

Impact of Interactivity on Brand Loyalty in Virtual Brand Communities: A Case of iPhone Communities in Henan Province – WeiPhone Communities

ShanShan Chong^{1*}, and Atiporn Gerduang²

Stamford International University, Thailand

**Corresponding Author. E-mail: 2431634590@qq.com^{1*}*

Received February 16, 2026; **Revised** April 6, 2026; **Accepted** April 18, 2026

Abstract

This study examines how interactivity within online brand communities influences brand loyalty, with community identity and customer engagement serving as dual mediators. Grounded in relationship marketing theory, a conceptual framework is developed wherein interactivity drives loyalty through pathways of psychological identification and deep participation. Analyzing data from 567 users of the “WeiPhone Forum” using Structural Equation Modeling, the results reveal that interactivity not only exerts a direct positive effect on brand loyalty but also indirectly enhances it via both mediators, forming a compound mediation mechanism wherein customer engagement plays a stronger mediating role. These findings extend relationship marketing theory from a consumer–brand dyad to a consumer–community–brand triadic framework. Practically, cultivating user loyalty requires strengthening community belonging through interactivity while designing deep–contact scenarios to elevate engagement.

Keywords: interactivity; brand loyalty; community identity; customer engagement

Introduction

This study is motivated by both practical and theoretical considerations. Practically, global mobile phone shipments reached 1.24 billion units in 2024, and intensifying competition and product homogenization have made brand loyalty a key competitive advantage, while virtual communities have become critical spaces for brand–consumer interaction. Theoretically, a review of online community, brand community, brand loyalty, interactivity, and customer engagement literature reveals four gaps: insufficient conceptualization of interactivity components in brand communities, inadequate integration of mobile phone industry innovation with social interaction research, limited exploration of customer engagement outcomes, and unclear mechanisms by which community and brand paths affect brand loyalty. To address these gaps, this study takes the WeiPhone Forum as a case and constructs a model in which social interaction—divided into interpersonal and human–computer interaction—influences brand loyalty through community identity and customer engagement as mediators, offering practical guidance for mobile phone brand community operations.

Research Objectives

This study establishes the following five specific objectives:

1. Study the impact of social interaction on community identity
2. Study the impact of social interaction on customer engagement
3. Study the impact of community identity on brand loyalty
4. Study impact of customer engagement on brand loyalty
5. Study the mediating effects: community identity and customer engagement

Literature Review

Social interaction theory: Social interaction refers to the dynamic process in which the preferences, and behaviors of decision–making subjects are influenced by other subjects, emphasizing the social of individual behavior decisions and breaking through the limitations of the "atomic" personality assumption in classical economics (Durlauf & Ioannides, 2010).

Brand community: It refers to an interactive group composed of brands, consumers, and other stakeholders. Members gather based on common interests, emotions, or values towards the brand and possess three major characteristics: common consciousness, ritual conventions, and ethical responsibility (Muniz & O’Guinn, 2001).

Social interaction: It includes both two-way communication between consumers and brand owners and two-way communication among consumers. Active interaction within the community can enhance consumers' brand identification and loyalty through positive promotion. The strength of the relationship between consumers and organizations directly affects their continuous purchase behavior (Bhattacharya & Sen, 2003).

Brand loyalty: It refers to the tendency of consumers to form preferences for a certain brand and attempt to repeat purchases. It can be divided into behavioral loyalty, customers repeated purchases; attitudinal loyalty customers purchase intention and recommendation intention; and brand loyalty, customers tendency to resist competing brands; Algesheimer et al. (2005) suggest that brand community identity can promote consumers' community participation, thereby influencing their brand loyalty intentions.

Community identity: Derived from social identity theory, it refers to the degree to which consumers perceive themselves as members of the community, develop emotional attachment to the community. Krackhardt (1992) pointed out that the richer the interaction experience, the stronger the community characteristics among members. Muniz and O'Guinn (2001) emphasized that social interaction is a key factor for the success of the community, which can enhance the connection and identification among members.

Customer engagement: It refers to the psychological state generated by customers during the interaction process with the brand and other stakeholders, manifested as cognitive, emotional, and behavioral engagement, including participation, interaction, and other non-transactional behaviors. Members' strong perception of social interaction can increase their involvement, trigger trust and reciprocal behaviors, and generate a sense of belonging and community engagement (Labrecque, 2014).

Based on this, the following hypotheses are proposed:

H1: Social interaction has a direct impact on brand loyalty.

H2: Social interaction has a direct impact on community identity.

H3: Social interaction has a direct impact on customer engagement.

H4: Community identity has a direct impact on brand loyalty.

H5: Customer engagement has a direct impact on brand loyalty.

The Mediating Role of Perceived Trust

Based on the above relationship, social interaction indirectly affects brand loyalty by enhancing community identity and customer engagement. Community identity makes members

feel a sense of belonging, and this psychological state promotes customers' recognition of the community and the brand; customer engagement, on the other hand, strengthens brand connection through deep participation. Therefore, it is proposed these hypothesis.

H6: Community identity has a mediating effect between social interaction and brand loyalty;

H7: Customer engagement has a mediating effect between social interaction and brand loyalty.

Conceptual Framework

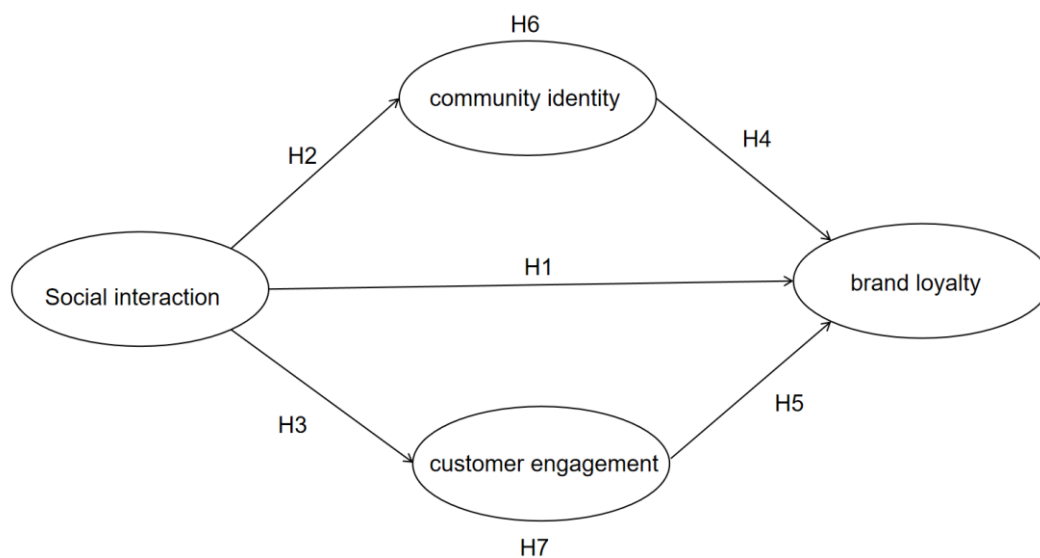


Figure 1 Conceptual Framework

Research Methodology

Sample and data collection

This study targeted registered members of "WeiPhone Forum," the largest Apple fan community in China, as the survey respondents. Data were collected using random sampling method. The questionnaire included four core variables: social interaction, community identity, customer engagement, and brand loyalty, comprising a total of 24 measurement items, measured on a five-point Likert scale. Data collection was conducted online via the "Wenjuanxing" platform, a convenience sampling approach was adopted. The survey period ran from September 1 to November 30, 2025. A total of 625 questionnaires were collected. After screening out responses

with excessively short completion times and invalid samples, 567 valid questionnaires were obtained, resulting in a valid response rate of 90.7%.

Measures

Based on the literature review, this paper adopts a quantitative research method and designs a questionnaire using the Likert five-point scale (Likert, 1932). The questionnaires in this study are all adapted from previous mature scales. The scales used in this study were adapted from established research. Social interaction is based on Dholakia et al. (2004). Community identity draws from Kim et al. (2001), and Algesheimer et al. (2005). Customer engagement combines Algesheimer et al. (2005), and Hollebeek et al. (2014). Brand loyalty is adapted from Dick and Basu (1994), and Hickman and Ward (2007). All scales were adjusted for the online community context, and their reliability and validity were confirmed through pilot testing. The questionnaire was finally approved by the STIU–HREC012/2026 ethical review certification.

Data analysis

SPSS 26.0 was used first for descriptive statistical analysis to provide auxiliary verification for the subsequent analysis. and AMOS 28.0 is used for data statistical analysis test the hypotheses.

Research Results

Sample Characteristics

From Table 1, The data shows that the sample is predominantly composed of users aged 20–29 (58.7%) with bachelor's degrees (50.1%), and gender distribution is balanced (48.7% male, 51.3% female). In terms of community participation, most users have been registered for less than two years (79.4%), log in 1–2 times per week (61.7%), spend less than one hour per visit (50.6%), and post 1–5 times weekly (64.9%). The largest group consists of those who “browse almost daily but never post/reply” (38.6%). Additionally, nearly half of the users have used Apple smartphones for less than one year (47.3%), though most have extensive smartphone experience, 73.6% have used smartphones for over three years. Overall, the sample depicts an online brand community characterized by a young, highly educated user base with active yet significantly stratified levels of participation.

Table1 Descriptive statistical analysis

Variable	Categories	Frequencies	Percentage
Gender	Man	276	48.7%
	Woman	291	51.3%
Age	20–29	333	58.7
	30–39	104	18.3
	40–49	73	12.9
	50 and above	57	10.1
Education Level	Senior high school and below	41	7.2
	Junior college	177	31.2
	Bachelor's degree	284	50.1
	Master's degree and above	65	11.5
Occupation	Government and public institution employees	56	9.9
	Enterprise employees	125	22.0
	Professionals (teachers, doctors, lawyers)	76	13.4
	Ordinary worker	70	12.3
	Private entrepreneur / individual business owner	26	4.6
	Farmers/Nomads	15	2.6
	Employees in the commercial service industry	26	4.6
	Freelancer	24	4.2
	Housewife	34	6.0
	Student	70	12.3
Length of Registration on Weiphone Forum	Under 1 year	239	42.2
	1 to 2 years	211	37.2
	More than two years	117	20.6
Average weekly loginto the WeiFeng	Less than once	97	17.1
	1 to 2 times	350	61.7
	More than twice	120	21.2
Average duration visit the WeiFeng	Less than an hour	287	50.6
	1 to 2 hours	202	35.6
	More than two hours	78	13.8
Weekly posting fon the WeiFeng website	0 times	150	26.5
	1 to 5 times	368	64.9
	More than five times	49	8.6
Length of iphone usage	Less than one year	268	47.3
	1 to 2 years	166	29.3
	2 to 3 years	63	11.1
	More than 3 years	70	12.3

Variable	Categories	Frequencies	Percentage
Participant types	Often posting/replying, contributing significantly	159	28.0
	Occasionally posts, but often replies, contributes a bit	205	36.2
	Basically browsing every day, never posting, occasionally replying.	91	16.0
	Often browse, never post/reply.	61	10.8
	Occasionally browsing, never posting/replying.	51	9.0
Total		567	100%

Reliability and Validity Analysis

Table 2 Reliability and Validity

Variable	Cronbach's alpha)	Composite reliability (rho_c)	Average variance extracted (AVE)
SI	0.887	0.881	0.574
CI	0.888	0.888	0.573
CE	0.894	0.926	0.587
BL	0.879	0.902	0.548

Note: SI= Social interaction; CI=Community identity; CE=Customer Engagement; BL= Brand Loyalty;

The evaluation standards for reliability coefficients mainly refer to the classic framework proposed by Nunnally (1978) in the revised edition of *Psychometric Theory*. This framework has been supplemented and improved by subsequent scholars, forming an authoritative consensus widely recognized in the academic circle (Hair et al., 2010; Kline, 2016). The Cronbach's α coefficient is between 0 and 1. If is greater than 0.7, it indicates that its internal consistency is high and the quality of the index system is good.

Table 3 Discriminant Validity

	1	2	3	4
SI	0.758			
CI	0.504	0.757		
CR	0.487	0.444	0.766	
BL	0.542	0.574	0.591	0.740

Note: SI= Social interaction; CI=Community identity; CE=Customer Engagement; BL= Brand Loyalty;

Hypothesis Tests

Before testing the hypotheses, the researchers examined the goodness-of-fit of both the measurement model and the structural model. The findings indicated that the fit indices met the recommended criteria ($\chi^2/df = 2.45$, CFI = 0.95, TLI = 0.94, RMSEA = 0.05, SRMR = 0.04), which are within the acceptable thresholds suggested by Hair et al. (2010).

Table 4 Research hypothesis path test

Hypothesis	Path	Unstandardized Path Coefficient(B)	Standardized Path Coefficient(β)	Standard Error (S.E.)	Critical Ratio (C.R.)	P values	Results
H1	SI → BL	0.192	0.214	0.047	4.069	0.000	Supported
H2	SI → CI	0.446	0.521	0.044	10.115	0.000	Supported
H3	SI → CE	0.527	0.503	0.051	10.236	0.000	Supported
H4	CI → BL	0.336	0.321	0.051	6.561	0.000	Supported
H5	CE → BL	0.307	0.358	0.041	7.427	0.000	Supported

Note: SI= Social interaction; CI=Community identity; CE=Customer Engagement; BL= Brand Loyalty;

The path analysis results of this study indicate that all five hypotheses are supported. Specifically, social interaction not only has a direct positive impact on brand loyalty but also significantly and positively influences community identity and customer engagement. Both community identity and customer engagement, in turn, strongly and directly promote brand loyalty. In terms of effect sizes, social interaction has the greatest impact on community identity, while customer engagement exhibits the strongest direct effect on brand loyalty. These findings collectively reveal a clear mechanism: active interaction within online brand communities can effectively foster brand loyalty by strengthening members' identity and deepening their engagement.

Mediation Effects

Table 5 Mediation Effect Checklist

Effect Type	Effect Value	SE	95% Confidence Interval	
			LLCI	ULCI
Total Effect	0.561	0.044	0.474	0.647
Direct Effect	0.214	0.061	0.096	0.340
Total Indirect Effect	0.347	0.041	0.273	0.431
H6: Indirect Effect via Community identity	0.167	0.033	0.109	0.240
H7: Indirect Effect via Customer Engagement	0.180	0.037	0.113	0.262

This study further examined the mediating roles of community identity and customer engagement in the relationship between social interaction and brand loyalty to test Hypotheses H6 and H7. The detailed results are presented in Table 5.

Discussion

The findings reveal that social interaction exerts a significant direct positive effect on brand loyalty ($\beta = 0.214$, $p < 0.001$), confirming that interaction alone can foster loyalty without relying solely on mediators. Social interaction also positively affects community identity ($\beta = 0.521$) and customer engagement ($\beta = 0.503$), which in turn each significantly enhance brand loyalty ($\beta = 0.321$ and 0.358 , respectively). Moreover, both community identity and customer engagement serve as significant mediators, with indirect effects of 0.167 and 0.180, respectively, revealing a dual-pathway mechanism wherein sustained interaction cultivates belonging and identity that ultimately extend to the brand.

These findings both support and extend prior research. In line with Muniz and O’Guinn (2001), the results reaffirm that social interaction serves as a foundational element of brand communities. Furthermore, while Algesheimer et al. (2005) identified community engagement as a key outcome of brand community influence, the present study advances this understanding by positioning customer engagement—and to a lesser extent community identity—as critical mediators in the link between interaction and brand loyalty. This suggests that it is not merely the act of participating, but the psychological state of engagement and the sense of belonging that most powerfully translate interaction into loyalty. By doing so, the study extends relationship marketing theory from a traditional “consumer–brand” dyadic perspective to a “consumer–community–brand” triadic interaction framework.

Despite the theoretical and practical contributions outlined above, several limitations should be acknowledged. First, the cross-sectional design precludes strong causal inferences; future research could adopt a longitudinal approach to better establish causal order. Second, the study was conducted within a single brand community, the WeiPhone Forum, which may limit generalizability, suggesting a need for comparative studies across diverse community contexts. Third, the use of self-report measures may introduce common method bias, highlighting the value of incorporating objective behavioral indicators—such as posting frequency or transaction records—in future research. Addressing these limitations would not only strengthen the robustness of the

conclusions but also deepen understanding of the mechanisms through which social interaction cultivates brand loyalty.

New Knowledge from Research

The most significant finding of this study is the validation of a composite transmission mechanism characterized by "direct effect + dual mediating effects." Here, the mediating effect of customer engagement (0.180) is slightly stronger than that of community identity (0.167). This subtle difference carries important theoretical implications. It suggests that, within online brand communities, the emotional connection and behavioral investment formed between users and the brand through deep interaction are more effective in driving brand loyalty than the sense of belonging to the community alone. This finding provides a valuable supplement to relationship marketing theory by shifting the research perspective from the traditional "consumer–brand" dyadic relationship to a "consumer–community–brand" triadic interaction framework.

Conclusions

Social interaction is the fundamental driving force for the formation of brand loyalty. It not only has a significant positive direct effect on brand loyalty but also indirectly promotes brand loyalty through the mediating roles of community identity and customer engagement, forming a composite transmission mechanism of "direct effect + dual mediating effects." Community identity and customer engagement are the key psychological mechanisms that explain how social interaction translates into brand loyalty. Social interaction enhances members' sense of belonging and identity within the community, which in turn extends to the brand, creating a "our brand" psychological effect. The mediating effect of customer engagement is slightly stronger than that of community identity. This suggests that the emotional connection and behavioral investment formed between users and the brand through deep interaction are more effective in driving brand loyalty than a mere sense of belonging to the community. This finding expands the perspective of relationship marketing from the traditional "consumer–brand" dyadic relationship to a "consumer–community–brand" triadic interaction framework, deepening the theoretical understanding of value creation mechanisms in online brand communities.

Suggestions

For business practice, the insight is clear: community operations should not merely focus on creating a lively discussion atmosphere. Instead, they must design interaction mechanisms that strengthen direct contact between users and the brand, such as new product trials, technical Q&A sessions, and brand storytelling thereby maximizing the commercial value of social interaction by enhancing customer engagement. This study provides clear guidance for businesses in operating online brand communities. First, social interaction serves as the starting point for cultivating brand loyalty. Companies should establish diverse interaction mechanisms, encourage knowledge sharing among members, and actively participate in discussions. Second, community identity acts as a key bond for deepening relationships. Businesses can enhance members' sense of belonging and identity by introducing membership tiers, awarding exclusive badges, and organizing both online and offline events, thereby transforming "brand users" into "community family members." Finally, Companies should design in-depth interactive experiences, such as new product trial programs, technical salons, and brand storytelling co-creation activities, allowing users to build emotional connections and cognitive investment through direct engagement with the brand. This approach maximizes the transformation of community activity into brand loyalty.

References

- Algesheimer, R., Dholakia, U. M., & Herrmann, A. (2005). The social influence of brand community: Evidence from European car clubs. *Journal of Marketing*, 69(3), 19–34. <https://doi.org/10.1509/jmkg.69.3.19.66363>
- Bhattacharya, C. B., & Sen, S. (2003). Consumer–company identification: A framework for understanding consumers' relationships with companies. *Journal of Marketing*, 67(2), 76–88. <https://doi.org/10.1509/jmkg.67.2.76.18609>
- Dholakia, U. M., Bagozzi, R. P., & Pearo, L. K. (2004). A social influence model of consumer participation in network– and small–group–based virtual communities. *International Journal of Research in Marketing*, 21(3), 241–263. <https://doi.org/10.1016/j.ijresmar.2003.12.004>
- Dick, A. S., & Basu, K. (1994). Customer loyalty: Toward an integrated conceptual framework. *Journal of the Academy of Marketing Science*, 22(2), 99–113. <https://doi.org/10.1177/0092070394222001>

- Durlauf, S. N., & Ioannides, Y. M. (2010). Social interactions. *Annual Review of Economics*, 2(1), 451–478.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Pearson Education.
- Hickman, T., & Ward, J. (2007). The dark side of brand community: Inter-group stereotyping, trash talk, and schadenfreude. *Advances in Consumer Research*, 34, 314–319.
- Hollebeek, L. D., Glynn, M. S., & Brodie, R. J. (2014). Consumer brand engagement in social media: Conceptualization, scale development and validation. *Journal of Interactive Marketing*, 28(2), 149–165. <https://doi.org/10.1016/j.intmar.2013.12.002>
- Kim, C. K., Han, D., & Park, S. B. (2001). The effect of brand personality and brand identification on brand loyalty: Applying the theory of social identification. *Japanese Psychological Research*, 43(4), 195–206. <https://doi.org/10.1111/1468-5884.00177>
- Kline, R. B. (2016). *Principles and practice of structural equation modeling*. Guilford.
- Krackhardt, D. (1992). The strength of strong ties: The importance of philosophy in organizations. In N. Nohria & R. G. Eccles (Eds.), *Networks and organizations: Structure, form, and action* (pp. 216–239). Harvard Business School.
- Labrecque, L. I. (2014). Fostering consumer–brand relationships in social media environments: The role of parasocial interaction. *Journal of Interactive Marketing*, 28(2), 134–148. <https://doi.org/10.1016/j.intmar.2013.12.003>
- Likert, R. (1932). A technique for the measurement of attitudes. *Archives of Psychology*, 22(140), 1–55.
- McAlexander, J. H., Schouten, J. W., & Koenig, H. F. (2002). Building brand community. *Journal of Marketing*, 66(1), 38–54. <https://doi.org/10.1509/jmkg.66.1.38.18451>
- Muniz, A. M., Jr., & O’Guinn, T. C. (2001). Brand community. *Journal of Consumer Research*, 27(4), 412–432. <https://doi.org/10.1086/319618>
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). McGraw–Hill.