

DIGITAL BRAND BUILDING INDEX (DBBI) CONSTRUCTION OF A SCALE AND VALIDATION IN THE PRIVATE UNIVERSITIES OF TELANGANA

SHANTHI KUMAR S¹, DR. PRASHANT POGUL²

¹Research Scholar, Malla Reddy University, Hyderabad

²Assistant Professor, Malla Reddy University, Hyderabad.

s.kumar@mallareddyuniversity.ac.in¹,
drprashantpogul@mallareddyuniversity.ac.in²

ABSTRACT

This study constructs and confirms a Digital Brand Building Index (DBBI), among private universities in Telangana, India. The digital transformation has since become vital in the marketing of higher education and there is yet to be established a unified tool that can quantify the success of universities in their online brand building efforts. To define online brand-building comprehensively, this paper proposes seven dimensions that include Content Quality, Social Engagement, Electronic Word of Mouth (e WOM), Search Visibility, Website Experience, Paid Media Breadth and Online Reputation. Two large student samples were used to conduct the research on a multi-stage scale development basis. The underlying factor structure was defined using the Exploratory Factor Analysis (EFA) and the construct validity using the Confirmatory Factor Analysis (CFA). Final 24-item DBBI showed good reliability, convergent, and discriminant validity, and gender and program type measurement invariance. Nomological validity was determined by establishing positive correlation among DBBI, university brand equity and institutional reputation. DBBI is a practical benchmarking tool; it has percentile-based bands of managerial decision-making. Future empirical research associating DBBI with student enrollment outcomes has its foundation in this paper.

Keywords: *online brand building, higher education, scale growth, Telangana, factor analysis, brand equity, online reputation.*

INTRODUCTION

The higher education sector has been reshaped by the digital revolution. Prospective students increasingly rely on university websites, social media, online reviews, search engines, fundamentally altering how universities build and maintain their brands (Rutter, Roper, and Lettice, 2016). This shift is especially evident in private universities in India, where competition is intense and differentiation essential.

Branding literature establishes that university brand equity is positively correlated with student choice, satisfaction, institutional reputation (Yoo & Donthu, 2001; Yaping, Xiaobao, & Xing, 2023). Studies of online reputation similarly highlight the influence of online word of mouth, social media interactions on student decision-making (Mateus et al., 2024). However, brand equity and reputation research remain fragmented, with no composite measure of digital brand-building tailored to higher education.

This gap hinders theoretical advancement and leaves private universities without a diagnostic tool to benchmark digital presence or allocate marketing resources systematically. This study proposes and validates the Digital Brand Building Index (DBBI) for private universities in Telangana. The DBBI conceptualizes digital brand-building as a seven-dimensional construct that includes Content Quality, Social Engagement, Electronic Word of Mouth (e-WOM), Search Visibility, Website Experience, Paid Media Breadth, and Online Reputation – and provides a psychometrically validated scale tailored to the Indian higher education context.

The contribution is threefold: (i) operationalizes digital brand-building as a measurable, seven-dimension construct grounded in brand-equality and reputation theory; (ii) offers a validated

24-item instrument for universities, researchers, and policymakers to assess and compare digital brand-building; and (iii) demonstrates nomological links between DBBI and university brand equity and institutional reputation, establishing a basis for future work on enrollment outcomes.

2. LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1 Brand equity in higher education

The importance of awareness, associations, perceived quality, and loyalty is highlighted in brand equity frameworks (Aaker, 1991; Keller, 1993). Customer-based brand equity (CBBE) describes how these factors accumulate in consumer memory to create differential responses to a branded offering. In higher education, CBBE captures students' beliefs about academic quality, employability, campus life, and institutional values beliefs that guide search, application, and enrollment (Yoo & Donthu, 2001). Empirical studies confirm that institutional image significantly influences satisfaction and loyalty (Brown & Mazzarol, 2009) and that university reputation shapes student behavior and retention (Alves & Raposo, 2010). These findings establish that brand equity is both measurable and consequential to student choice, but do not specify which digital activities most effectively build equity.

2.2 Digitalization, online reputation, and e-WOM

With prospective students shifting their decision-making online, digital reputation reviews, ratings, third-party commentary, and institutional responses have become a central proxy for perceived quality and trust. Recent scholarship emphasizes that reputation is shaped less by ranking and more by digitally mediated experiences and responsiveness to student feedback (Mateus et al., 2024). Electronic word of mouth (e-WOM), through student and alumni posts, shares, and discussions, amplifies reputational cues long before formal contact with admissions. Collectively, reputation is co-produced with students online, yet existing measures are rarely integrated into broader digital brand-building frameworks.

2.3 Social Media Presence and Recruitment of Students

Social media plays an important role in brand-building and student recruitment. Evidence from UK universities demonstrates that engagement quality (e.g., comments, community interactions) is positively associated with enrollment outcomes (Rutter, Roper, & Lettice, 2016). For less-established institutions, social media provides a cost-effective mechanism to offset weak legacy reputation through peer endorsements at scale. Findings from emerging economies extend this argument, showing that digital marketing activities directly shape university choice among students in competitive contexts (Saeed & Afsar, 2021). Nonetheless, social media alone is insufficient; without integration with search visibility, website experience, and coherent paid media, its impact is limited.

2.4 Synthesis of previous reviews and the gap

Systematic reviews note fragmented constructs and heterogeneous operationalizations of brand, reputation, and communication strategies in higher education (Yaping, Xiaobao, & Xing, 2023). Much prior work isolates sub-areas such as social media or adapts general brand equity scales without calibration to digital higher education contexts. Reviews of branding research also emphasize the need for unified constructs to guide both academic progress and managerial benchmarking (Chapleo, 2015; Hemsley-Brown & Oplatka, 2016). Consequently, institutions lack a comprehensive diagnostic instrument for digital presence, and researchers lack a validated tool for comparative analysis across regions. This motivates development of a Digital Brand-Building Index (DBBI), for private universities.

2.5 Construct Definition and Dimensionalization of DBBI

Drawing from prior literature and practice, digital brand-building is defined as a university's capability to integrate and manage owned, earned, and paid digital touchpoints to shape favorable student perceptions and increase enrollment. Based on this conceptualization, the DBBI comprises seven interrelated dimensions:

1. Content Quality (CQ): relevance, clarity, authenticity, and outcome evidence (e.g., placements, alumni stories) (Keller, 1993).
2. Social Engagement (SE): two-way interactions through comments, Q&A, and livestreams that signal accessibility and responsiveness (Rutter et al, 2016).
3. Electronic Word of Mouth (e-WOM, EW): peer-to-peer amplification or correction of narratives via posts, shares, and forums (Mateus et al, 2024).
4. Search Visibility (SV): discoverability through branded and category queries, ensuring entry into early student consideration.
5. Website Experience (WX): navigation, mobile performance, and architecture that minimize friction from interest to application (Yoo & Donthu, 2001).
6. Paid Media Breadth (PM): professional, consistent messaging across platforms that complements organic reach.

These dimensions are distinct yet interconnected, aligning with the Customer-Based Brand Equity (CBBE) pathway (Keller, 1993; Yoo & Donthu, 2001) and grounded in observable digital touchpoints central to contemporary higher education branding (Rutter et al., 2016).

2.6 Nomological network and validation logic

A valid construct must operate predictably within a broader theoretical network. DBBI is positioned as an antecedent to University Brand Equity (UBE) where stronger digital brand-building should elevate awareness, perceived quality, and loyalty (Keller, 1993; Yoo & Donthu, 2001) and Institutional Reputation (IR), where effective orchestration of content, engagement, and responsiveness enhances trust (Mateus et al., 2024).

This study therefore proposes validation criteria rather than casual hypotheses:

- P1 (Convergent/Discriminant): DBBI forms a discriminant but correlated multifactor structure, with AVE $\geq .50$, Fornell Larcker, HTMT criteria satisfied.
- P2 (Nomological): DBBI is positively associated with UBE and IR, validating its position in the brand-reputation network.
- P3 (Invariance): DBBI demonstrates measurement invariance across key groups (e.g., gender, level of program), supporting generalizability.

These propositions translate theory into testable validation standards and provide a foundation for future longitudinal research linking DBBI scores to enrollment outcomes.

3. METHODOLOGY

This study employed a multi-stage scale development design, widely used in psychometric research (Churchill, 1979; Hinkin, 1998). The approach combined inductive exploration to identify latent dimensions with deductive confirmation to test model stability across samples. The context of private universities in Telangana was selected for cultural and managerial relevance, as students increasingly rely on digital touchpoints when choosing universities.

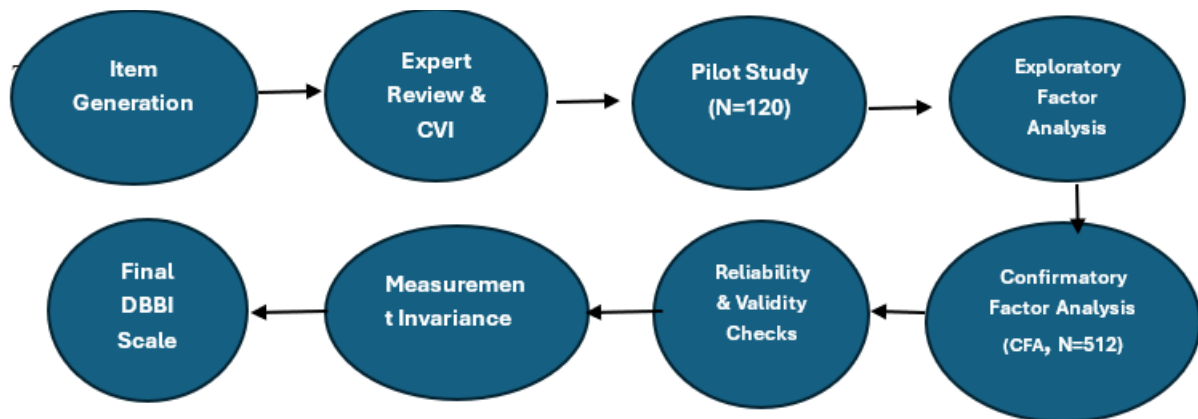


Fig 1: Architecture

Item generation drew on three inputs: (i) prior scholarly literature on consumer-based brand sniequity and digital reputation (Yoo& Donthu, 2001; Rutter, Lettice, & Nadeem, 2016; Mateus et al., 2024); (ii) industry practice reports such as SEO audits and higher education marketing benchmarks; and (iii) contextual adaptation, items reworded for clarity. An initial pool of 52 items was reviewed by a panel of five experts (two senior university marketing directors, one digital marketing professional, and two academic branding scholars) for relevance and fit. Using the Content Validity Index (CVI) (Polit & Beck, 2006), items with CVI < .80 were eliminated, yielding 38 items.

A pilot study with 120 students assessed clarity and preliminary psychometric properties. Items with low variance ($SD < 0.80$) or low reliability (Cronbach's $\alpha < .70$) were dropped, reducing the scale to 32 items across seven hypothesized dimensions. A full-scale Exploratory Factor Analysis (EFA) was then conducted with 480 students. Sampling adequacy was excellent ($KMO = .897$), and Bartlett's test of sphericity was significant ($\chi^2(378) = 8,109.49, p < .001$). Principal Axis Factoring (PAF) was used with oblimin rotation. Factor retention was guided by parallel analysis (Hayton, Allen, & Scarpello, 2004). Items with loadings < .50, cross-loadings > .30, or communalities < .40 were removed. The final solution yielded seven factors explaining 70.0% of total variance, with loadings between .75-.85 and communalities .61-.80, resulting in a 24-item DBBI.

Confirmatory Factor Analysis (CFA) was conducted on an independent sample of 512 students. The hypothesized seven-factor structure demonstrated excellent fit and outperformed single and three factor alternatives (Hair et al., 2010): $\chi^2/df = 2.41$, CFI = .956, TLI = .949, RMSEA = .053, and SRMR = .046. Reliability and convergent validity were confirmed (Cronbach's $\alpha \geq .828$, CR $\geq .853$, and AVE $\geq .593$). Discriminant validity was supported since $\sqrt{AVE}$ values exceeded inter-construct correlations (Fornell & Larcker, 1981), and HTMT ratios ranged from .272 to .412, below the .85 threshold (Henseler, Ringle, & Sarstedt, 2015). The CR and AVE were computed using standard SEM equations as below to confirm internal consistency and convergent validity.

$$CR = \frac{(\sum \lambda_i)^2}{\sum \lambda_i^2 + \sum \theta_i} \quad AVE = \frac{\sum \lambda_i^2}{\sum \lambda_i^2 + \sum \theta_i}$$

Finally, measurement invariance was tested via multi-group CFA across gender and program level. Configural, metric, and scalar invariance were supported with ($\Delta CFI \leq .010$; $\Delta RMSEA \leq .015$) (Cheung & Rensvold, 2002), confirming the DBBI's generalizability. Ethical protocols

were followed: Institutional Review Board approval was obtained, informed consent secured, and anonymity.

4. RESULTS

The dataset was first tested for suitability in factor analysis. Bartlett's test of sphericity was significant ($\chi^2(378) = 8,109.49, p < .001$), and the Kaiser-Meyer-Olkin (KMO) measure of .897 confirmed sampling adequacy.

The Exploratory Factor Analysis (EFA) using principal axis factoring with oblimin rotation produced a stable seven factor solution that explained 70.0% of the variance. Factor loadings (.75 to .85), low cross-loadings were below (<.30), and communalities (.61-.80) supported the dimensionality of the Digital Brand-Building Index (DBBI). Fig 1 presents the screen plot with parallel analysis confirming retention of seven factors.

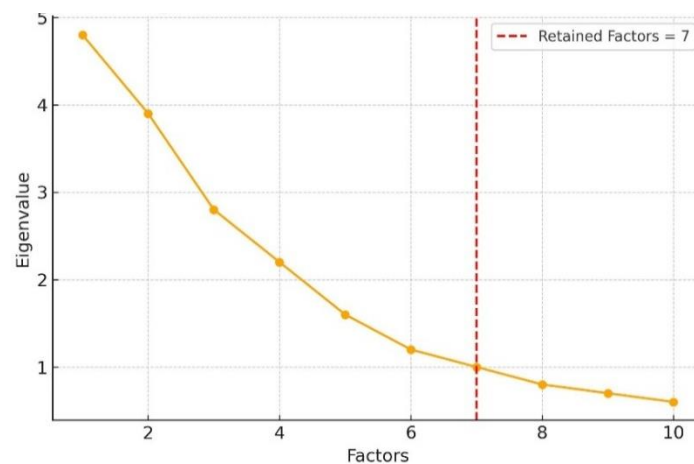


Fig 2: Screen plot for Factor Retention

Confirmatory Factor Analysis (CFA) on an independent sample (N=512) demonstrated excellent fit ($\chi^2/df = 2.41$, CFI = .956, TLI = .949, RMSEA = .053, SRMR = .046). Reliability and convergent were strong, with statistics in Table 1.

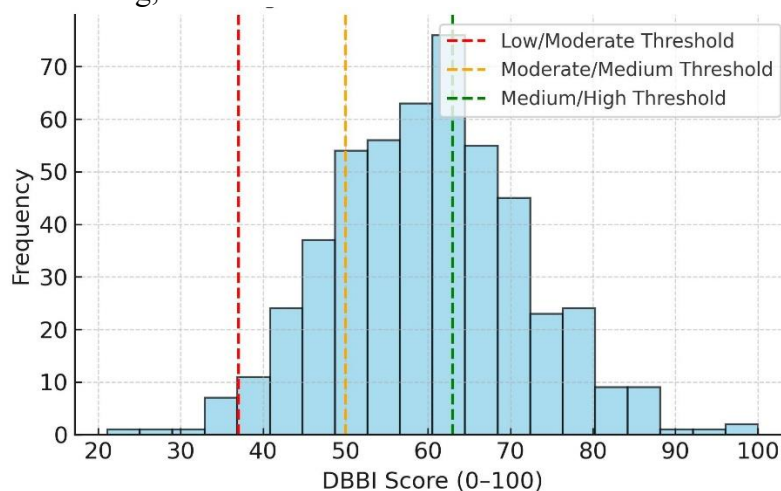


Fig 3: DBBI Score Distribution

Table 1 Reliability and Convergent Validity (CFA, N = 512)

Construct	Items	Cronbach's α	CR	AVE
CQ	4	.83	.86	.60
SE	4	.85	.87	.62
EW	4	.86	.87	.62
SV	4	.86	.88	.63
WX	4	.84	.86	.61
PM	4	.83	.85	.59
OR	4	.89	.91	.70

Nomological validity was established through positive correlations with University Brand Equity ($\beta = .64$, $R^2 = .42$) and Institutional Reputation ($\beta = .49$, $R^2 = .24$). Measurement invariance tests ($\Delta CFI \leq .010$; $\Delta RMSEA \leq .015$) confirmed stability across gender and program level, supporting generalizability. Together, these findings validate DBBI as a reliable and psychometrically sound scale that is applicable in both academic research and managerial decision-making.

5. DISCUSSION

This study positions the Digital Brand-Building Index (DBBI), a timely contribution to higher education branding. Unlike earlier frameworks that emphasized generic brand equity elements such as awareness, associations, and loyalty (Aaker, 1991; Keller, 1993; Yoo and Donthu, 2001), DBBI incorporates digitally specific dimensions that reflect how students today evaluate institutions. The strong factor structure and validity tests demonstrate that digital touchpoints content, engagement, peer communication, and reputation management are not peripheral, but core drivers of student choice.

The results also echo and extend prior work. For instance, the positive association between DBBI and both University Brand Equity and Institutional Reputation aligns with earlier findings on the role of online reputation in shaping trust (Mateus et al., 2024), but provides a more systematic and scalable measure. By integrating these facets into a unified diagnostic tool, DBBI bridges fragmented approaches noted in past reviews (Yaping, Xiaobao & Xing, 2023). For practitioners, this implies that digital strategy must be managed holistically, rather than as isolated social media or website efforts. For researchers, DBBI offers a robust platform to test new hypotheses, such as the moderating effect of culture or institutional type on digital brand-building outcomes.

6. LIMITATIONS AND FUTURE RESEARCH

Although this study offers a validated scale of digital brand building, it has certain limitations. First, empirical testing was based on a cross-section dataset of Telangana private universities; while sufficient for scale validation, findings may not generalize to public institutions or other state and national contexts. Second, the data were derived from student perceptions and not behavioral outcomes; the predictive relationship between DBBI and actual enrollment decisions is yet to be tested.

Future research should adopt longitudinal and multi-context designs. Linking DBBI scores with actual admissions data across cycles would establish predictive validity and provide managers with return-on-investment evidence for digital campaigns. Comparative studies

across states or countries could test cross-cultural generalizability, while mixed methods – such as incorporating student qualitative feedback may refine item wording and capture emerging online behaviors. These extensions would strengthen DBBI as both an academic construct and a practical benchmarking tool.

7. CONCLUSION

This study introduced and validated the Digital Brand Building Index (DBBI), a seven dimensional instrument that quantifies how private universities orchestrate digital channels to influence student perceptions. By moving beyond traditional brand equity scales, the DBBI establishes digital building as both a measurable construct and a practical benchmarking tool. The study's implications are twofold. For university leaders, DBBI provides a structured approach to evaluate digital performance, direct resources to high-impact touchpoints, and build trust among students navigating increasingly competitive options. For policymakers, it offers a transparent framework to complement quality assurance processes and ensure equitable access to credible information, particularly for first-generation learners. Looking ahead, future research should extend validation across different cultural and institutional contexts and investigate the predictive power of DBBI for actual enrolment outcomes. In doing so, the index has the potential not only to advance academic theory but also to inform managerial and policy decisions that shape the future of higher education.

REFERENCES

1. Aaker, D. A. (1991). *Managing brand equity: Capitalizing on the value of a brand name*. Free Press.
2. Alves, H. & Raposo, M. (2010). The influence of university image on student behavior. *International Journal of Educational Management*, 24(1), 73-85. <https://doi.org/10.1108/09513541011013060>
3. Brown, R. M., & Mazzarol, T. W. (2009). The importance of institutional image to student satisfaction and loyalty. *Higher Education*, 58(1), 81-95. <https://doi.org/10.1007/s10734-008-9183-8>
4. Chapleo, C. (2015). Brands in higher education: A review and future research directions. *International Studies of Management & Organization*, 45(2), 150-163. <https://doi.org/10.1080/00208825.2015.1006019>
5. Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, 9(2), 233–255. https://doi.org/10.1207/S15328007SEM0902_5
6. Churchill, G. A. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research*, 16(1), 64–73. <https://doi.org/10.1177/002224377901600110>
7. Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. <https://doi.org/10.1177/002224378101800104>
8. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Pearson.
9. Hayton, J. C., Allen, D. G., & Scarpello, V. (2004). Factor retention decisions in exploratory factor analysis: A tutorial on parallel analysis. *Organizational Research Methods*, 7(2), 191–205. <https://doi.org/10.1177/1094428104263675>
10. Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the*

Academy of Marketing Science, 43(1), 115–135. <https://doi.org/10.1007/s11747-014-0403-8>

11. Hemsley-Brown, J., & Oplatka, I. (2016). University choice: What do we know, what don't we know, and what do we still need to find out? *International Journal of Educational Management*, 30(6), 556-571. <https://doi.org/10.1108/IJEM-10-2015-0140>
12. Hinkin, T. R. (1998). A brief tutorial on the development of measures for use in survey questionnaires. *Organizational Research Methods*, 1(1), 104-121. <https://doi.org/10.1177/109442819800100106>
13. Keller, K. L. (1993). Conceptualizing, measuring, and managing customer-based brand equity. *Journal of Marketing*, 57(1), 1–22. <https://doi.org/10.1177/002224299305700101>
14. MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong, S. (1999). Sample size in factor analysis. *Psychological Methods*, 4(1), 84–99. <https://doi.org/10.1037/1082-989X.4.1.84>
15. Mateus, I., Brites, R., & Gonçalves, G. (2024). The impact of online reputation on students' trust in higher education institutions. *Journal of Marketing for Higher Education*, 34(1), 75–94. <https://doi.org/10.1080/08841241.2023.2215671>
16. Polit, D. F., & Beck, C. T. (2006). The content validity index: Are you sure you know what's being reported? Critique and recommendations. *Research in Nursing & Health*, 29(5), 489-497. <https://doi.org/10.1002/nur.20147>
17. Rutter, R., Lettice, F., & Nadeem, M. (2016). Branding higher education: An exploration of the role of social media. *Journal of Business Research*, 69(8), 3096–3104. <https://doi.org/10.1016/j.jbusres.2016.01.020>
18. Saeed, S., & Afsar, B. (2021). Impact of digital marketing on student's university choice in emerging economies. *Journal of Marketing for Higher Education*, 31(2), 251-271. <https://doi.org/10.1080/08841241.2020.1768611>
19. Yoo, B., & Donthu, N. (2001). Developing and validating a multidimensional consumer-based brand equity scale. *Journal of Business Research*, 52(1), 1–14. [https://doi.org/10.1016/S0148-2963\(99\)00098-3](https://doi.org/10.1016/S0148-2963(99)00098-3)
20. Yaping, Z., Xiaobao, P., & Xing, Y. (2023). Digital marketing capabilities and brand equity in higher education institutions. *Asia Pacific Journal of Marketing and Logistics*, 35(2), 456–474. <https://doi.org/10.1108/APJML-09-2021-0651>.