
- [52] Zichermann G, Linder J. *The gamification revolution: How leaders leverage game mechanics to crush the competition*[M].New York: McGraw-Hill Education, 2013
- [53] Zimmerling E,Höflig C E,Sandner P G,et al.Exploring the influence of common game elements on ideation output and motivation[J].*Journal of Business Research*,2018,94:302-312.
- [54] Zhao X, Lynch J G, Chen Q. Reconsidering Baron and Kenny: Myths and Truths about Mediation Analysis[J]. *Journal of Consumer Research*, 2010, 37(2):197-206