The Relationship Between Gamification, Brand Engagement and Brand Equity

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Abstract

Many companies are increasingly attempting to build and manage brand communities that increasingly resemble games and game communities and believe that this gamification can increase the engagement and loyalty of consumers to the brand. However, currently, there is a dearth of empirical evidence supporting these expectations in the realm of marketing beyond the pervasive hype around gamification. Therefore, in this study, we investigate the relationship between gamification features, brand engagement and brand equity among consumers (N=824) from both of Xiaomi and Huawei online brand communities through a psychometric survey. The results indicate that achievement and social-related features are positively associated with emotional, cognitive and social brand engagement. Immersion-related features are positively associated with social brand engagement. Furthermore, all dimensions of brand engagement are further positively associated with brand equity. The results imply that there is a positive chain relationship between gamification, brand engagement and brand equity, and that, gamification appears to be an effective tool for brand management.

1. Introduction

Gamification refers to the design that attempts to bring about similar positive experiences as games do, and consequently, affect user behaviour and cognitive processes [27]. In the marketing realm, gamification has been used by many enterprises to improve advertising performance [50, 56], engage customers [21, 45] and enhance perceived brand value [55]. Especially in brand management, many international companies adopt gamification techniques to increase consumers' brand awareness, brand attitude and brand loyalty, such as *Where's Waldo* on Google Map, *Ant forest* of Alipay and *Samsung Nation* online

community, etc. Although gamification has offered a novel way for marketers [16, 17, 23, 27, 36, 50, 55], the mechanisms of how gamification may impact brand success remains unclear due to lack of empirical evidence within this field.

Relevant research that has examined the relationship between gamification and brand equity is still at an initial stage, mainly focused on brand attitude [50, 55], brand engagement [4, 21] and brand involvement [41], lack of in-depth discussion. Brand equity, as one of the important goals of social media marketing, only received limited attention in the gamification-related literature.

Therefore, the objective of the present paper is to investigate the relationship between customers' interaction with different gamification features and emotional, cognitive and social brand engagement and further brand equity in social commerce. We employ an online survey conducted among consumers (N=824) from gamified brand communities of Xiaomi and Huawei, which are two of the successful gamified services in China.

2. Background

2.1. Gamification

2.1.1. Gamification. Gamification refers to the design that attempts to bring about similar positive experiences as games do, and consequently affect user behaviour and cognitive processes [27]. As the main inspiration of gamification is games, gamification commonly employs game mechanics. For instance, in the business context, different gamification features can be integrated into service, product, advertisement website, etc, in order to increase participation [45], engagement [21, 23, 43] and loyalty [61]. In the body of literature related to game and gamification studies, it is most established to make a distinction between three primary categories of game/gamification mechanics and game-design related gaming motivations: immersion-related, achievement-related and social-

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related dimensions [19, 36, 42, 47, 57, 58]. Immersion-related features primarily attempt to immerse the player in self-directed inquisitive activity, and include such game mechanics as avatars, storytelling, narrative structures, role-play mechanics, etc. Achievement-related features primarily attempt to increase players' sense of accomplishment and include such game mechanics as badges, challenges, missions, goals, leaderboards, progression metrics, etc. Social-related features primarily attempt to enable players social interaction, and include such game mechanics as cooperation/collaboration structures, praise, etc.

2.1.2. Gamification and brand management. Given that gamification in marketing is still a new area, only a few studies have empirically investigated the relationship between gamification and aspects of brand management. The literature has thus far focused on the relationship between gamification/game and brand attitude [50, 55], brand recall [38], brand engagement [4], brand involvement [41], brand equity [26], service use [16], continued use [18] and purchase intentions [30]. Overall, the current body of literature suggests that gamification may have a positive effect on brand equity.

However, across this body of research, the biggest glaring problem is that most studies did not measure the users' interaction with gamification but rather assume that users would have been exposed to gamification, and therefore, on a vaguer level often retort to investigating the intentions of people to e.g. continue using the gamified system. Another limitation of the current body of literature is that most studies only investigated the association between only few gamification mechanics and brand-related aspects, essentially only covering a small portion of the research question related to gamification and consumer behaviour. Moreover, the relationship between gamification and brand management is not usually clearly theoretically specified in past research [36].

2.2. Brand Engagement

Band engagement is considered to be co-creative customer experiences where consumers interact with a focal agent/object (e.g. a brand), which then further reflects the nature of consumers' particular interactive brand relationships [5, 14, 25, 49]. Generally speaking, brand engagement can be seen as a multidimensional psychological state that is a consequence of interacting with a brand. It includes aspects of emotional, cognitive and social engagement [6, 51, 52, 60]. Emotional aspect of brand engagement is related to affection refers to "a consumer's degree of positive

brand-related affect in a particular consumer/brand interaction" [25] or enthusiasm refers to "the zealous reactions and feelings of a person related to using or interacting with the focus of their engagement" [48, 52]. Unlikely, cognitive engagement, which is the extent of individuals' cognitive investment in specific brand interactions [24]. Cognitive brand engagement refers to the degree of interest the person has or wishes to have in interacting with the focus of their engagement, named conscious attention [52], the duration of focus on [48] or the brand-related thought processing and elaboration in brand interaction [25]. Social brand engagement [51, 52, 60], involves enhancement of the interaction based on the inclusion of others with the focus of engagement.

A few gamification-related studies have explored the relationship between gamification and brand engagement. However, existing evidence of their relationship is still wanting. For example, based on flow theory, Berger et al. [4] showed that gamified interactions, which are highly interactive and optimally challenging, are positively related to emotional and cognitive dimensions of brand engagement. Gatautis et al. [15] conducted the empirical study on the impact of gamification on consumer brand engagement in the Lithuanian market. Even though the relationship was not strong according to the empirical result, there are reasons to believe that gamification can positively affect brand engagement.

Regarding the relationship between gamification and brand engagement, currently, there does not exist clear empirical basis on which to sturdy base hypotheses on. However, if we draw from larger game and gamification research [19, 36, 42, 47, 57, 58] and brand engagement literature [31, 35], parallels between classes of gamification features and dimensions of brand engagement can be drawn. Immersive features are commonly connected to more emotional and affective aspects of experience and engagement: being immersed in stories, narrative, and feelings (e.g. Yee, [57]). Thus, when customers interact with immersion-related features such as storytelling, narrative structures, role-play mechanics, etc., customers can be predicted to be more likely to have positive feelings, passions and express more enthusiasm towards the specific brand. Whereas achievement-oriented features and play is commonly tied to more cognitive style, goal-driven engagement and behaviour (e.g. Yee, [57]). Achievement-related features are composed of goal-structures and optimizing one's behaviour etc. that require more cognitive processes, therefore it can be assumed that achievement-related features are more likely to be associated most strongly with cognitive brand engagement. Social related game features can be assumed to be naturally linked with social engagement.

When there are more social-oriented features in online brand-related context, customers can easily get/share information about the brand from/to others. The customer may become a brand propagandist, strengthening the connection with others based on specific brand [22]. Thus, we put forward the following hypotheses:

H1. Interaction with immersion-related gamification features is positively and more strongly associated with emotional brand engagement than with other dimensions of brand engagement.

H2. Interaction with achievement-related gamification features is positively and more strongly associated with cognitive brand engagement than with other dimensions of brand engagement.

H3. Interaction with social-related gamification features is positively and more strongly associated with social brand engagement than with other dimensions of brand engagement.

2.3 Brand equity

Brand equity can be regarded as one of the most core parts of intangible assets a company has [34, 46], and which can bring competitive advantages [37]. In this study, we focus on brand equity from the perspective of the individual consumer (customer-based brand equity), which originates from traditional cognitive psychology and information economics. Customer-based brand equity refers to the differential effect of brand knowledge on customer response to the marketing of brand [32], or the different response between a focal brand and an unbranded product [59]. Brand equity is commonly defined through the consumer awareness of brand and their loyalty to the brand [1].

Brand engagement is often considered one part of corporate societal marketing to build brand equity [22]. When customers are willing to invest more time, energy and money, they might be more loyal to a brand. Also, customers who have higher engagement with a brand can be more satisfied with the brand and higher loyalty [54]. In addition, when customers actively interact with a brand in social media-based context, not only they will review some information about the brand, but also recommend this brand to others and has higher intentions to buy [28]. We can easily expect that brand engagement is positively related to brand equity.

Consistent with the brand-related literature, in this study, we expect that the three different dimensions of brand engagement will facilitate brand equity. When customers have a positive emotion with the brand, the strong feelings can drive consumers' strong desire to keep a positive relationship with brand, which can lead

to repeat purchasing behaviour or the willingness of continue to use, which further increase the brand loyalty. Moreover, when customers positively engage with the brand, they will often pay more attentions to the relevant information of the enterprise or brand per se, discuss and share the brand with other customers, which bring higher brand awareness. Therefore, the following hypothesis can be proposed:

H4. Brand engagement (emotional, cognitive and social) is positively associated with brand equity.

3. Empirical study

3.1. Measurement

We conducted an online survey lasting almost three months in Xiaomi and Huawei gamified online brand communities, which represents two large technology product-related online brand communities in China. Based on the T-test results of the samples from the first month and the last month respectively, there is no significant difference between different samples. Three master students extracted the gamification features in both of the two online brand communities separately, and two PhD candidates integrated those similar elements. A total of thirteen gamification features were identified. Surprisingly, both communities employed the same set of gamification features even though their implementation varied between the communities. Based on the research from Yee [57] and Koivisto & Hamari [36], in this study, avatars/virtual identity/profile, customization/personalization features and narrative/story are categorized as immersion-related features; badges/medals/trophies, virtual currency/coins, points/score/experience points, status bar/progress, level, leaderboards/rankings/highscore lists and increasingly difficult tasks are achievement-related features; competition, cooperation and social network features are social-related features. The participants were asked to estimate the frequency at which they interact with each feature and the importance of that interaction. We measured all of the items using then 7-point scale, ranging from 1 (no at all important) to 7 (extremely important) and from 1 (never) to 7 (every time). In accordance with prior research on games and gamification, the mechanics were divided into three latent constructs: interaction with immersion-related gamification features (3), achievement-related gamification features (7) and social-related gamification features (3).

Further, we assessed emotional brand engagement with five items, cognitive brand engagement with four items and social brand engagement with six items based on So et al. [48], Vivek [51] and Vivek et al.

[52]. A 7-point scale was provided, ranging from 1 (strongly disagree) to 7 (strongly agree). Higher scores indicated higher consumer brand engagement in the emotional, cognitive and social dimension.

Measurement of brand equity included brand awareness and brand loyalty. Four items to measure brand loyalty were adapted from Chaudhuri & Holbrook [8], Washburn & Plank [53] and Yoo & Donthu [59]; five items to measure brand awareness were adopted from Washburn & Plank [53] and Yoo & Donthu [59]. All of those items were slightly modified to fit the context of the study.

3.2. Participants

A sample of 824 respondents (464 from the Xiaomi community and 360 from Huawei community, respectively) participated in the study over a three-month period.

Table 1. Demographic information

	N	%
Gender		
Male	427	51.8%
Female	397	48.2%
Age		
-19	16	1.9%
20-29	338	41.0%
30-39	321	39.0%
40-	149	18.1%
Occupation		
A student	166	20.1%
Self-employed	45	5.5%
Employed for wages	410	49.8%
Military/Government	77	9.3%
professional/technical	94	11.4%
Unemployed	18	2.2%
Others	14	1.70%
Education		
Middle school	8	1.0%
High school/ Vocational education/technical school	41	5.0%
Associate's degree	66	8.0%
Bachelor's degree	539	65.4%
Master's degree and above	170	20.6%
Income per month (rmb)		
-2499	25	3.0%
2500-4999	200	24.3%
5000-7499	167	20.3%
7500-9999	223	27.1%
10000-12499	116	14.1%
12500-14999	53	6.4%
15000-17499	27	3.3%
17500-19999	6	0.7%
20000-	7	0.8%

Table 1 presents the demographic characteristics of the respondents. The gender distribution of the sample is equal with male respondents representing 51.8% and female respondents representing 48.2%. Regarding age, most of the respondents were between the ages of 20 and 39, taking up 80%. Most respondents completed a bachelor's degree (86%); 49.8% are employed for wages and 20.15% are students. 97% respondents' monthly income is higher than 2499 RMB and 0.8% is over 19999 RMB.

3.3. Measure model

The analysis of validity and reliability of the measurement model as well as the analysis of the path model was undertaken using the component-based PLS-SEM (Smart-PLS 3.0). When the measurement model includes formative constructs, PLS-SEM is considered more appropriate structural equation modelling technique when compared to CB-SEM [2, 9, 10, 20, 39]. According to the understanding of formative construct from Jarvis et al. [29] and Rossiter [44], in this study, three different gamified interactions are formative constructs, since frequency and importance of each gamification feature is posited as the common cause of construct and variation in item measures causes variation in the construct. Contrariwise, three dimensions of brand engagement and brand equity are reflective models given that indicators are assumed to be caused by the latent variable. The model includes both formative constructs (interactions with gamification features) and reflective constructs (brand engagement and brand equity).

3.3.1. Formative measurement model. The validity of formative constructs is assessed differently from reflective measurement. With formative constructs, the assumption is not that items would correlate but rather the construct is "formed" from the indicators. We assessed collinearity and external validity of formative measurement model. The variance inflation factors (VIF) for each indicator indicate the possible presence of collinearity. For formative measures, VIF values greater than 3.3 indicate high multicollinearity [12]. After running the PLS algorithm, all VIFs range from 2.457 to 1.539 (lower than 3), which suggest that multicollinearity is not a threat. Some authors suggest testing the external validity of a formatively measured construct instead of internal consistency examinations (e.g., Cronbach's alpha, [3, 11]), thus this study assessed the validity of formative constructs by evaluating indicator weights and loadings. Indicators of well-specified formative constructs should have statistically significant weights [7], but indicators with

statistically non-significant weights but high loadings have high absolute (though low relative) influence on the construct and should be retained in the model [40]. Even though some indicators do have low weights and non-significant, all indicators have high loadings (above 0.565), which indicates acceptable external validity. Table 2 presents the loading, weight and VIF of formative measurement.

Table 2. Formative measurement

Construct		Loading	Weight	VIF
Interaction with immersion-related features				
-The importance of interacting with _____				
IIF1	avatars/virtual identity/profile	0.691	0.003	2.068
IIF2	customization/ personalization	0.729	0.283	1.539
IIF3	narrative/story	0.771	0.264	1.847
-The frequency of interacting with_____				
FIF1	avatars/virtual identity/profile	0.889	0.508	1.936
FIF2	customization/ personalization	0.699	0.149	1.667
FIF3	narrative/story	0.703	0.047	2.031
Interaction with achievement-related features				
-The importance of interacting with _____				
IAF1	badges/medals/ trophies	0.739	0.124	2.085
IAF2	virtual currency/coins	0.682	0.047	2.046
IAF3	points/scores/ experience points	0.674	0.077	1.994
IAF4	status bars/ progress bars	0.614	-0.032	1.857
IAF5	avatars/ virtual identity/ profile levels	0.810	0.271	2.205
IAF6	leaderboards/ rankings/ highscore lists	0.602	-0.064	1.870
IAF7	increasingly difficult tasks	0.685	0.027	2.033
-The frequency of interacting with_____				
FAF1	badges/medals/ trophies	0.791	0.229	2.290
FAF2	virtual currency/coins	0.615	0.108	1.582
FAF3	points/scores/ experience points	0.730	0.063	2.322
FAF4	status bars/ progress bars	0.574	-0.114	1.908
FAF5	avatars/ virtual identity/ profile levels	0.879	0.443	2.133
FAF6	leaderboards	0.565	-0.028	1.665
FAF7	/rankings/ highscore lists increasingly difficult tasks	0.725	0.059	2.151
Interaction with social-related features				
-The importance of interacting with _____				
ISF1	competition	0.835	0.369	1.963
ISF2	team/ cooperation	0.810	0.130	2.457
ISF3	social networking features	0.754	0.273	1.584
-The frequency of interacting with_____				
FSF1	competition	0.655	0.034	1.739
FSF2	team/ cooperation	0.782	0.249	1.878
FSF3	social networking features	0.750	0.218	1.708

3.3.2. Reflective measurement model. We assessed the validity and reliability of reflective measurement model. To check the properties of the measurement scales, we conducted confirmatory factor analysis (CFA) to assess reliability, convergent validity, and discriminant validity of the reflective constructs. We assessed convergent validity with three metrics: average variance extracted (AVE) and composite reliability (CR) and Cronbach's Alpha. Firstly, we investigated the loadings of the items and found the loading of item SBE 4 (I feel good about sharing my experiences with the products of the brand with others) was 0.319, which is lower than 0.6. By removing item SBE4, all Cronbach's α of variables are higher than recommended value 0.7 [33] and the AVE of emotional aspect of brand engagement (0.678), cognitive aspect (0.639) and social aspect (0.630) and brand equity (0.543) were higher than 0.5 [13]. As for the construct reliability (CR), all values were between 0.876 and 0.913, higher than 0.7 [13]. See Table 3 for more details.

As per discriminant validity, no inter-correlation of constructs exceeds the square root of the AVE of either of those compared constructs (see Table 4). The square root of the AVE of the three dimensions of brand engagement and brand equity is 0.824, 0.799, 0.794 and 0.737. We can conclude that the discriminant validity is met.

Table 3. Reflective measurement

Construct		Loading
Brand engagement		
Emotional dimension α= 0.881 CR= 0.913 AVE=0.678		
EBE1	I feel excited about this brand	0.817
EBE2	I am heavily into this brand	0.874
EBE3	I am passionate about this brand	0.741
EBE4	I am enthusiastic about this brand	0.797
EBE5	I love this brand	0.881
Cognitive dimension α= 0.812 CR= 0.876 AVE=0.639		
CBE1	I like to learn more about this brand	0.763
CBE2	I pay a lot of attention to anything about this brand	0.812
CBE3	Anything related to this band grabs my attention	0.825
CBE4	I think about the brand a lot	0.796
Social dimension α= 0.853 CR= 0.895 AVE=0.630		
SBE1	I love talking and using products of the brand with my friends	0.812
SBE2	I enjoy talking and using products of the brand more when I am with others	0.758
SBE3	Talking and using products of the brand are more fun when other people around me do it too	0.838
SBE4	*I feel good about sharing my experiences with the products of the brand with others*	omitted
SBE5	I feel fellowship with other people who use the products of the brand	0.786
SBE6	I like recommending the products of the brand to others	0.773
Brand equity α= 0.895 CR= 0.914 AVE=0.543		
Brand loyalty		
BL1	I will not buy other brands if X is available at the store.	0.700
BL2	I am committed to this brand	0.743
BL3	I will likely buy this brand the next time I buy [product name, Huawei or Xiaomi]	0.747
BL4	1 would be willing to pay a higher price for this brand over other brands (assuming the products were otherwise similar in features).	0.719
Brand awareness		
BA1	I am very familiar with this brand	0.738
BA2	I can recognize the brand among other competing brands	0.748
BA3	Some characteristics of the brand come to my mind quickly if I think about the brand.	0.743
BA4	I can quickly recall the symbol or logo of this brand	0.738
BA5	It is not very difficult for me to imagine this brand	0.751

Note: SEB4 is omitted due to poor loading.

Table 4. Discriminant Validity

	IGF	AGF	SGF	EBE	CBE	SBE	BE
IGF	**N/A**						
AGF	0.282	**N/A**					
SGF	0.258	0.248	**N/A**				
EBE	0.150	0.238	0.239	**0.824**			
CBE	0.171	0.270	0.261	0.498	**0.799**		
SBE	0.193	0.275	0.287	0.511	0.572	**0.794**	
BE	0.149	0.144	0.165	0.380	0.355	0.337	**0.737**

Note: IGF=immersion-related gamification features; AGF=achievement-related gamification features; SGF=social-related gamification features; EBE=emotional brand engagement; CBE=cognitive brand engagement; SBE=social brand engagement; BE = brand equity. Naturally, for formative construct (IGF, AGF, SGF) AVE is not calculated.

3.4. Results (structural model)

The model explained 9.4% ($R^2 = 0.094$) of the variance of emotional brand engagement, 11.7% ($R^2 = 0.117$) of the variance of cognitive brand engagement, 13.2% ($R^2 = 0.132$) of the variance of social brand engagement and 19% ($R^2 = 0.190$) of the variance of the brand equity (Figure 1). The variance explained of the dependent variables is relatively low, indicating gamification features only can explain a small portion of brand engagement in brand communities. Surprisingly, brand engagement also explained a small part of the variability of brand equity.

Table 5. Structural equation model results

Path Coefficients	B	T	P
IGF → EBE	0.053	1.561	0.119
IGF → CBE	0.063	1.826	0.068
IGF → SBE	0.082*	2.371	0.018
AGF → EBE	0.178***	4.74	0.000
AGF → CBE	0.204***	5.789	0.000
AGF → SBE	0.198***	5.814	0.000
SGF → EBE	0.181***	5.208	0.000
SGF → CBE	0.194***	5.727	0.000
SGF → SBE	0.217***	6.265	0.000
EBE → BE	0.234***	6.547	0.000
CBE → BE	0.169***	4.319	0.000
SBE → BE	0.121**	2.976	0.003
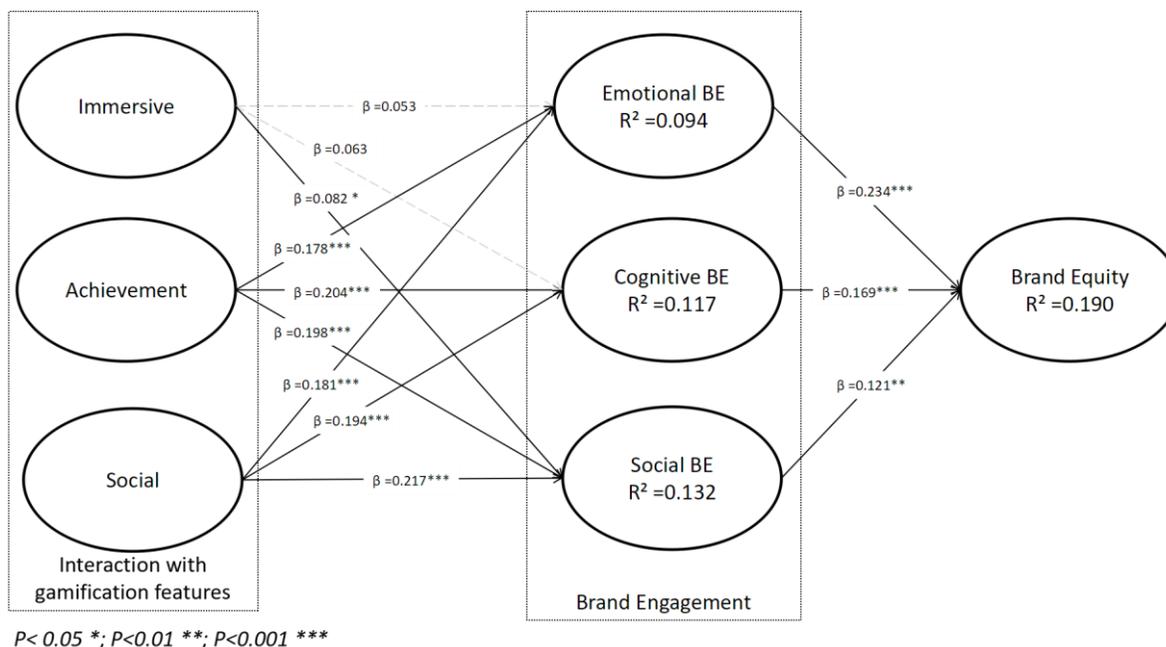
Figure 1. Results of structural equation model

As per the relationship between interaction with immersive-related features and emotional dimension of brand engagement, the results show that interaction with immersive-related features was not significantly associated with neither with emotional (β=0.053, p=0.119) or cognitive brand engagement (β=0.063, p=0.068), but was positively associated with social brand engagement (β=0.082, p=0.018). Thus, H1 cannot be supported according to the result. As per the relationship between interaction with achievement-related features and brand engagement, interaction with achievement-related features was positively associated with cognitive brand engagement (β=0.204, p<0.001). Moreover, interaction with achievement-related features was positively associated with the emotional brand engagement (β=0.178, p<0.001) and social brand engagement (β=0.198, p<0.001). Obviously, the interaction with achievement-related gamification features was more strongly associated with cognitive brand engagement than with other dimensions of brand engagement. Therefore, the above results support H2. Similarly, interaction with social-related features was positively associated with all dimensions of brand engagement: emotional (β=0.181, p<0.001), cognitive (β=0.194, p<0.001) and social brand engagement (β=0.217, p<0.001). H3 was also supported. What's more, the three dimensions of brand engagement were significant positive associated to brand equity (for emotional brand engagement, β=0.234, p<0.001; cognitive brand engagement, β=0.169, p<0.001; social

brand engagement, β=0.121, p<0.001). Therefore, the results support H4. For the full result, please refer to Table 5.

4. Discussion

Gamification has been increasingly used as an essential part of today's services, software and systems to engage and motivate users as well as to spark further behaviour. So too has marketing domain adopted gamification as a way to increase the engagement with brand and further strengthen brand equity. However, beyond optimistic expectations, currently there has been a dearth of empirical evidence on whether gamification will be able to engage consumers. Therefore, in this study we investigated the relationship between the consumers' (N=824) interactions with gamification features (thirteen features divided across immersion, achievement and social-related feature constructs) and brand engagement (emotional, cognitive and social engagement) as well as further brand equity in Xiaomi and Huawei online gamified communities that represents two large technology product-related online brand communities in China through a survey-based study.

The results showed that achievement and social-related features were positively associated with emotional, cognitive and social brand engagement (H2

and H3 not rejected). Immersive-related features were only positively related to social brand engagement (H1 predicting that interaction with immersive features would be associated with emotional and cognitive brand engagement was rejected). Furthermore, all dimensions of brand engagement were further positively associated with brand equity (H4 not rejected). Overall, the results imply that there is positive chain of associations between gamification, brand engagement and brand equity. Gamification appears to be an effective tool for brand management.

The results that were contrary to the hypotheses afford further discussion points. The main deviation from the set hypotheses was that immersive features were not positively associated with emotional brand engagement. We can speculate that this may be because some of the immersion-related features such as avatars/virtual identity/profile and personalization features have a more of a social function as they afford displaying information about oneself to other and which can facilitate consumers to exchange information about the brand rather than so spur them to explore and immerse themselves into the brand by themselves. Moreover, interacting with immersive features was also more weakly associated with cognitive and social engagement compared to interacting with achievement and social features.

Another interesting aspect of the results was that interaction with both the achievement and social features were positively associated with all of the dimensions of brand engagement. It appears that they are able to afford a wide spectrum of (brand) engagement, and therefore, the results would imply that employing them on community websites seems like a fruitful approach. For example, pertaining to the achievement features, being high on the highscore list can at the same time afford a multifaceted experience of cognitive processes of figuring out how to win, emotional experience from the result as well as a social experience stemming from the resulting social prestige.

One of the strengths of the current study was that it measured the interaction of customers with thirteen gamification features but at the same time managed to group them into more generalizable larger entities. While such modelling strategy is able to investigate the phenomenon on a more latent and broader manner, a future research avenue would be to investigate the effects of every single gamification element individually. This may help bring more granularity to similar studies, however, at the same time a larger theoretical picture might start to fade. Moreover, the gamification features might be differently implemented across different services, and therefore, a research strategy focusing on testing each mechanic individually may end up losing external validity.

As is commonplace with survey-based studies, the data consists of self-reported measures. The data was collected in Chinese technology brand communities, and therefore, it is possible that results may differ between cultures and types of brands. To increase the generalizability of the findings, future researches can select different gamified services as the research contexts or conduct intercultural studies by examining the cross-cultural difference in consumer psychology and behaviour. Also, the longitudinal study can be considered to examine the long-term effect of gamification on brand management. Moreover, future studies could investigate possible moderating effects between gamification and brand engagement. For example, the interaction with gamification may translate differently to brand engagement depending on what kind of gaming history the consumers have, what kinds of players they are or depending on their demographic factors.

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