

The Impact of Environmental, Social, Governance, and Innovation Factors on the Sustainable Competitiveness of Chinese Private Universities

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ABSTRACT

This study takes private universities in Xi'an, China, as the research object and explores how environmental, social, and governance factors, together with innovation capability, influence the sustainable competitiveness of private universities through brand building. Based on the Resource-Based View, Stakeholder Theory, Dynamic Capability Theory, and Brand Equity Theory, this study constructs a theoretical model linking environmental, social, governance, and innovation capability with brand image, brand competitiveness, and sustainable competitiveness. A quantitative research method was adopted, and data were collected through a questionnaire survey. A total of 550 questionnaires were distributed, of which 527 valid responses were obtained. Descriptive statistics, reliability and validity tests, exploratory factor analysis, confirmatory factor analysis, structural equation modeling, and mediation effect analysis were employed for empirical testing. The results indicate that environmental, social, and governance factors have positive effects on brand image, while innovation capability significantly promotes brand competitiveness. In addition, brand image and brand competitiveness positively affect the sustainable competitiveness of private universities. Brand building plays a crucial mediating role between environmental, social, governance, innovation capability, and sustainable competitiveness. The findings suggest that, in order to enhance long-term competitive advantages, private universities should integrate green development, social responsibility, governance optimization, and innovation-driven development into their brand strategies. This study not only enriches the theoretical perspectives on brand building and sustainable competitiveness in private universities, but also provides practical implications for the high-quality and sustainable development of private universities in China.

KEYWORDS

Private Universities; Environmental, Social, and Governance (ESG); Innovation Capability; Brand Image; Brand Competitiveness; Sustainable Competitiveness.

1. INTRODUCTION

In the context of globalization, digital transformation, and intensified competition in higher education, private universities are facing growing pressure to secure enrolment, maintain financial stability, improve institutional reputation, and achieve long-term sustainability. Compared with public universities, private higher education institutions are usually more dependent on tuition revenue and are therefore more vulnerable to shifts in student demand, policy environments, and market competition. As a result, sustainable competitiveness has become a strategic concern for private universities, especially in rapidly developing educational markets such as China. Existing scholarship suggests that, to remain viable and distinctive, private universities must go beyond traditional enrolment-centered strategies and adopt broader approaches that integrate sustainability, reputation

management, governance improvement, and innovation-driven development (Maringe & Foskett, 2022; Sachs et al., 2023; Marginson, 2021).

Against this background, the concept of environmental, social, and governance (ESG) has gradually expanded from the corporate and investment sectors into the field of higher education. ESG provides a comprehensive framework for evaluating how institutions respond to environmental sustainability, social responsibility, and governance quality. In the university context, the environmental dimension may include green campus initiatives, energy conservation, and sustainable resource management; the social dimension covers inclusion, equity, community engagement, and student well-being; and the governance dimension emphasizes transparency, accountability, ethical leadership, and effective decision-making. These dimensions are increasingly associated with the broader global agenda of sustainable development and with the expectations of students, parents, employers, and society at large (United Nations, 2023; ElAlfy et al., 2021; Adams et al., 2022). For private universities, ESG is not only a moral or policy issue but also a strategic resource that can strengthen stakeholder trust and enhance institutional legitimacy.

At the same time, innovation capability has emerged as another critical factor shaping the future of private universities. Innovation in curriculum design, digital teaching, smart campus management, interdisciplinary research, and entrepreneurial ecosystems allows universities to respond more effectively to changing market needs and societal expectations. In resource-constrained environments, innovation can help private institutions improve efficiency, expand access, and differentiate themselves from competitors. Recent discussions in the literature indicate that innovation is especially important for private higher education institutions because it supports not only teaching and research quality but also institutional adaptability and brand differentiation (Carayannis et al., 2021; Guerrero et al., 2022; Chin et al., 2023). When linked with ESG practices, innovation may further amplify the institution's ability to present itself as responsible, forward-looking, and socially valuable.

Brand building therefore becomes a crucial connecting mechanism. In higher education, brand image and brand competitiveness influence how universities are perceived by prospective students, current students, faculty, alumni, industry partners, and the public. A strong brand can support student recruitment, external partnerships, and long-term institutional resilience. Prior research has shown that sustainability commitments, governance quality, and innovation efforts all contribute to more favorable stakeholder perceptions and stronger brand equity (Foroudi et al., 2021; Pinar et al., 2021; Chapleo & Simms, 2023). For private universities, which often face persistent skepticism regarding academic quality and institutional prestige, brand building is especially significant. ESG-oriented practices and innovation capability can help these institutions construct a more credible and differentiated image in a highly competitive education market.

However, despite the increasing relevance of ESG, innovation, and branding in higher education, the existing literature still reveals an important gap. Much of the previous research has focused either on corporations or on public universities in Western contexts, while relatively limited attention has been paid to Chinese private universities. In particular, there is insufficient empirical evidence on how ESG dimensions and innovation capability jointly influence brand image, brand competitiveness, and, ultimately, sustainable competitiveness in private higher education institutions. This gap is important because Chinese private universities operate under distinctive conditions, including strong market competition, financial constraints, regulatory pressures, and growing stakeholder expectations. Therefore, examining the relationship among ESG, innovation capability, brand building, and sustainable competitiveness is both theoretically meaningful and practically necessary..

2. LITERATURE REVIEW

The concept of sustainable competitiveness in higher education, particularly for private universities, has received increasing scholarly attention in recent years. Sustainable competitiveness refers to the

capacity of universities to maintain long-term development advantages by effectively integrating internal resources, institutional strategies, and external environmental changes. For private universities, this involves not only improving teaching quality and institutional reputation but also strengthening stakeholder relationships and enhancing adaptability to market dynamics (Salmi, 2021; Hazelkorn, 2022).

A key pathway toward sustainable competitiveness lies in the adoption of environmental, social, and governance (ESG) principles. ESG frameworks have gradually been incorporated into higher education management as institutions seek to align with global sustainability agendas. In terms of environmental sustainability, universities are expected to implement green campus policies, optimize energy consumption, and promote sustainable resource use. Studies indicate that environmentally responsible practices can significantly enhance institutional legitimacy and public trust (Findler et al., 2021). Social sustainability, on the other hand, emphasizes equity, diversity, inclusion, and community engagement. Universities that actively promote social responsibility tend to attract students with stronger value alignment, thereby reinforcing institutional attractiveness and brand perception (Leal Filho et al., 2022). Governance sustainability further highlights the importance of transparency, accountability, and ethical leadership, which are essential for building long-term stakeholder confidence (Bice & Coates, 2023).

Although the relationship between ESG practices and organizational reputation has been widely examined in corporate contexts, research within higher education remains relatively underdeveloped. Nevertheless, emerging studies suggest that ESG initiatives can significantly influence university brand image by shaping stakeholder perceptions and institutional credibility (Alam et al., 2022). A strong brand image is particularly important for private universities, which often rely heavily on market-based mechanisms for survival and growth. Effective brand management enables universities to differentiate themselves and enhance their competitive positioning in increasingly saturated education markets (Ivy & Singh, 2021). Consequently, ESG practices serve not only as operational strategies but also as branding tools that contribute to sustainable competitiveness.

In addition to ESG factors, innovation capability plays a crucial role in strengthening sustainable competitiveness. Innovation in higher education encompasses digital transformation, pedagogical reform, interdisciplinary research, and organizational flexibility. Recent studies emphasize that universities with higher innovation capacity are more capable of responding to rapid technological changes and evolving student demands (Bond et al., 2022). Moreover, innovation enhances institutional resilience by enabling universities to adapt to uncertain environments and maintain operational continuity (Cai & Ahmad, 2023). As a result, innovation capability is widely recognized as a fundamental driver of both institutional performance and long-term competitiveness.

Brand competitiveness also serves as a key mechanism linking ESG practices and innovation capability to sustainable competitiveness. It reflects a university's ability to establish a distinctive and attractive identity in the higher education market. A competitive brand can improve student recruitment outcomes, strengthen partnerships, and increase financial sustainability. Empirical evidence suggests that universities with strong brand differentiation are more likely to achieve long-term growth and stakeholder loyalty (Dennis et al., 2021). For private universities in particular, brand competitiveness is essential for overcoming structural disadvantages and achieving sustainable development.

Recent research has increasingly focused on the interaction among ESG, innovation, and brand competitiveness. Scholars argue that ESG initiatives and innovation practices are mutually reinforcing, with innovation enhancing the effectiveness of sustainability strategies and ESG strengthening institutional legitimacy (Cai & Ahmad, 2023). This synergy is especially important for private universities, which must rely on differentiation strategies to compete with publicly funded institutions. In this context, an integrated approach that combines ESG practices, innovation

capability, and strategic brand management is considered essential for achieving sustainable competitiveness in higher education (Alam et al., 2022).

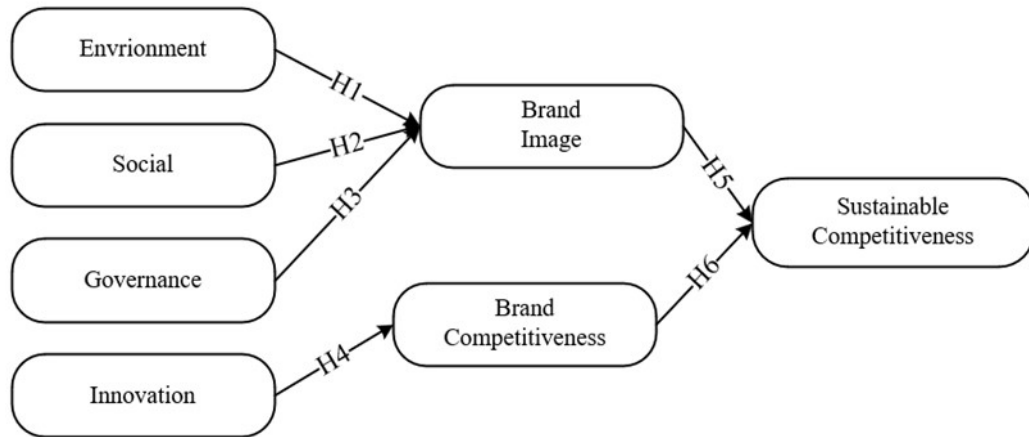


Figure 1. Conceptual framework

Based on the conceptual framework, this study proposes that environmental, social, and governance factors influence the sustainable competitiveness of private universities through brand image, while innovation influences sustainable competitiveness through brand competitiveness.

H1: Environment has a significant positive effect on brand image.

H2: Social factors have a significant positive effect on brand image.

H3: Governance has a significant positive effect on brand image.

H4: Innovation has a significant positive effect on brand competitiveness.

H5: Brand image has a significant positive effect on sustainable competitiveness.

H6: Brand competitiveness has a significant positive effect on sustainable competitiveness.

3. RESEARCH METHODOLOGY

This study employs a quantitative research design to explore the relationships between environmental, social, and governance (ESG) factors, innovation capability, and the sustainable competitiveness of private universities, with a focus on the mediating roles of brand image and brand competitiveness. The research is conducted through a survey methodology, using a structured questionnaire to collect primary data from stakeholders within private universities in Xi'an, China, including administrators, faculty members, and relevant staff.

The questionnaire is designed to capture respondents' perceptions and experiences related to ESG practices, innovation capabilities, brand image, brand competitiveness, and sustainable competitiveness. The items are adapted from existing scales in the literature to ensure validity and reliability. The data collected will be analyzed using descriptive statistics to summarize the general characteristics of the sample and to identify key trends. Additionally, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) will be used to assess the validity of the measurement model. Structural equation modeling (SEM) will be employed to test the proposed relationships between the variables and to examine the mediating effects of brand image and brand competitiveness.

This methodology provides a comprehensive approach to analyzing the factors influencing sustainable competitiveness in private universities and contributes valuable empirical insights into the field of higher education management.

4. DATA ANALYSIS

The data provides a breakdown of the sample's demographic characteristics. Regarding gender, 56.93% of the respondents are male, while 43.07% are female. In terms of age, the majority (49.53%) are between 18-20 years old, followed by 33.59% who are above 20, and 16.89% are below 18. As for the place of origin, 55.41% of respondents come from rural areas (country), while 44.59% are from urban areas (city). These demographics offer insights into the sample's composition, which is diverse in terms of gender, age, and place of origin.

Table 1. Descriptive Analysis of Demographics

Items	Options	Frequency	Percentage(%)
Gender	Female	227	43.07
	Male	300	56.93
Age	18-20	261	49.53
	Above 20	177	33.59
	Below 18	89	16.89
Place of origin	City	235	44.59
	Country	292	55.41
Total		527	100

4.1 Reliability Test

The reliability of the measurement scales in this study was assessed using Cronbach's alpha to determine the internal consistency of each construct. In general, a Cronbach's alpha value above 0.70 is considered acceptable, indicating that the items within a construct are measuring the same concept consistently. The results show that all constructs achieved satisfactory reliability, with Cronbach's alpha values ranging from 0.803 to 0.933. This indicates that the questionnaire had a strong level of internal consistency and was suitable for further statistical analysis.

4.2 Exploratory Factor Analysis (EFA)

Table 2. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.909
Bartlett's Test of Sphericity	Approx. Chi-Square	10497.331
	df	496
	Sig.	.000

The KMO value is 0.909, which is well above the recommended threshold of 0.70, indicating that the sample is adequate for factor analysis. In addition, Bartlett's Test of Sphericity is significant ($\chi^2 = 10497.331$, $df = 496$, $p = .000$), showing that the correlation matrix is not an identity matrix and that the variables are sufficiently correlated. These results confirm that the data are suitable for exploratory

factor analysis and provide a strong statistical basis for further validity testing of the measurement scale.

Table 3. Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.382	29.319	29.319	9.382	29.319	29.319	3.971	12.408	12.408
2	3.294	10.293	39.612	3.294	10.293	39.612	3.841	12.003	24.411
3	2.945	9.204	48.817	2.945	9.204	48.817	3.618	11.306	35.716
4	2.532	7.912	56.728	2.532	7.912	56.728	3.368	10.526	46.242
5	2.187	6.834	63.562	2.187	6.834	63.562	2.846	8.893	55.135
6	1.485	4.641	68.204	1.485	4.641	68.204	2.822	8.819	63.955
7	1.173	3.665	71.869	1.173	3.665	71.869	2.533	7.914	71.869
8	.619	1.936	73.805						
9	.604	1.887	75.692						
10	.569	1.779	77.470						
11	.529	1.655	79.125						
12	.511	1.598	80.723						
13	.477	1.489	82.212						
14	.431	1.348	83.560						
15	.413	1.291	84.851						
16	.398	1.243	86.094						
17	.384	1.200	87.294						
18	.373	1.166	88.460						
19	.351	1.097	89.557						
20	.345	1.079	90.636						
21	.334	1.043	91.679						
22	.310	.969	92.648						
23	.301	.940	93.588						
24	.267	.835	94.423						
25	.263	.821	95.244						
26	.255	.797	96.042						
27	.249	.777	96.819						
28	.241	.752	97.571						
29	.219	.685	98.255						
30	.207	.647	98.903						
31	.189	.591	99.494						
32	.162	.506	100.000						

In the table 3, The results show that seven common factors were extracted, with eigenvalues all greater than 1, indicating that the factor structure is meaningful and suitable for explaining the relationships among the measurement items. Before rotation, the seven factors together accounted for 71.869% of the total variance, which exceeds the commonly accepted standard of 60%, suggesting that the extracted factors have strong explanatory power. After rotation, the variance explained by each factor became more balanced, with contribution rates ranging from 7.914% to 12.408%. This indicates that the factor structure is clearer and more interpretable after rotation. The cumulative variance explained remains unchanged at 71.869%, further confirming that the extracted factors can effectively represent most of the information contained in the original variables. Overall, these findings demonstrate that the scale has a good structural foundation and that the extracted factors are appropriate for subsequent factor interpretation and construct validity analysis.

4.3 Confirmatory Factor Analysis (CFA)

Confirmatory factor analysis (CFA) is mainly used to test whether the hypothesized factor structure is consistent with the actual data (Byrne, 2013; Brown, 2015). the fit value is up to standard

4.4 AVE and CR

The convergent validity results indicate that all constructs in this study have acceptable to strong measurement quality. First, the standardized factor loadings of all observed items range from 0.647 to 0.867, all exceeding the commonly accepted threshold of 0.50, which shows that each item can adequately reflect its corresponding latent construct. In addition, all path coefficients are statistically significant at $p < 0.001$, further confirming that the relationships between observed variables and latent variables are stable and meaningful. Regarding the AVE values, Environment (0.686), Social (0.737), Governance (0.636), Innovation (0.567), Brand Image (0.606), Brand Competitiveness (0.657), and Sustainable Competitiveness (0.511) all exceed the recommended benchmark of 0.50, indicating that each construct explains more than half of the variance of its indicators and therefore demonstrates good convergent validity. At the same time, the composite reliability (CR) values range from 0.806 to 0.933, all above the standard value of 0.70, suggesting high internal consistency and satisfactory construct reliability. Among these variables, Social shows the strongest convergent validity and reliability, while Sustainable Competitiveness, although relatively lower than the other constructs, still meets the acceptable criteria. Overall, these results confirm that the measurement model has good convergent validity and reliability, providing a solid foundation for further structural model analysis.

4.5 Discriminant Validity

Table 4. Discriminant Validity

	Environment	Social	Governance	Innovation	Brand Image	Brand Competitiveness	Sustainable Competitiveness
Environment	0.828						
Social	0.344	0.858					
Governance	0.123	0.191	0.797				
Innovation	0.193	0.278	0.121	0.753			
Brand Image	0.249	0.392	0.176	0.33	0.779		
Brand Competitiveness	0.374	0.357	0.243	0.372	0.578	0.811	
Sustainable Competitiveness	0.317	0.379	0.318	0.35	0.414	0.478	0.715

Note: The numbers on the diagonal are the square root of AVE.

Based on the results presented in the table4, the square root of the Average Variance Extracted (AVE) for each construct-represented by the values along the diagonal-exceeds its correlation coefficients with all other constructs. This indicates that the discriminant validity among all constructs has been well established. Specifically, the diagonal values for the respective constructs range from 0.715 to 0.858, each surpassing the correlation coefficients within its corresponding row and column, thereby demonstrating strong distinctiveness among the constructs.

5. STRUCTURAL EQUATION MODELING (SEM)

Structural Equation Modeling (SEM) is a multivariate statistical analysis method, characterized by its ability to handle latent variables (unobserved variables) and estimate multiple dependencies simultaneously. Please refer to Figure 2 for the specific model

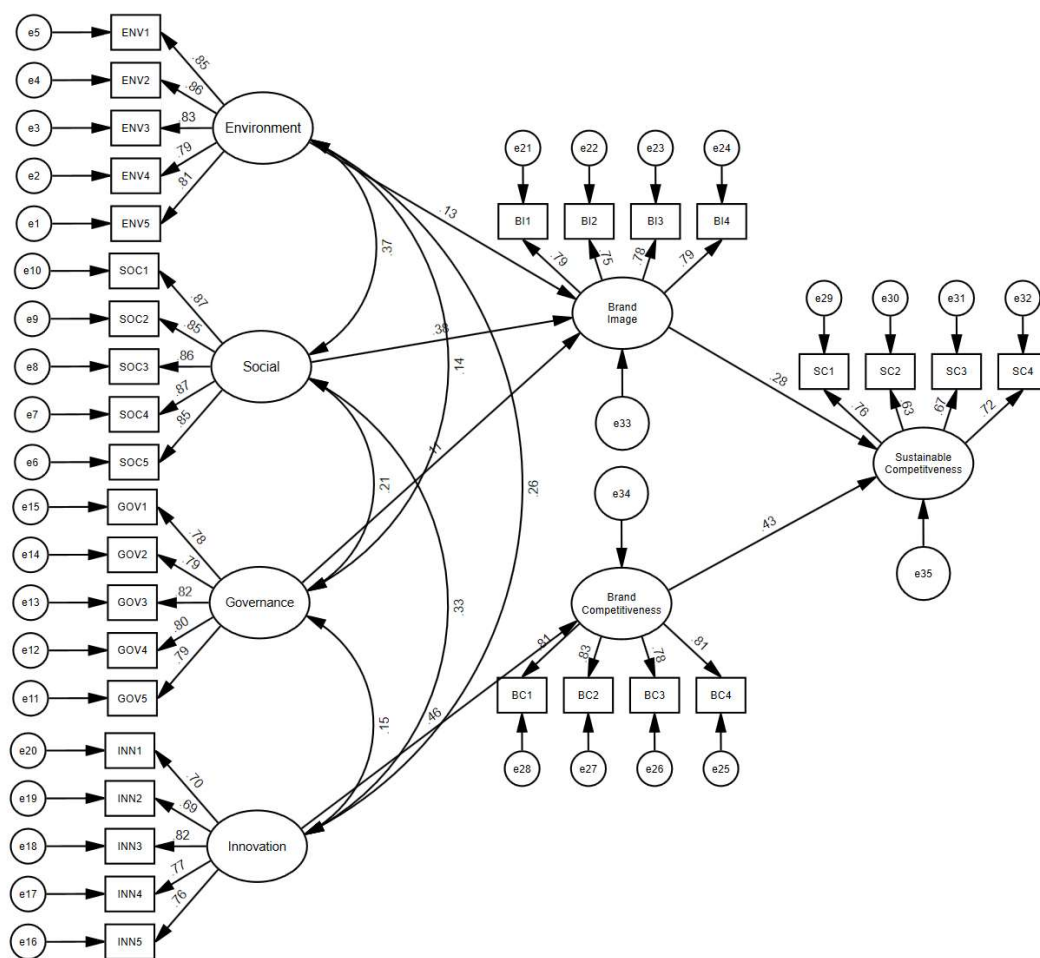


Figure 2. Structural Equation Modeling (SEM)

It can be seen from the structural equation model that:

The Structural Equation Modeling (SEM) results show the relationships between various constructs, including Brand Image, Brand Competitiveness, and Sustainable Competitiveness.

First, the path from Environment to Brand Image has an Estimate of 0.135, with a CR (Critical Ratio) of 2.771 and a p-value of 0.006, indicating a statistically significant positive effect. This suggests that

environmental factors have a moderate but meaningful impact on the brand image of private universities.

The path from Social to Brand Image shows a strong relationship, with an Estimate of 0.375, a CR of 7.365, and a **p-value of *** ($p < 0.001$). This result confirms that social factors have a substantial and highly significant influence on brand image.

Similarly, Governance affects Brand Image with an Estimate of 0.113, a CR of 2.448, and a p-value of 0.014, suggesting a moderate but statistically significant positive relationship between governance factors and brand image.

For Brand Competitiveness, the path from Innovation to Brand Competitiveness has an Estimate of 0.456, with a CR of 9.041 and a **p-value of *** ($p < 0.001$), demonstrating a strong and highly significant effect.

Finally, Brand Image positively impacts Sustainable Competitiveness with an Estimate of 0.277, CR of 5.622, and **p-value of *** ($p < 0.001$), indicating a significant influence. Brand Competitiveness also has a strong impact on Sustainable Competitiveness, with an Estimate of 0.427, CR of 8.382, and **p-value of *** ($p < 0.001$).

Table 5. Structural Equation Modeling Results

			SE	CR	P	Estimate
Brand Image	<---	Environment	0.046	2.771	0.006	0.135
Brand Image	<---	Social	0.044	7.365	***	0.375
Brand Image	<---	Governance	0.046	2.448	0.014	0.113
Brand Competitiveness	<---	Innovation	0.053	9.041	***	0.456
Sustainable Competitiveness	<---	Brand Image	0.044	5.622	***	0.277
Sustainable Competitiveness	<---	Brand Competitiveness	0.044	8.382	***	0.427

6. FINDING AND CONCLUSION

The findings of this study indicate that the proposed conceptual framework is generally supported and that the selected variables play meaningful roles in explaining the sustainable competitiveness of private universities. First, environmental, social, and governance factors were all found to have positive influences on brand image, suggesting that when private universities perform better in sustainability-related practices, social responsibility, and institutional governance, they are more likely to establish a favorable image among stakeholders. Among these dimensions, social factors showed a comparatively stronger role in shaping brand image, which implies that stakeholder-oriented practices, such as social engagement, student support, and public responsibility, are especially important in strengthening institutional perception. In addition, innovation capability was found to positively affect brand competitiveness, showing that universities with stronger innovation awareness and adaptive capacity are more likely to build a competitive and distinctive brand position in the higher education market. The results further revealed that both brand image and brand competitiveness positively contribute to sustainable competitiveness. This means that brand-related factors serve as important channels through which internal development efforts are translated into long-term institutional advantages. Overall, the empirical findings confirm that ESG-related practices and innovation capability are not isolated elements, but rather strategic resources that can enhance the long-term development of private universities through brand building.

Based on the above findings, this study concludes that the sustainable competitiveness of private universities is closely associated with their ability to integrate responsible development, effective governance, and innovation into their institutional strategies. In today's increasingly competitive higher education environment, private universities can no longer rely solely on traditional expansion methods or short-term market responses. Instead, they need to cultivate a stronger institutional image and a more competitive brand by embedding environmental awareness, social commitment, governance quality, and innovation capability into their overall development process. The study also confirms the important mediating role of brand building, which means that the influence of these antecedent factors is not only direct in nature, but is also realized through the enhancement of brand image and brand competitiveness. This highlights that branding in higher education is not merely a communication tool, but a comprehensive reflection of institutional values, strategic management, and developmental capacity. Therefore, if private universities aim to achieve long-term sustainability and stronger market positioning, they should place greater emphasis on responsible governance, social contribution, innovative transformation, and systematic brand management. In this sense, the study not only enriches the understanding of sustainable competitiveness in private higher education, but also provides a practical direction for institutional improvement and strategic planning.

Based on the findings of this study, several recommendations can be proposed for private universities seeking to enhance their sustainable competitiveness. First, private universities should strengthen their environmental, social, and governance practices as part of their long-term development strategy. This means that institutions should not only focus on academic outcomes, but also pay greater attention to environmental responsibility, social engagement, and sound governance in order to build stronger stakeholder trust and institutional legitimacy. Second, universities should invest more actively in innovation capability by promoting digital transformation, curriculum improvement, interdisciplinary collaboration, and more flexible management practices. Innovation should be regarded as a strategic tool for differentiation and long-term growth.

In addition, private universities should attach greater importance to brand development. A strong brand image and competitive brand position can help institutions attract students, improve reputation, and strengthen market influence. Therefore, branding efforts should be integrated with sustainability initiatives and innovation strategies rather than treated as a separate promotional activity. Finally, policymakers and educational administrators are encouraged to provide more support for the sustainable development of private universities through policy guidance, evaluation systems, and resource allocation. Such efforts may create a more favorable environment for private universities to improve quality, strengthen competitiveness, and achieve long-term development.

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