THE INFLUENCE OF DIGITAL USER EXPERIENCE ON BRAND PERCEPTION AND CUSTOMER LOYALTY IN ONLINE RETAIL

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ABSTRACT: *This study explores how digital user experience (DUE) affects brand perception (BP) and customer loyalty (CL) among undergraduate students who frequently shop online. Using a quantitative approach, the research gathered data from college students enrolled in business and management programs through a structured questionnaire focusing on DUE, BP, and CL. The relationships among these factors were analyzed using Structural Equation Modeling (SEM) with Partial Least Squares (PLS). Findings reveal that a positive digital user experience plays a key role in shaping how students perceive a brand, which in turn has a strong impact on their loyalty as customers. Students generally reported good experiences with online shopping platforms, especially valuing features such as ease of use, strong security, and the ability to track orders in real time. However, many pointed out that resolving technical issues quickly is still an area that needs improvement. Brand perception was also rated highly, with innovation and customer engagement standing out as strengths. The results highlight the importance of well-designed, user-friendly, and personalized digital interfaces in building strong brand relationships and maintaining customer loyalty, particularly among young, tech-savvy consumers. For online retailers and digital service providers, this study emphasizes the value of putting users at the center of design and offering responsive support to build trust and retain customers in today's fast-paced e-commerce world.*

Keywords: digital user experience, brand perception, customer loyalty, online retail, university students, e-commerce, digital technologies

1. INTRODUCTION

The rapid growth of digital technologies has transformed the landscape of modern commerce, particularly in the online retail sector. In today's highly competitive e-commerce industry where everyone has countless options at their fingertips, digital user experience (DUE) has developed as a critical differentiator for online businesses. Consumers engaged with brands through multifaceted digital experiences that significantly influence their perceptions, behaviors, and loyalty with the increasing integration of digital platforms into everyday life. Digital user experience (DUE) has become a critical determinant in shaping how consumers interact with online retail environments. Effective digital user experience is achieved through attracting, engaging, and retaining customers. Offering seamless, intuitive, and personalized digital interfaces is crucial for sustaining consumer engagement and nurturing brand loyalty. On the other hand, a poorly designed digital user experience may damage brand reputation which leads to negative perceptions and brand avoidance.

Brand image as perceived in the minds of consumers is deeply influenced by their direct interactions with a company's digital platform. The website or app serves as the brand in the digital sphere especially for online sector where physical interaction as not available. Customer loyalty happens when a customer repeatedly chose a particular brand over other brands. It is important in sustaining growth in e-commerce. Retention of existing customers is less expensive than bringing in new customers.

Understanding the complex relationship among digital user experience, brand perception, and customer loyalty has become critical for both academic researchers and industry practitioners. Digital user experience encompasses the totality of users' interactions with digital interfaces, usability, responsiveness, personalization, security, and aesthetic appeal.

A well-crafted digital experience boosts customer satisfaction while strengthening brand trust and fostering a deeper emotional connection. In consideration, these factors contribute to a more positive brand perception which has been shown to directly influence customer loyalty behaviors such as repeat purchases, advocacy, and resistance to switching brands.

Previous studies highlight that digital user experience significantly affects how consumers evaluate a brand's reliability, professionalism, and innovativeness (Kumar, 2023; Susilawati et al., 2024) [1]. Further, research suggests that brand perception plays a mediating role in the relationship between user experience and customer loyalty (Guliyev, 2023; Kusumawati et al., 2023) [2]. However, empirical studies that validate these relationships, particularly in the context of younger, digitally native consumer segments such as university students remain limited.

This study seeks to address this gap by examining how digital user experience influences brand perception and subsequently customer loyalty among students engaged in online shopping. In addition, this study evaluates the strength and direction of these relationships based on data gathered from a large sample of undergraduate students. Findings from this research provide valuable insights for marketers, digital platform developers, and brand managers aiming to optimize online customer engagement and build long-term brand loyalty.

2. MATERIALS AND METHODS

This research investigates the influence of digital user experience (DUE) on brand perception (BP) and customer loyalty (CL) among undergraduate students engaged in online shopping. Employing a quantitative research design,

data were collected from students across business and management programs using a structured questionnaire measuring DUE, BP, and CL.

This study used a quantitative research design, incorporating both descriptive and inferential statistical techniques to investigate the influence of Digital User Experience (DUE) on Brand Perception (BP) and Customer Loyalty (CL) in the context of online retail. Structural Equation Modeling (SEM) with Partial Least Squares (PLS) was utilized to examine the complex interrelationships among the latent constructs, enabling simultaneous evaluation of both the measurement and structural components of the model.

The sample comprised of undergraduate students enrolled in academic programs of business and management. A purposive sampling technique was adopted targeting individuals with prior experience using online shopping platforms.

A pre-test was conducted to at least 30 students who were not part of the actual study's target population to ensure the reliability of the questionnaire to evaluate the internal consistency of the instrument using Cronbach's Alpha. Analysis revealed that the section on digital user experience which consisted of 20 items has achieved a reliability score of 0.898 indicating good reliability. Both the view on the brand and loyalty to the brand sections which also have 20 items each yielded Cronbach's Alpha values of 0.935 and 0.946 respectively with an interpretation of excellent reliability. The overall 60-item questionnaire showed a Cronbach's Alpha of 0.968 which has verbal interpretation of excellent internal consistency. These results confirm that the instrument is highly reliable for measuring the constructs included in the study.

Primary data were collected using a structured questionnaire consisting of three sections, each corresponding to one of the study's latent variables. Digital User Experience (DUE) was measured using a 20-item scale encompassing dimensions such as usability, security, personalization, responsiveness, and aesthetic quality. Sample items included assessments of navigation ease, real-time order tracking, and customer support availability. Brand Perception (BP) was evaluated through a separate 20-item scale focusing on dimensions such as trust, reliability, innovation, customer engagement, and online presence. Customer Loyalty (CL) was measured using another 20-item scale that examined behavioral and attitudinal loyalty indicators, including repeat purchase behavior, emotional attachment, advocacy, and tolerance for price variations.

Data were gathered through an online survey disseminated via institutional learning management systems and official academic group platforms. Participation was voluntary, and all respondents were briefed on the purpose of the study. Anonymity and confidentiality were ensured, and ethical guidelines were strictly followed in accordance with institutional protocols.

Data analysis was conducted in two phases. The first phase involved the use of descriptive statistics to summarize the demographic characteristics and item responses, providing an overview of trends in perceptions related to DUE, BP, and CL. The second phase employed Structural Equation Modeling (SEM) with Partial Least Squares (PLS) to validate the measurement model and test the hypothesized structural relationships. Model fit was evaluated using indices such as the Standardized Root Mean Square Residual (SRMR), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Normed Fit Index (NFI). Discriminant validity was assessed using the Heterotrait-Monotrait Ratio of Correlations (HTMT). Finally, path analysis was conducted to determine the strength and significance of the hypothesized relationships among DUE, BP, and CL.

3. RESULTS AND DISCUSSION

Frequency Distribution of the Demographic Profile of the Students. The descriptive statistics for the variables of interest, presenting insights into the characteristics of respondents participating in the study, including digital user age, course, year level, and sex shows the frequency counts and percentages provide an overview of the respondents' perceptions and behaviors related to these constructions.

Most of the students' ages ranged from 18 to 24 years old, suggesting a majority of the digital students with a reasonable variability indicated by a percentage of 92.36%. This is consistent with the typical age range of undergraduate students. However, there are five users aged 35 to 44 with 0.41%. The age distribution reflects a predominantly young and digitally acquainted group accustomed to online environment and digital consumer platforms.

Data concerning the students' academic programs, BS Hospitality Management rated the highest on the survey, 38.46%. Results suggest that the study sample is more heavily weighted toward hospitality and tourism programs potentially influencing their consumer behavior and preferences, especially in service-oriented online retail experiences.

The study also included descriptive statistics of students' year level and based on the results, most students came from the first year and second year level, with 33.61% and 32.54%, respectively. This implies that younger students are more engaged in digital experiences due to greater flexibility and openness to new technologies. These data deviate with 75.51% female and only 24.49% male. The difference reflect enrollment trends within the programs surveyed or potentially greater willingness among female students to participate in studies related to consumer behavior and digital user experience.

Table 1. Relationship between digital user experience, brand perception and consumer loyalty in online shopping

Variable	Pearson's *r*	*p*-value	Remark
Digital user experience and Brand perception	0.842	0.000	**Significant**
Digital user experience and Customer Loyalty	0.785	0.000	**Significant**
Brand perception and Customer Loyalty	0.862	0.000	**Significant**

**Tested at 0.05 level of significance using Pearson's correlation*

Relationship between digital user experience, brand perception and consumer loyalty in online shopping. Table 1 depicts the complex association among digital user experience, brand image, and customer loyalty during online shopping. The study was conducted at a significance level of 0.05 via Pearson's r correlation, which provides key insights into variables determining student consumer loyalty towards online shopping. Significantly, it was revealed that the three variables examined possess a considerable association, as is clear from the p-value of 0.000. Results underscore the critical role of digital user experience in shaping brand perception which significantly influences customer loyalty. The high correlation between brand perception and customer loyalty r = 0.862 suggests how a brand is viewed online through factors such as credibility, aesthetic, interactivity, and responsiveness has a direct impact on consumers' decisions to remain loyal. This result highlights the significance of considering digital user experience and brand perception in customer loyalty situations and their possible effects on online shopping.

These findings support Nalindah's (2022) study that, in the age of digital technology, internet sites, particularly social media, have a critical role in influencing brand image through consumer feedback and recommendations [3]. In addition, customer loyalty affects customer satisfaction with the brand. In online retail, fostering loyalty involves leveraging digital technologies and data-driven insights to personalize user experiences, build confidence, and nurture long-term customer relationships across various touchpoints in the purchase journey (Ayuna & Prabowo, 2023).

By enhancing the digital user experience through intuitive interfaces, personalized recommendations, responsive service, and engaging design, brands may strengthen customers' perception and in turn foster deeper customer loyalty. This is evident among digitally younger consumers such as those in age group 18 to 24 which is dominant in the study. These insights carry practical implications for marketers and online retailers.

Digital user experience in online retail platforms. Results reflect how respondents evaluate various aspects of their interaction with digital shopping environments. Overall, findings indicate a generally positive user experience as evidenced by the average mean score of 3.69. Respondents are largely satisfied with the usability, functionality and accessibility of the digital platforms they are engaged.

The results of the 20-item statements about digital user experience revealed the respondents' ventures in online retail. Eighteen out of the twenty items were rated with a mean above 3.50 indicating consistent agreement among respondents. The highest rated item, "I can track my orders and get real-time updates", indicating tracking orders and getting real-time updates with a mean of 3.90 as the highest, highlights the importance of transparency and timely communication in enhancing consumer trust and satisfaction. In contrast, two items received a neutral response, both with means below 3.50. Technical issues experienced by the user get resolved quickly with a mean of 3.42 as the lowest mean point to areas of improvement particularly in technical performance and issue resolution which significantly impact user satisfaction if not addressed promptly.

Several statements reflecting social influence and behavioral intent like, "Everyone is saving time and money by shopping online, and I should do the same" and "Millions of shoppers worldwide trust this platform" were rated agree. This suggests that social proof and peer behavior play a role in shaping students' attitudes toward online shopping.

The pattern of responses proposes that students generally perceive their online shopping experiences as smooth, personalized, and user-friendly with notable appreciation for security, accessibility, and interactive elements. These findings are in line with Kumar (2023) who emphasized that a comprehensive digital user experience integrates usability, functionality, aesthetics, and emotional engagement [5]. Few technical concerns were rated neutrally indicates that while overall satisfaction is high, platform developers and retailers should focus on enhancing technical performance and issue resolution mechanisms to further strengthen digital user engagement.

Brand perception. As to brand perception, the overall mean score of 3.68 reinforces this observation, reflecting a strong and favorable perception of the brand across multiple dimensions. This indicates that the overall sentiment toward the brand is positive. It can be observed that a 20-item statement signifies agreement on the respondents' end with a mean range from 3.00 to 4.00. Respondents hold a generally favorable view of the brand across a wide range of attributes, including trust, quality, innovation, customer engagement, and digital presence. Respondents perceive that the brand actively engages with its customers online and is innovative and modern, with a 3.76 mean, which is the highest. These findings suggest that respondents particularly appreciate the brand's responsiveness and relevance in the digital space, key components in today's competitive online environment. It underscores the brand's perceived technological relevance and interactive engagement strategy, which are critical drivers of positive brand perception in the current digital-first consumer environment. Customers clearly value not only the functionality of the brand's offerings but also its ability to remain current, responsive, and forward-thinking.

The lowest-rated item, "Everyone is talking about how this brand has revolutionized their online shopping experience – I should not be left out" with a mean of 3.58, while still within the "agree" range reflects a slightly lower degree of social influence-based motivation. This suggests that while most consumers perceive the brand positively based on personal experience, they may not fully resonate with external hype or herd behavior. This subtle distinction may imply that brand affinity is driven more by authentic individual experience than by trends or collective momentum.

Supporting this interpretation, Kusumawati (2023) emphasized that brand perception is significantly influenced by brand awareness, image, personality, and brand associations, all of which are shaped through consistent messaging, high product quality, and interactive customer experiences [6]. In parallel, Guliyev (2023) found that positive brand perception directly impacts consumer purchasing behavior, asserting that once consumers form

favorable impressions, brand loyalty and emotional connection naturally follow, reinforcing the brand's image and market position [2].

In conclusion, the consistently positive ratings across all brand perception indicators highlight the brand's effectiveness in establishing a strong emotional and cognitive connection with its customers, ultimately enhancing consumer confidence, trust, and advocacy.

Customer loyalty. The overall mean of 3.61 which signifies that the respondents agree on 20-item statements, indicating a generally positive sentiment among respondents regarding their loyalty to the brand. This finding reflects a strong foundation of loyalty behaviors and attitudes, albeit with some room for deeper engagement and emotional connection. The highest-rated item is "I am satisfied with my overall experience" with a mean of 3.72, highlighting that satisfaction remains a central pillar of loyalty. This aligns with previous research by Rahayu and Harsono (2023), who emphasized that customer satisfaction directly correlates with repeat purchasing behavior and sustained brand relationships [7]. A positive overall experience serves as the primary catalyst for continued customer engagement and brand trust.

In contrast, the lowest-rated item is "I shop from them regularly" with a mean of 3.44, which falls just within the "neutral" category. This suggests that although customers express general agreement with loyalty-related statements, they may not consistently engage in habitual purchases. This could be influenced by factors such as product category, price sensitivity, or availability of alternatives.

Several other items also hover near the Neutral-Agree threshold, such as "I am willing to pay a bit more for their products" (mean = 3.49) and "Even if I had a small issue about the brand, I would still buy from them again" (mean = 3.47). These indicate conditional loyalty. While customers are generally satisfied and inclined toward continued patronage, their loyalty may be price-sensitive or vulnerable to minor negative experiences.

It can be noted that affective and community-based loyalty indicators such as "I feel a connection with this brand" with a mean of 3.55 and "I feel bound to join the growing community of loyal customers who love it" with a mean of 3.63 show that emotional and social motivations also contribute meaningfully to customer retention. These items point to the growing importance of community affiliation and shared experiences in strengthening brand-consumer relationships.

Furthermore, indicators related to brand advocacy and social proof like "I have recommended this brand to friends or family" with a mean of 3.69 and "I believe that millions of repeat customers cannot be wrong" with a mean of 3.62 highlight the influential role of peer perception and word-of-mouth in reinforcing loyalty. These suggest that customers not only engage with the brand personally but are also influenced by the collective behavior and trust of other users.

The consistency across items with means mostly above 3.50 underscores a multi-dimensional loyalty encompassing behavioral actions like repeat purchases, reviews, emotional connection, advocacy, and perceived community belonging. As Rahayu and Harsono (2023) affirm, true loyalty is a blend of behavioral repetition and emotional investment, and the data here substantiates that blend [7].

In summary, the data reveals a solid yet not unshakeable level of customer loyalty. While satisfaction and intent to stay are evident, areas such as regular purchasing frequency and price sensitivity may need strategic improvement. To enhance loyalty further, the brand could focus on personalization, loyalty incentives, community-building, and consistently exceptional customer service—factors that strengthen both rational and emotional bonds with customers.

Assessment of model fit. Model fit assessment measures the goodness-of-fit of the structural equation model (SEM) with partial least squares (PLS) to observed data. It assists in checking how well the hypothesized model fits the data and if relationships between latent variables are statistically significant.

Table 2. Fit indices of the model

X^2	*p*-value	SRMR	NFI	CFI	TLI
7709	0.000	0.026	0.999	0.999	0.998

In particular, the model chi-square statistic, with a value of x^2=7709, suggests an extreme deviation from what would be expected under the null hypothesis. However, the p-value of 0.000 indicates a highly significant deviation. These data indicate a poor model fit, but before concluding that the model is a bad fit, the study considers the SRMR, NFI, CFI, and TLI.

Standardized Root Mean Square Residual (SRMR) indicates the goodness of fit of a model to the data in structural equation modeling (SEM) with partial least squares (PLS). In this study, the SRMR result showed that 0.026 is an acceptable fit model. This information indicates that the model's predicted values correspond well with the observed data. However, slight residual differences indicate minimal error, but the model is likely valid and reliable.

Table 3. Loadings distribution of digital user experience, brand perception, and customer loyalty

Digital User Experience		Brand Perception		Customer Loyalty	
Items	Loadings	Items	Loadings	Items	Loadings
DUE1	0.840	BP1	0.847	CL1	0.818
DUE2	0.791	BP2	0.872	CL2	0.860
DUE3	0.841	BP3	0.878	CL3	0.863
DUE4	0.857	BP4	0.850	CL4	0.861
DUE5	0.811	BP5	0.891	CL5	0.856
DUE6	0.853	BP6	0.892	CL6	0.796
DUE7	0.827	BP7	0.894	CL7	0.869
DUE8	0.862	BP8	0.876	CL8	0.897
DUE9	0.869	BP9	0.887	CL9	0.838
DUE10	0.865	BP10	0.891	CL10	0.866
DUE11	0.848	BP11	0.897	CL11	0.895
DUE12	0.857	BP12	0.884	CL12	0.863
DUE13	0.869	BP13	0.893	CL13	0.908
DUE14	0.802	BP14	0.903	CL14	0.900
DUE15	0.849	BP15	0.863	CL15	0.819
DUE16	0.855	BP16	0.878	CL16	0.897

DUE17	0.821	BP17	0.872	CL17	0.881
DUE18	0.847	BP18	0.899	CL18	0.897
DUE19	0.816	BP19	0.893	CL19	0.894
DUE20	0.882	BP20	0.904	CL20	0.893

In addition, NFI (0.999) indicates a very high fit, CFI (0.999) is considered ideal, and TLI (0.998) signals a great fit. Overall, the investigation appears very well-constructed and well-fitting. The extremely high values suggest it explains the data well with minimal error. Since the SRMR is also low (0.026), everything aligns with a strong model fit. Consequently, the study also explores the significant influence of digital user experience on brand perception and consumer loyalty.

Table 3 discusses the indicators' factor loadings (FL) within each latent variable. The digital user experience construct is denoted as DUE, brand perception is BP, and customer loyalty is CL. Factor loadings for DUE indicators, ranging from 0.791 to 0.882, indicate a strong association between the indicators and the underlying factor.

In the meantime, factor loading for BP varied from 0.847 to 0.904, indicating a high relationship and that the indicators are good representations of the latent construct. Factor loading for CL varies from 0.796 to 0.908, highlighting high relationships. While factor loading shows how strongly each observed variable is associated with a latent factor, the study must analyze the Cronbach's alpha, composite reliability, and Average Variance Extracted (AVE) of digital user experience, brand perception, and customer loyalty.

Table 4 presents the assessment of internal consistency reliability and convergent validity of the three constructs: Digital User Experience (DUE), Brand Perception (BP), and Customer Loyalty (CL), based on Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE).

Table 4. Cronbach's alpha, composite reliability, and average variance extracted (AVE) of digital user experience, brand perception, and customer loyalty

Construct	Cronbach's alpha	Composite reliability (CR)	Average variance extracted (AVE)
Digital User Experience	0.979	0.980	0.711
Brand Perception	0.985	0.986	0.780
Customer Loyalty	0.983	0.984	0.755

Note: CR > 0.70 (Byrne (2016))

In like manner, BP has high internal consistency reliability (Cronbach's Alpha = 0.985) and CR (0.986), alongside an AVE value of 0.780, indicating satisfactory convergent validity. Similarly, CL exhibit's reliability (Cronbach's Alpha = 0.983) and CR (0.984), with an AVE of 0.755, confirming convergent validity.

Collectively, these findings confirm that all three constructs in the measurement model possess strong reliability and meet the requirements for convergent validity for all constructs. To further assess discriminant validity, the Heterotrait-Monotrait Ratio of Correlations (HTMT) compares the average correlations between indicators of different constructs. These results were presented in Table 5 below.

Observably, DUE and BP have an HTMT value of 0.857, close to the commonly accepted threshold for discriminant validity, indicating good discriminant validity. This HTMT value is slightly above the stricter threshold (0.85) but still within the more lenient one (Hair, 2021) [8]. Likewise, DUE and CL have an HTMT value of 0.801, which is considered good for discriminant validity. These results suggest that the constructs in the model are sufficiently different, supporting the validity of the measurement model.

Table 5. Discriminant Validity (HTMT)

	Digital User Experience (DUE)	Brand Perception (BP)	Customer Loyalty (CL)
Digital User Experience (DUE)			
Brand Perception (BP)	0.857		
Customer Loyalty (CL)	0.801	0.877	

Heterotrait-monotrait (HTMT) < 0.90 (Gold et.al., 2001)

Regarding CL and BP, a value of 0.877 is slightly above the commonly accepted threshold of 0.85 for good discriminant validity. However, it is still below the more lenient threshold of 0.90 (Ab Hamid et al., 2017) [9]. This suggest that while there is some overlap between the constructs, they are likely distinct enough to be considered separate constructs.

Structural Assessment Model. A Structural Assessment Model (SAM) is used to evaluate the relationships between variables in a structural equation model (SEM) (Hair, 2021) [8]. In this discussion, we will analyze the results of hypothesis testing for the relationships between brand perception (BP), digital user experience (DUE), and consumer loyalty (CL) based on the provided sample statistics. This analysis is presented in Table 6.

Regarding H1, DUE => BP represents that DUE positively influences BP with the path coefficient value of 0.842, indicating the strength and direction of the relationship between DUE and BP. A value of 0.842 suggests a strong positive relationship. However, the standard error of the path coefficient, 0.014, measures the coefficient estimate's accuracy. Furthermore, the p-value of 0.000 indicates the statistical significance of the relationship; the result is highly significant, and the probability of the relationship occurring by chance is very low. This emphasizes that the relationship between DUE and BP is statistically significant, meaning there is strong evidence to support the hypothesis that DUE positively influences BP.

Table 6. Assessment of Structural Model

H	Structure	*B*	f^2	Standard Error	*p*-value	Remarks
H1	DUE => BP	0.842	0.531	0.014	0.000	**Significant**
H2	DUE => CL	0.785	0.386	0.025	0.000	**Significant**
H3	BP => CL	0.862	0.638	0.024	0.000	**Significant**
	DUE => BP => CL	0.602	0.567	0.023	0.000	**Significant**

Similarly, DUE => CL represents the hypothesis (H2) that DUE positively influences CL. The path coefficient value of 0.785 indicates the strength and direction of the relationship between DUE and CL. A value of 0.785 suggests a strong positive relationship. Concerning the standard error of the path coefficient, a value of 0.025 measures the accuracy of the coefficient estimate. A p-value of 0.000 indicates the result is highly significant, and the probability of the relationship occurring by chance is very low. This data suggests that the relationship between DUE and CL is

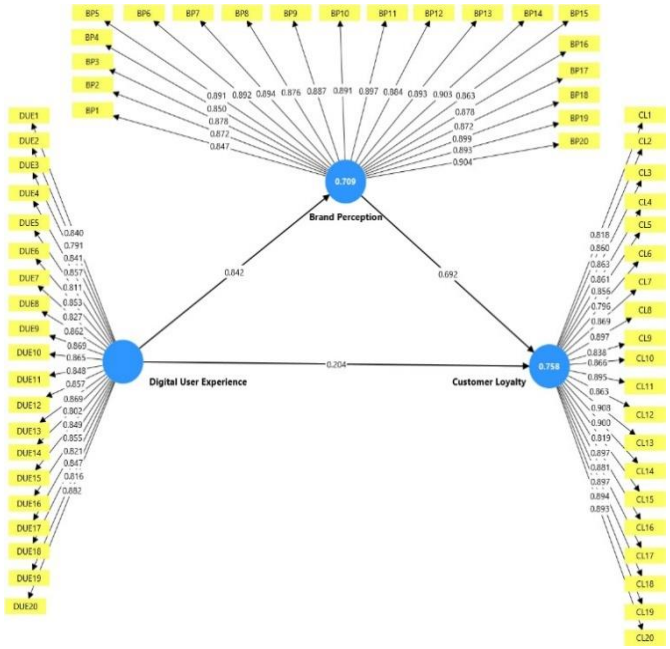

Figure1: Structural model

statistically significant, meaning there is strong evidence to support the hypothesis that Digital User Experience positively influences Customer Loyalty.

Also, BP => CL represents the hypothesis (H3) that Brand Perception (BP) positively influences Customer Loyalty (CL). A path coefficient value of 0.862 indicates the strength and direction of the relationship between BP and CL. A value of 0.862 suggests a powerful positive relationship. Additionally, the standard error of the path coefficient of 0.024 is quite small, which is generally a good sign. In hypothesis testing, a smaller standard error indicates that the estimate of the path coefficient is precise and reliable (Ren, 2009) [10]. The small standard error, combined with a significant p-value of 0.000, suggests that the relationship between the constructs is both strong and precisely estimated. This denotes that the relationship between BP and CL is statistically significant, meaning strong evidence supports the hypothesis that BP positively influences CL. The f^2 values presents the effect size of each predictor variable indicating the contribution of an exogenous construct to the R^2 value of an endogenous construct. Based on Cohen's (1988) guidelines, f^2 values of 0.02, 0.15, and 0.35 may be interpreted as small, medium, and large effect sizes, respectively [11]. For H1 (DUE => BP), the f^2 value of 0.531 indicates a large effect size, meaning that Digital User Experience (DUE) contributes substantially to the variance explained in Business Performance (BP). For H2 (DUE => CL), the f^2 value of 0.386 also represents a large effect size, suggesting that DUE has a strong impact on Customer Loyalty (CL). For H3 (BP => CL), the f^2 value of 0.638 is considered very large, signifying that Business Performance has a dominant role in explaining Customer Loyalty. Finally, for the mediation path (DUE => BP => CL), the f^2 value of 0.567 likewise indicates a large effect size, emphasizing the critical mediating role of Business

Performance in strengthening the link between DUE and CL. Figure 1 exhibits a visual presentation of the model representing the path analysis of BP, DUE, and CL.

Table 7. Variance Inflation Factor (VIF) Result

Digital User Experience		Brand Perception		Customer	
Items	VIF	Items	VIF	Items	VIF
DUE1	1.323	BP1	1.516	CL1	1.306
DUE2	1.228	BP2	1.471	CL2	1.367
DUE3	1.347	BP3	1.322	CL3	1.318
DUE4	1.317	BP4	1.300	CL4	1.415
DUE5	1.316	BP5	1.253	CL5	1.277
DUE6	1.458	BP6	1.335	CL6	1.512
DUE7	1.456	BP7	1.516	CL7	2.011
DUE8	1.327	BP8	1.444	CL8	1.739
DUE9	1.379	BP9	1.365	CL9	1.414
DUE10	1.429	BP10	1.428	CL10	1.456
DUE11	1.491	BP11	1.519	CL11	1.339
DUE12	1.457	BP12	1.470	CL12	1.430
DUE13	1.463	BP13	1.610	CL13	1.411
DUE14	1.540	BP14	1.764	CL14	1.339
DUE15	1.511	BP15	1.750	CL15	1.306
DUE16	1.597	BP16	1.371	CL16	1.338
DUE17	1.518	BP17	1.427	CL17	1.467
DUE18	1.498	BP18	1.514	CL18	1.432
DUE19	1.464	BP19	1.601	CL19	1.000
DUE20	1.312	BP20	1.420	CL20	1.000

VIF < 5.00

Table 7 presents the Variance Inflation Factor (VIF) results for Digital User Experience (DUE), Brand Perception (BP), and Customer Loyalty (CL). The VIF values for all items range from 1.000 to 2.011, which are well below the threshold of 5.00 recommended by Hair et al. (2017) [8]. This shows that multicollinearity is not a concern in the measurement model. Simply, the independent variables included in the constructs do not excessively overlap in terms of the variance they explain, allowing each indicator to provide unique and valuable information to the latent variables. As to Digital User Experience (DUE), the VIF values range between 1.228 and 1.597, showing low inter-item collinearity among its indicators. This implies that each measurement item

contributes distinctively to capturing different dimensions of digital user experience without redundancy. Asto Brand Perception (BP), VIF values range from 1.253 to 1.764, also within the acceptable range. This reveals that the items measuring brand perception are independent enough to provide reliable information, while still being conceptually related to the construct. As to Customer Loyalty (CL), the VIF values are between 1.000 and 2.011. Although CL7 depicts the highest VIF (2.011), it is still well below the critical cutoff of 5.0, suggesting no multicollinearity problem. This highlights that the indicators of customer loyalty adequately capture variations in the construct without inflating one another. Overall, the results confirm that all constructs in the study which are Digital User Experience, Brand Perception, and Customer Loyalty are free from multicollinearity issues.

5. CONCLUSION AND RECOMMENDATIONS

In conclusion, this study comprehensively examined the influence of digital user experience on brand perception and customer loyalty in the e-commerce industry specifically in the context of online retail focused on a predominantly young, digitally savvy student population.

Based on the findings there is a statistically positive relationship among digital user experience, brand perception, and customer loyalty. This emphasizes the important role of digital user experience in shaping how consumers perceive brands and subsequently their loyalty. Respondents revealed positive experiences with online retail platforms stressing the significance of usability, functionality, transparency, and responsive service. On brand perception, respondents favorably appreciated brands that demonstrate innovation, responsiveness, and strong digital engagement. Customer loyalty items indicators reflected a strong foundation of satisfaction and advocacy. Community-based motivations such as the feeling of connection to the brand was found out significant contributor to loyalty.

There are several important strategies for online retailers and marketers that can enhance digital engagement and customer loyalty. Online retailers and marketers may enhance technical performance and support by ensuring rapid and effective resolution of technical issues. This is to maintain user satisfaction and minimize disruptions in the digital shopping experience. The user experience personalized thru data-driven insights, intuitive interfaces, and personalized communications can significantly strengthen brand perception and stand-in customer loyalty.

In addition, customers become attracted when brand engagement strategies are utilized by online retailers and marketers, such as reinforcing innovative features, interactive content, and responsive customer service. Customers must be encouraged to participate in loyalty programs or referral incentives and allow them to share their experiences using the product to build a sense of community and advocacy which is an essential part to enhancing their digital engagement experiences and brand perception. Moreover, to attract customers and make repeated purchases, marketers must incentivize loyalty and address price sensitivity through tiered programs.

For future research, it is recommended to conduct longitudinal studies to track changes in the customers' loyalty, brand perception, and respondents' digital experiences. It is also suggested to include participants from different academic or professional backgrounds, and those from varying age groups to enhance the generalizability of the research findings. In addition, to gain comprehensive understanding regarding the factors that influence the relationship between digital user experience on brand perception and customer loyalty in the e-commerce industry, incorporating more variables is essential, such as external influences, product categories, and price competitiveness.

Overall, the study emphasized the vital connection between digital user experience, brand perception, and customer loyalty in online retail. It indicates that strengthening loyalty and sustaining competitive advantage in the digital marketplace requires online retailers and marketers to address the overall technical shortcomings. This includes personalizing engagement online and fostering authentic relationship with the customers.

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