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Xiaobei Liang

*School of Economics and Management, Tongji University, China, liangxiaobei@tongji.edu.cn*

Ruohong Hao

*School of Economics and Management, Tongji University, China, 1930424@tongji.edu.cn*

Hu Meng

*School of Economics and Management, Tongji University, China, menghu@tongji.edu.cn*

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#### Recommended Citation

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## Do Users Mind the Brand Engagement? The Effect of Brand Engagement in Knowledge Sharing Virtual Community

(Full Paper)

Xiaobei Liang, liangxiaobei@tongji.edu.cn

Ruohong Hao, 1930424@tongji.edu.cn

Hu Meng\*, menghu@tongji.edu.cn

School of Economics and Management, Tongji University, China

### ABSTRACT

Although previous studies have discussed antecedent mechanisms for user participation and the value it creates in the brand community. Few studies discuss the role of brands, communities, and users in the co-creation of value when virtual communities are established based on users' interests or needs. This paper explored the effect of brand participation on user community engagement intentions/behaviors in virtual communities. Data was collected from China by online survey and empirical analysis was used for hypotheses testing. The result shows that when brands participate in virtual communities, the higher the user's engagement intention, the easier it is for them to make knowledge contribution, which will promote the development and operation of virtual communities. What's more, in the context of brand participation, brand interactivity will affect the user's community engagement intention and thus the user's knowledge contribution, which will prompt the development of a virtual community. These findings confirmed that virtual community can help to implement circle marketing, interact with consumers, improve consumers' willingness to participate actively, and have positive practical significance for the government and firms.

*Keywords:* Virtual community, brand engagement, value co-creation, knowledge sharing.

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\*Corresponding author

### INTRODUCTION

Virtual community is not the place only for consumers to share their thoughts and questions about brands (Muniz & O'Guinn, 2001), but a place for people to share knowledge or gather information (Chiu *et al.*, 2011). Users invest in focal resources in specific interactions, such as knowledge sharing, to realize their co-creation and interactive experience in the virtual community (Hollebeek, Juric, & Tang, 2017; Hollebeek, Srivastava, & Chen, 2019; Vargo & Lusch, 2016). According to past research, people are more concerned about the interaction between consumers and brands in the context of brand community and discussed what factors influenced user behavior in this type of virtual community. They believed that, compared with the unilateral communication of traditional media, brand communities can achieve consumer-brand interaction (Brodie, Ilic, Juric, & Hollebeek, 2013). In this interactive situation, consumers can not only spread brand-related information, such as Word-of-Mouth (Hollebeek & Chen, 2014), but also can generate their content (Hollebeek & Macky, 2019). In the process of brand interaction, users have invested a lot of resources and energy, and are willing to participate in the branding co-creation (Islam, Rahman, & Hollebeek Linda, 2017; Kaur, Paruthi, Islam, & Hollebeek, 2020). Prior researches more focused on the brand participation behavior of consumers in virtual community (Brodie, Hollebeek, Juric, & Ilic, 2011; Hollebeek *et al.*, 2017; Kaur *et al.*, 2020) while a few studies have focused on the influence of brand participation behavior itself. They discussed more on users' engagement in the context of the professional community (Chen, 2007; Chiu *et al.*, 2011; Hsu, Ju, Yen, & Chang, 2007), and focused more on the user's own behavior or intentions. That is to say that prior research paid less attention to the effect of brand engagement. What's more, the previous studies explored the relationship between consumers and brands, products, and other consumers in the online brand community (McAlexander, Schouten, & Koenig, 2002), or some antecedent mechanisms that influence user's participation (Tsai & Bagozzi, 2014; Wirtz *et al.*, 2013). However, the past researches have not taken the role of virtual community into consideration. Although the brand engages in the community is regarded as the guidance of consumer behavior, and discussed its influence on consumer participation behavior in the virtual community. However, in the knowledge-sharing community, the brand usually acts as a user to share their knowledge and put forward their questions. When brands act like community users, will consumers' community participation behavior be affected? Therefore, we believed that it is necessary and valuable to explore the effect of brand engagement on user behavior in the virtual community. The attempt of this study can not only expand the theoretical construction of how brand engagement affects user community engagement in the virtual community. From a practical perspective, it can also inspire brands which that want to obtain more user traffic from the virtual community and expand their customer base.

In addition, we also found that the interaction effect among user, brand and community when brand engages in the virtual community. The past researches stated that in the virtual community, the active participation of users can emerge benefits, such as

the realization of value co-creation between users and the community (Yen, Hsu, & Huang, 2011). Therefore, we would like to distinct that if brand, user and community can achieve value co-creation when brand involving the relationship between the virtual community and the user.

The possible contributions of this study are as follows: firstly, this study will explore the participation behavior of different types of users within the virtual community. Although scholars have a consensus on user types in the virtual community, there is still controversy over the contribution of different types of users to the virtual community. For example, some studies have found that lurkers do not generate content in the community, their presence is not conducive to the development of the virtual community as a result (Badreddine & Blount, 2019). However, it has been argued that although lurkers do not generate content, their reading behavior can facilitate the diffusion of knowledge and information (Antin, Cheshire, & Acm, 2010). Based on this, this study will further discuss whether different types of users can create value in their engagement from the perspective of value co-creation. Secondly, we will also analyze it from another view. That is, the effect of brand engagement on the value co-creation between community, brand and users in the virtual community which is formed by user interests or needs. While past researches on the virtual community have been discussed in terms of users, with little research revealing the role of community and brand mostly. Thirdly, most of the studies on user participation in the virtual community focused on the antecedents of user participation or the consequences of community engagement respectively. That is, users' virtual community engagement intentions or behaviors are treated as either independent or dependent variables. Few papers have discussed how the antecedents of user community engagement affect the outcomes. This study will try to dissect both the antecedents (user type) and the outcomes (value co-creation) of user engagement in the virtual community, enriching the theoretical extension.

Combined with the above considerations, this study will develop the hypotheses and theoretical model on the basis of the literature review of knowledge sharing in the context of the virtual community. Furthermore, the consumer data obtained from the experiment will be used for analysis and discussion later. Moreover, the theoretical and managerial implications will also be proposed to provide some references for other scholars or managers.

### LITERATURE AND HYPOTHESES

Knowledge sharing plays a vital role in the development of the virtual community (Chiu, Hsu, & Wang, 2006; Zhang *et al.*, 2010). It is a critical factor to keeps the virtual community operate normally (Dholakia, Bagozzi, & Pearo, 2004). For example, Caterpillar has invested in building firm knowledge networks to facilitate knowledge sharing among employees, which ultimately achieving about 200% return on investment (Chiu *et al.*, 2011; Zhang *et al.*, 2010). In the past, the knowledge sharing behavior in the virtual community was mostly considered from the user's intrinsic motivation or social factors. Considering the internal motivation of user participation, self-expression and self-actualization affect the knowledge sharing behavior of users in the virtual community (Shao, 2009). In order to shape an individual's image, knowledge or experience is usually expressed to others through knowledge sharing in virtual communities. Studies have also shown that users are more willing to share knowledge, if they are confident that they can perform better and obtain a higher sense of self-efficacy from knowledge sharing (Hsu *et al.*, 2007). In addition, psychological safety is another vital factor that will influence users' knowledge sharing in the virtual community. When users perceived that it is safe to participate in a virtual community, they are more likely to express themselves, present themselves, and share their knowledge in a virtual community (Zhang *et al.*, 2010). From the perspective of social factors, social capital (Chang & Chuang, 2011; Wasko & Faraj, 2005), social interaction (Chen, 2007), social identity (Ma & Agarwal, 2007), user satisfaction with the community (Zhang *et al.*, 2010), and trust (Zhao, Wang, & Fan, 2015) will all have a significant effect on users' participation and knowledge sharing in the virtual community. While these studies illustrated which motivations for participation within virtual community's influence users' knowledge-sharing behaviors, it is limited to the participants themselves and does not consider the role of community or brand in these knowledge-sharing processes.

Knowledge sharing within the virtual community yields many outcomes. Past studies have suggested that brands can integrate knowledge within virtual communities to innovate new products (Tsai, Liao, & Hsu, 2015), improve operational efficiency (Revilla & Knoppen, 2015), enhance consumer contributions to collaborative product (Hollebeek & Chen, 2014). Also, for the community, users' participation in the community brings knowledge contributions (Chen, Yang, & Tang, 2013; Chou, Lin, & Huang, 2016) or spreads positive word of mouth (Mathwick, Wiertz, & De Ruyter, 2008). These studies suggested that it is necessary to promote the knowledge sharing behavior of users within the community, both for the community itself and for the brand. However, these studies only consider the contribution that user engagement behavior makes to community or brand development respectively. They do not consider the role of all three roles in value creation simultaneously. Therefore, we try to explore the role of the user, the brand, and the community simultaneously. What's more, we will also explore how the brand's intervention affects the user's intention to participate in the virtual community, and what value they create when all three work together.

Hence, we will next explore how brand engagement influences the knowledge-sharing behavior of different types of users, to achieve value co-creation between brands, users and the virtual community. It should be pointed out that the context of these discussions is a virtual community based on users' interests or needs.

### User type

It plays an important role that the willingness of community members to participate, the information obtained and the content generated by others on the sustainable development of online communities (Fuller *et al.*, 2014). But different types of individuals have different willingness to participate in the virtual community (Akar & Mardikyan, 2018; Garnefeld, Iseke, & Krebs, 2012). According to user content generation behavior in knowledge sharing virtual community, users can be divided into two types: poster and lurker. The poster refers to the user who regularly logs into an online community and generates content for it, and has significant value to the ecosystem of the virtual community (Chen *et al.*, 2019). Most of the knowledge sharing content in the community is contributed by posters (van Mierlo, 2014). While lurkers always log in to the online community without any contribution of new content. Scholars take a different view of the contribution of lurkers to the virtual community. Some argued that lurkers do not generate content and that their actions undermine organizational civilization behavior in the community (Badreddine & Blount, 2019). However, some believed that although lurkers seem to be free-riders, their reading behavior has a positive effect on community development (Antin *et al.*, 2010). However, we believed that both posters and lurkers have different intention of community engagement. Compared to lurkers, posters share their knowledge to achieve a sense of self-worth (Bock, Zmud, Kim, & Lee, 2005), which could motivate them to engage in the virtual community. Thus, the following hypothesis is posited:

*H1: Compared to lurkers, the poster has a positive intention of community engagement.*

### Value co-creation in virtual community

From a traditional product perspective, producers and consumers are separated. As the economy develops, people increasingly find that people are a critical factor in the consumption market. From a service-centric market perspective, consumers can always participate in value creation (Vargo & Lusch, 2004). In the process of interaction with consumers, the value co-creation of products or service are realized (Prahalad, 2004). The value co-creation is not limited to the interaction between the brand and the consumer, but different participants-suppliers, business partners, and allies- co-create value (Zhang *et al.*, 2020). Hence, we considered that when a brand engages in a virtual community, the co-creation of value will be generated between the user, the community and the brand.

User and Community. In a virtual community, value co-creation activities will bring the community economic or hedonic value. Members of the online healthy community can reduce the health care cost by various activities, which will generate economic value (Liu *et al.*, 2020). Users in the virtual community co-create the value with the community or other users by various activities. While the knowledge contribution and organizational citizenship behavior (Chen & Hung, 2010; Chiu *et al.*, 2011; Chou *et al.*, 2016; Dholakia *et al.*, 2004) were regarded as two typical and popular value co-creation behavior of users in the context of virtual community in the prior researches. Knowledge contribution was considered as an important user behavior, which can ensure the operation of the virtual community normal and organizational citizenship behaviors such as help and tolerance can maintain the order of the virtual community (Dholakia *et al.*, 2004).

Therefore, we believe that when brands engage in the virtual community through various activities, users' willingness to participate in the community is stronger. They are more inclined to share knowledge in virtual communities in order to maintain the community and ensure its normal operation, which will realize the value co-creation between users and the community.

User and Brand. Customer brand co-creation behavior is a customer-led interaction between customers and brands that assumes that customers are not passive purchasers of the brand, but that they actively participate in the creation of the brand experience (Prahalad & Ramaswamy, 2000; Vargo & Lusch, 2004). This brand co-creation behavior is mainly divided into direct creation and indirect creation, where direct value creation occurs directly between the customer and the brand and may include participation in an online competition for product improvement, and indirect value co-creation occurs indirectly between the customer and the brand and is a customer-led interaction that may include interaction with other customers, friends and family, and other networks (France, Merrilees, & Miller, 2015). By interacting with consumers in the virtual community, it helps brands to establish consumer loyalty for branding co-creation (Wang & Hajli, 2014). Thus, we suppose that:

*H2: The intention of community engagement from different types of user, will influence (a) knowledge contribution, and (b) branding co-creation in the context of brand engagement in the virtual community.*

### Brand Engagement

Brand engagement refers to "A cognitive and affective commitment to an active relationship with the brand as personified by the website or other computer-mediated entities designed to communicate brand value" (Mollen & Wilson, 2010). Among them, brand interactivity is at the core of brand engagement, enhancing the effectiveness of brand engagement (Mangold & Faulds, 2009; Wirtz *et al.*, 2013). In the field of social media, brands engage in social media through different KOLs, thereby influencing consumer attitudes towards the brand (Hughes, Swaminathan, & Brooks, 2019). In the knowledge sharing virtual community, we regard

“brand engagement” as acting like a user. Thus, we believed that on the one hand, brand engagement enhances the interaction between the brand and users, which provides users with the power to share knowledge and promotes them to make knowledge contributions. On the other hand, brand interactivity can affect users' attitudes towards the brand, thereby encouraging them to spread the brand's positive word of mouth. That is:

*H3: The brand interactivity will influence (a) knowledge contribution, and (b) branding co-creation by the users' community engagement, in the context of brand engagement in the virtual community.*

Based on the above hypotheses, our research model is shown as Figure 1.

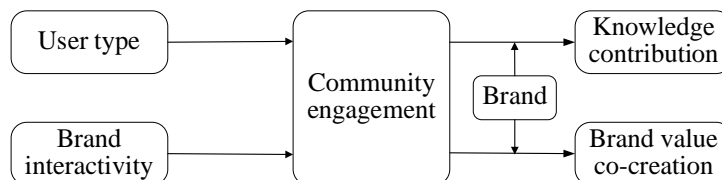


Figure 1: Theoretical model.

## MEASUREMENT

### Data collection

**Participants.** Data were collected from 73 participants from China through an online survey. There are 63 participants who provided usable information, representing a response rate of 86.3%. Among these remaining 63 participants, 10 are males and 53 are females. 49.2% are undergraduates and 49.2% are postgraduate. The degree of the remaining people is lower than the bachelor's degree. When asked whether to join into a virtual community ever before, 43 participants said yes and 31.7% of participants never participated in a virtual community.

**Procedure and materials.** We set two experimental scenarios with brand engagement (brand engagement: with brand vs. without brand), so as to explore whether and how brand engagement affects the intention of virtual community participation for different users and the value co-creation among users, communities and brands in the community ecology. Which that controlled other information was the same and asked participants to browse the virtual community set in the experiment and finish the questionnaires. In addition, to collect data better, we had conducted an online survey. On the one hand to provide a real experiment environment for the respondents- virtual communities are generally placing where users can perform activities online. On the other hand, more samples that meet the characteristics of netizens can be selected online, without being affected by the geographic location of the offline experiment which leads to large deviations in the experiment.

A knowledge-sharing virtual community is used for our experimental material. It is because that the content of knowledge sharing virtual community is mainly generated by users, and the knowledge sharing behavior of users will not be controlled by the brand. In a knowledge-sharing virtual community, brand participation can be regarded as an exogenous variable.

Each subject was randomly divided into two groups of experimental scenarios. Before the experiment, we will ask the subjects to imagine that they are browsing a knowledge sharing virtual community. Each subject was told as follows:

*Imagine that you are browsing your favorite online virtual community and reading the following page (experiment scenarios). Then, please answer the following questions according to your real feelings.*

### Measures

All experimental questionnaire items were rated on a five-point Likert scale (1: strongly disagree, 5: strongly agree). All the details of the scale can be checked in Table 1.

**User type.** We believed that users in the virtual community can be divided into two types: Lurker and Posters. So that we included user type as a dummy variable: the type=1 if the respondent is a poster in the community and 0 if he/she is a lurker.

**Community Engagement.** We used the community engagement to measure the user's engagement intention in the virtual community. The four-item scale was developed by Algesheimer, Dholakia, and Herrmann (2005). A sample item from Community Engagement was “I benefit from following the virtual community's rules”. The Cronbach's alpha was 0.766.

**Brand Interactivity.** We used the Brand Interactivity to measure the users' perception of brand engagement in the virtual community. The three-item scale was developed by Cheung, Pires, Rosenberger, and De Oliverira (2020). A sample item from

Brand Interactivity was “The content about the brand X found in the virtual community seems interesting”. Cronbach’s alpha was 0.859 for brand interactivity.

**Value Co-creation.** We considered the value co-creation between users, brand and virtual community these three roles from both user-brand and user-community perspectives. Among these, user-community value co-creation is measured in terms of knowledge contribution. The three-item scale of Knowledge Contribution was developed by Hsu *et al.* (2007), Yi and Gong (2013), and Chou *et al.* (2016). A sample item from knowledge contribution was “I spend more time than I expected navigating the virtual community”. The Cronbach’s alpha was 0.7383. From the perspective of user and brand value co-creation, we used Branding Co-Creation to measure the value co-creation of customer and brand. A sample of branding co-creation was “I am willing to provide my experiences and suggestions when my friends want my advice on buying something from a brand I learned in the virtual community.”, which was decided by Wang and Hajli (2014). The Cronbach’s alpha was 0.915.

Table 1. Variables and their measures.

Variables	Measures
<b>Community Engagement</b>	I benefit from following the virtual community’s rules. I am motivated to participate in the virtual community’s activities because I feel better afterward. I am motivated to participate in the virtual community’s activities because I am able to support other members. I am motivated to participate in the virtual community’s activities because I am able to reach personal goals.
<b>Brand Interactivity</b>	The content about the brand X found in the virtual community seems interesting It is exciting to interact with brand X in the virtual community. It is fun to collect information on brand X in the virtual community.
<b>Knowledge Contribution</b>	I usually involve myself in discussions of various topics rather than specific topics. When discussing a complicated issue, I am usually involved in subsequent interactions. I said positive things about the virtual community to others.
<b>Branding Co-Creation</b>	I am willing to provide my experiences and suggestions when my friends want my advice on buying something from a brand I learned in the virtual community. I am willing to buy the products of a brand recommended by my friends in my favorite virtual community. I will consider the buying experiences of my friends in my favorite virtual community when I want to go for a brand I learned from the community.

## RESULTS

### Descriptive statistic

We concluded a confirmatory analysis (CFA) of a four-factor baseline model composed of community engagement, brand interactivity, knowledge sharing, and branding co-creation. The CFA results were shown in Table 2. We also performed rotational factor analysis and common method deviation analysis. The analysis results showed that the rotation factor load of each item of each factor is greater than 0.68. And Harman’s single factor test method tests the common variance, and the common method deviation of the questionnaire data is not serious.

Table 2. Model fitting results.

$\chi^2$	df	p	$\chi^2/df$	GFI	RMSEA	CFI	IFI
93.103	59	0.003	1.578	0.825	0.096	0.918	0.921

Table 3 listed the means, standard deviations and intercorrelation among variables in the experiment. Significantly, users’ type was correlated with community engagement ( $r=.268$ ,  $p<0.01$ ) only. Similarly, brand interactivity was correlated with community engagement ( $r=.337$ ,  $p<0.01$ ), knowledge contribution ( $r=.327$ ,  $p<0.01$ ) and brand co-creation ( $r=.386$ ,  $p<0.01$ ) respectively. In addition, the knowledge contribution was correlated with community engagement ( $r=.319$ ,  $p<0.05$ ) and brand interactivity ( $r=.327$ ,  $p<0.01$ ) respectively. The brand co-creation was correlated with community engagement ( $r=.392$ ,  $p<0.01$ ).

Table 3. Means, standard deviations, and intercorrelations.

Variables	Mean	SD	1	2	3	4	5	AVE	CR
UT	.508	.504	1						
CE	3.373	.707	.286*	1				0.484	0.775
BI	2.677	.863	.185	.337**	1			0.689	0.868
KC	3.191	.901	.150	.319*	.327**	1		0.563	0.777
BC	3.169	1.04	.172	.392**	.549**	.386**	1	0.792	0.919

Note: \* $p<0.05$ . \*\* $p<0.01$

### Hypothesis Testing

We also examined the causal effect of different user types on their intention of community engagement. According to the different two types of users, we found that for the poster they have a positive intention to engage in the knowledge sharing community by ANOVA analysis ( $p=0.023$ ). H1 was supported and the difference between two different types of users was presented in Figure 2.

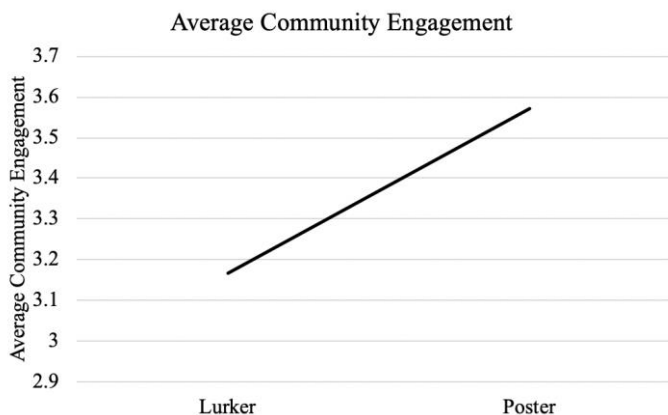


Figure 2. The Causal effect of user type on community engagement.

As for Hypothesis 2, we believed that when a brand engages in a virtual community, the intention of different users to participate will affect their knowledge contribution behavior and brand value co-creation. OLS method was used to test the hypothesis. According to results, we found that if we do not consider the influence of the brand, the influence of user type on their knowledge sharing behavior by community engagement intention is not significant (95% CI= [-1.836 .722] includes 0). However, when brands engage in the virtual community, the type of users will affect their intention to participate in the virtual community which will positively thus their knowledge contribution behavior (index of moderated mediation 95% CI= [.061 .999] excludes 0). So that the H2a was also supported. For H2b, we found that user types will affect their engagement intentions and the value co-creation behavior between them and the brand. However, the total effect of user type on brand value co-creation was not significant (total effect: 95% CI= [-.166 .875] includes 0; indirect effect: 95% CI= [.021 .534] excludes 0).

Table 4. The effect of user types on knowledge contribution and brand value co-creation.

Variables	Model 1	Model 2	Model 3	Model 4
	Knowledge Contribution		Brand Co-Creation	
User type	.115	-.007	.133	.064
Community Engagement	.383*	.500**	.004**	.583**
Brand		.048		.205
Brand × Community Engagement		.770*		.371
df	60	58	60	58
R <sup>2</sup>	.106	.188	.157	.181

Note: \* $p < .05$ . \*\* $p < .01$ .

When we considered the moderating effect of brand engagement, the interaction of brand and community engagement was not significant (index of moderated mediation 95% CI= [-.157 .862] includes 0). However, when the brand engages in the virtual community, the branding co-creation of different types of users is completely mediated by their intention to participate (95% CI= [.055 .942] excludes 0).

In Hypotheses 3, we argued that when brand engage in the virtual community, the brand interactivity will affect their behavior of knowledge sharing and brand value co-creation by their intention of community engagement. From Table 5, we also found that for the knowledge contribution behavior, the brand interactivity cannot promote people's value co-creation between users and the virtual community by affecting people's intention to engage. Although under the condition of a brand engagement, the interactivity of the brand can indirectly affect the user's knowledge contribution behavior through the user's intention to engage in the community (with the brand, the mediation 95% CI= [.085 .475] excludes 0), the moderation mediation is not significant (index of moderated mediation 95% CI= [-.045 440] includes 0). Therefore, brand interactivity will influence the knowledge contribution by user's community engagement intention when the brand has already engaged in the virtual community. For brand value co-creation, the results showed that brand interactivity has a direct effect on brand value co-creation of users in the virtual community (95% CI= [.330 .824] excludes 0). When considered the engagement of the brand in the virtual community, we found that there was no significant evidence showing that the brand interactivity will affect the brand value co-creation by their intentions of community

engagement (Index of moderated mediation effects 95% CI= [-.217 .330] includes 0). Hence, the H3a was supported while H3b was not supported.

Table 5. The effect of brand interactivity on knowledge contribution and brand value co-creation.

Variables	Model 5	Model 6	Model 7	Model 8
	Knowledge Contribution		Brand Co-Creation	
<b>Brand Interactivity</b>	.258	.183	.566***	.573***
<b>Community Engagement</b>	.301	.405*	.3431*	.308
<b>Brand</b>		.062		.253
<b>Brand × Community Engagement</b>		.644*		.003
<b>df</b>	60	58	60	58
<b>R<sup>2</sup></b>	.114	.213	.349	.181

Note: \*p < .05. \*\*p < .01. \*\*\*p < 0.001

## CONCLUSION

This paper focused on whether users will mind brand engagement in the virtual community. We explored how brand engagement affects the knowledge sharing behavior and brand value co-creation behavior of different types of users in the virtual community. Firstly, in the virtual community, different types of users have different intentions to engage. For the poster, the intention to participate in the virtual community is higher. In addition, when brands participate in virtual communities, different types of users will have different intentions to participate in the community, thereby promoting their knowledge contributions.

What's more, we also found that in the process of brand participation, interaction with the brand will positively affect the user's knowledge contribution by affecting the user's participation intention. Hence, we concluded that brand engagement in the virtual community will promote the knowledge sharing behavior of posters.

### Theoretical Implication

This paper explored the effect of brand engagement on users' intention to engage, knowledge contribution behavior, and brand value co-creation in a knowledge-sharing virtual community. Firstly, the result confirmed that different types of users have different intentions to participate in the virtual community (Akar & Mardikyan, 2018). For active community users, they are more willing to participate in the virtual community. Because in the virtual community, the poster can participate to express themselves and realize themselves (Shao, 2009). In addition, this study also expanded the influence mechanism that affects users' intention of their community engagement. Prior researches have focused on exploring the antecedents or outcomes of participating behaviors (Chan, Zheng, Cheung, Lee, & Lee, 2014). However, this paper discussed the impact of user types on their intention to participate in the virtual community, and after the brand participates, the community engagement intention of different types of users affects their knowledge sharing with the community or the value co-creative behavior with the brand.

Secondly, this paper determined that brand engagement will positively influence people's knowledge contribution behavior, and filled the research gap about users' community engagement behavior in non-brand virtual communities. We found that when brands participate in a knowledge-sharing virtual community, the poster will show a more active intention to participate in the community and make knowledge contributions to promote the development and operation of the community. In addition, we also confirmed that in the context of brand participation, the willingness of posters to participate in the virtual community has a positive impact on brand value co-creation.

However, this paper had also reached inconsistent conclusions with past research on brand value co-creation. Although current researches have different opinions on the impact of brand engagement behavior, some people believed that brand engagement promotes the interaction between brands and consumers, and promotes brand-related investments in focus consumers. But some people believe that the negative word of mouth spread by consumers may reduce the others participation (Alexander, Jaakkola, & Hollebeek, 2018; Bowden *et al.*, 2017; Naumann, Bowden, & Gabbott, 2017). However, this study believed that the interactivity of brands will positively affect the value co-creation between users and brands in the context of virtual community. The higher the brand's interactivity, the easier it is for users to be converted into loyal users, and they are more willing to pass on the positive WOM of the brand to achieve co-creation of brand value. But this research did not get significant data results. It may be because the brand's participation in the experimental scene does not effectively affect the brand's interactivity.

### Managerial Implication

The results of this paper have also positive implications for the brand influence of the currently popular non-brand community. Firstly, the results showed that users do not mind the participation of brands in knowledge-sharing communities. Even this brand participation behavior has a positive impact on promoting the operation of the virtual community. For brand managers, they can broaden the brand publicity channels to get closer to users through knowledge sharing and other behaviors, convert public domain



traffic in the virtual community into brand private domain traffic, and transform users in the virtual community into brand loyal users. Secondly, brands should pay more attention to the interaction with users in the virtual community. The research results of this paper showed that it is not the brands engagement that can have a positive impact on users' knowledge sharing behavior or brand value co-creation. Therefore, this article believed that brands should pay attention to participating in virtual communities. Thirdly, the research context of this research is a knowledge-sharing community. Users participating in this type of community prefer to collect information and share knowledge. The inspiration to managers is that in the future, brand marketing can focus on specific groups and adopt appropriate marketing activities according to the characteristics of different groups in the circle, such as LGBT groups.

### Limitation and Further Research

Although this study confirmed that users do not mind brand engagement in knowledge-sharing communities, we believed that this study has some limitations. First, the amount of data in this study is relatively small, with only 63 valid test data. We believed that more participants can be invited to participate in our experiment in the future. In addition, there are still many questions about the relevant research on brand value co-creation in this article. Future research can focus on how brands interact with users in the virtual community to effectively affect their brand value co-creation. Another point, we think that the amount of data in this paper can be expanded. In the future, we can obtain data of the users' participation behavior in a knowledge-sharing virtual community in real-time, and the user's participation behavior can be confirmed through second-hand data.

### ACKNOWLEDGMENT

This work was supported by the National Social Science Fund of China under Grant 20AZD059. The authors declare no conflict of interest.

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