

**DIGITAL LITERACY AND PRODUCT STANDARDIZATION AS DETERMINANTS OF  
MARKET ACCESS AMONG COSMETICS SMALL AND MEDIUM-SCALE ENTERPRISES  
(SMES) IN GOMBE STATE, NIGERIA**

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**Abstract**

This study examines digital literacy and product standardization as determinants of market access for cosmetics Small and Medium-Scale Enterprises (SMEs) in Gombe State, Nigeria. Motivated by the observed low digital skills and weak standardization practices among local cosmetics producers alongside the growing importance of digital tools and quality standards for market access a descriptive survey design was adopted. The infinite population included all registered and unregistered cosmetics producers in the state, with a sample of 384 respondents determined using Cochran's formula (1977). A structured questionnaire was used for data collection. Research questions were analyzed using mean and standard deviation, while hypotheses were tested via simple linear regression (0.05 significance level). Findings revealed that digital literacy exerts a moderate but statistically significant influence on market access. Basic digital skills such as using smartphones and social media enhance customer reach and product visibility. Similarly, product standardization (quality control, hygiene, packaging, labeling) also shows a moderate, significant effect on market access. The study concludes that improving digital literacy and strengthening standardization practices are essential for optimizing market access and fostering sustainable growth of cosmetics SMEs in Gombe State. Recommendations include targeted digital skills training for producers, policy support from SMEDAN and NBTE, and regulatory sensitization by NAFDAC and relevant NGOs to promote compliance and standard practices.

**Keywords:** *Digital literacy, Product standardization, SMEs, Market access, Cosmetic producers*

## Introduction

Small and Medium Enterprises (SMEs) play a critical role in stimulating innovation, creating employment, and promoting inclusive growth in developing economies. In Nigeria, the SME sector accounts for a significant portion of industrial output and national employment, serving as a foundation for local entrepreneurship and self-reliance. Despite their importance, SMEs across various sectors, particularly in the cosmetics industry, continue to struggle with limited market access, poor digital engagement, and inadequate product standardization. These challenges have hindered their capacity to grow beyond local markets and compete effectively within and outside the country (World Bank, 2023).

In Gombe State, cosmetics production is a fast-growing entrepreneurial activity, especially among small-scale producers who create soaps, creams, oils, perfumes, and other beauty products. These enterprises are predominantly informal and depend heavily on local demand within their communities. However, recent economic challenges, including inflation, high production costs, and declining consumer purchasing power, have drastically reduced sales turnover. As household incomes shrink, demand for non-essential products such as cosmetics has declined, leaving many SMEs struggling to maintain profitability and sustain operations. This situation has emphasized the urgent need for innovative strategies that can expand market reach beyond local boundaries.

Digital literacy has become a major determinant of business competitiveness in today's marketplace. Through the effective use of digital tools, SMEs can access broader markets, engage customers online, and participate in global value chains. Unfortunately, many small-scale cosmetics enterprises, particularly in Gombe State, lack the necessary digital skills to harness opportunities in e-commerce and online marketing. This deficiency limits their ability to promote their products, interact with distant buyers, or build a recognizable brand identity in the digital space. Moreover, the high cost of internet access and low awareness of digital marketing tools further widen the gap between small producers and potential global consumers (Unegbu et al., 2023).

Furthermore, a pressing issue related to the lack of product standardization remains a problem militating against effective market reach. Most local cosmetics producers operate informally, with limited adherence to quality standards, labeling requirements, and safety regulations. As a result, their products often fail to meet national or international standards, making it difficult to access regulated markets or gain consumer trust. Product standardization is a crucial requirement for expanding market access, as it assures customers of product quality, safety, and consistency. Without such measures, small producers remain confined to informal markets with limited growth potential (Awa et al., 2023).

Given these challenges, enhancing digital literacy and promoting product standardization among cosmetics SMEs can serve as key pathways for improving market access. By developing the digital competence of small-scale cosmetic entrepreneurs and encouraging adherence to product quality standards, they can increase their competitiveness, attract new customers, and access broader regional and international markets. This study, therefore, seeks to examine how digital literacy and product standardization jointly influence market access among cosmetics SMEs in Gombe State.

## Statement of the Problem

The researchers observed that despite the increasing recognition of Small and Medium Enterprises (SMEs) as drivers of economic growth and innovation, many cosmetics producers in Gombe State continue to experience declining market performance. The persistent economic recession and inflationary pressures in Nigeria have generally reduced consumers' disposable

income, leading to a decline in demand for non-essential goods such as cosmetic products. As a result, many cosmetics SMEs in the state face low sales turnover, reduced profitability, and limited capacity to reinvest in product enhancement or business expansion. Many cosmetics producers are finding it difficult to continue their normal production. Some have been forced to reduce their scale of production, which in turn lowers their profitability and overall performance.

This situation poses a threat to their survival and the employment opportunities they create. One of the fundamental causes of this problem is traced to limited digital literacy among owners of cosmetics SMEs. While digital transformation and online marketing have opened new opportunities for business growth globally, many small-scale producers in the state lack the knowledge and skills required to leverage digital tools for marketing. They remain largely excluded from e-commerce platforms and online marketplaces where modern consumers increasingly make purchases. Consequently, their market access is confined to local communities already suffering from low purchasing power, further shrinking their customer reach. Hence, these businesses find it difficult to build brand visibility with potential customers outside their immediate environment (Awa et al., 2023).

Another critical dimension of the problem is the absence of product standardization and regulatory compliance among local cosmetics producers. Many of these producers operate informally, often using untested ingredients and non-standardized packaging. Hence, most of them fail to adhere to the quality or safety benchmarks established by regulatory bodies such as the National Agency for Food and Drug Administration and Control (NAFDAC). This lack of standardization prevents them from competing in formal or export markets, consequently failing to gain consumer confidence and limiting opportunities for collaboration with larger retailers or international partners. Empirical evidence across Nigeria suggests that standardized products are more likely to attract repeat purchases and command higher market share (Ejikeme & Onwuka, 2021). Yet, little has been done to commit such practices among small cosmetics enterprises in Gombe State.

The combined effects of low digital literacy and poor product standardization have created a twin barrier to market access for cosmetics SMEs in Gombe State. Thus, if this situation is not addressed, these enterprises may continue to face declining competitiveness and eventual cessation. This will further lead to increased unemployment among women and youth who depend on cosmetics production for their livelihoods. The consequences also extend to the broader regional economy, where the cosmetics sector contributes to household income, local industrialization, and micro-entrepreneurship development.

In addition, existing studies on SMEs in Nigeria have mostly focused on access to finance, marketing strategies, or infrastructural challenges, with limited empirical attention given to how digital literacy and product standardization jointly affect market access and business growth in specific sectors like cosmetics. This gap highlights the need for a focused study within the context of Gombe State, where socio-economic and technological conditions differ from those in other states or regions. Hence, the need for this study.

### **Objectives of the Study**

The main objective of this study was to assess digital literacy and product standardization as determinants of market access among cosmetics SMEs in Gombe State, Nigeria. Specifically, the following objectives guided the study:

1. Examine digital literacy as a determinant of market access among cosmetics SMEs in Gombe State.

2. Assess product standardization as a determinant of market access among cosmetics SMEs in Gombe State.

### Research Questions

Based on the specific objectives, two research questions were raised and answered:

1. How does digital literacy determine market access among cosmetics SMEs in Gombe State?
2. How does product standardization determine market access among cosmetics SMEs in Gombe State?

### Research Hypotheses

In line with the specific objectives and research questions, the following null hypotheses were formulated and tested at the 0.05 level of significance:

**H0<sub>1</sub>:** Digital literacy has no statistically significant influence on market access among cosmetics SMEs in Gombe State.

**H0<sub>2</sub>:** Product standardization has no statistically significant influence on market access among cosmetics SMEs in Gombe State.

### Methodology

This study adopted a descriptive survey research design to assess digital literacy and product standardization as determinants of market access among cosmetics Small and Medium-Scale Enterprises (SMEs) in Gombe State, Nigeria. The target population comprised all cosmetics producers in the state, including both registered and unregistered businesses involved in the production of soaps, creams, perfumes, oils, hair products, and related cosmetics. The population of the study was considered infinite owing to the absence of a comprehensive database of cosmetics producers and the predominance of informal business operations. Thus, a sample size of 384 respondents was determined using Cochran's (1977) formula for large populations at a 0.05 level of significance. A multi-stage sampling procedure was used. First, three Local Government Areas (LGAs) Gombe, Akko, and Billiri were purposively selected due to their relatively high concentration of cosmetics production activities.

Thereafter, simple random sampling was used to select respondents from an enumeration list comprising both registered and unregistered producers. The sample was proportionally allocated across the selected LGAs: 160 respondents were selected from Gombe, 132 from Akko, and 92 from Billiri. Data were collected using a structured questionnaire titled "Digital Literacy, Product Standardization, and Market Access Questionnaire (DLPSMAQ)." The instrument was developed by the researchers from relevant literature and the objectives of the study. The instrument consisted of two sections: Section A captured demographic information, while Section B contained items measuring digital literacy, product standardization, and market access. The instrument was structured on a five-point Likert scale of Very High Influence (5), High Influence (4), Moderate Influence (3), Low Influence (2), and Very Low Influence (1). Face validity was established through expert assessment by three lecturers in the Department of Business Administration, Gombe State University. Reliability was assessed through a pilot study involving 10 cosmetics producers from Yamaltu-Deba Local Government Area, which was excluded from the main study.

Cronbach's Alpha yielded a reliability coefficient of 0.87, with subscale coefficients of 0.85 for digital literacy, 0.83 for product standardization, and 0.89 for market access. These values indicate satisfactory internal consistency. Data were collected through the direct administration of questionnaires by the researcher and two trained research assistants. Of the 384 questionnaires distributed, 357 were correctly completed and retrieved, representing a response rate of 92.9%.

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25. Specifically, mean and standard deviation were used to answer the research questions, while simple linear regression analysis was employed to test the formulated hypotheses at a 0.05 level of significance. The decision rule was set to reject the null hypothesis when the p-value is < 0.05 and not reject it when the p-value is  $\geq 0.05$ .

## Results

**Research Question One:** How does digital literacy influence market access among cosmetics SMEs in Gombe State?

**Table 1: Summary of Mean and Standard Deviation of Responses of Cosmetics Producers on the Influence of Digital Literacy on Market Access**

S/N	Item Statement (N = 357)	$\bar{x}$	$\sigma$	Remarks
1	My ability to use smartphones for business operations influences my access to markets.	3.41	0.91	MI
2	My skill in advertising products on social media influences my access to wider markets.	3.28	0.94	MI
3	My ability to respond to customers online influences my access to wider markets.	3.11	0.97	MI
4	My WhatsApp and Facebook skills for sales promotion influence my access to markets.	3.47	0.88	MI
5	My understanding of online marketplaces like e-commerce platforms enhances my knowledge to sell products beyond my immediate locality.	2.66	1.09	MI
6	My skill in navigating and managing online marketplace platforms increases my opportunities to access new customer segments.	2.54	1.12	MI
7	The skills I have for creating and designing digital content influence my access to wider markets.	2.12	1.03	LI
<b>Grand Mean</b>		<b>3.08</b>		<b>MI</b>

The result in Table 1 above indicates that digital literacy exerts a moderate influence on market access among cosmetics SMEs in Gombe State (grand mean = 3.08). Respondents demonstrated moderate competence in using smartphones for business operations, advertising on social media, responding to customers online, and utilizing WhatsApp and Facebook for sales. However, low influence was observed for advanced digital skills such as digital content creation, indicating a gap in creative and technical digital capabilities. Generally, the findings suggest that while basic digital skills support market access, limited advanced digital literacy constrains broader market extension.

**Research Question Two:** How does product standardization influence market access among cosmetics SMEs in Gombe State?

**Table 2: Summary of Mean and Standard Deviation of Responses of Cosmetics Producers on the Influence of Product Standardization on Market Access**

S/N	Item Statement (N = 357)	$\bar{x}$	$\sigma$	Remark
1	The use of appropriate packaging for my products influences my access to markets.	2.98	1.01	MI
2	Clear labeling for my products influences my access to markets.	2.87	1.07	MI
3	Obtaining product certification has influenced my access to wider markets.	2.72	1.10	MI
4	My effort in adhering to hygienic production procedures influences my access to markets.	3.34	0.89	MI
5	My knowledge of NAFDAC standard requirements influences my access to markets.	2.21	1.02	LI
6	The listing of product ingredients influences my access to markets.	1.89	0.97	LI
7	Consistency in product quality influences my access to markets.	3.07	0.94	MI
<b>Grand Mean</b>		<b>2.73</b>		<b>MI</b>

The result in Table 2 above shows that product standardization has a moderate influence on market access among cosmetics SMEs in Gombe State (grand mean = 2.73). Respondents reported moderate compliance with hygienic production procedures, product quality consistency, packaging, and labeling. However, low influence was recorded for knowledge of NAFDAC requirements and the listing of product ingredients, indicating weak regulatory compliance. This gap limits business credibility and growth potential, especially in formal and wider markets.

**H0<sub>1</sub>: Digital literacy has no statistically significant influence on market access among cosmetics SMEs in Gombe State.**

**Table 3a: Model Summary of the Influence of Digital Literacy on Market Access among Cosmetics SMEs**

R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error
.611a	.374	.370	-

The result in Table 3a above shows a correlation coefficient (R) of 0.611, indicating a strong positive relationship between digital literacy and market access among cosmetics SMEs in Gombe State. The coefficient of determination (R<sup>2</sup>) of 0.374 implies that digital literacy explains 37.4% of the variation in market access. This suggests that improvements in digital literacy substantially enhance the ability of cosmetics SMEs to access wider markets, although other factors also contribute to market access.

**Table 3b: ANOVA from Regression Analysis of the Influence of Digital Literacy on Market Access among Cosmetics SMEs**

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	-	1	-	72.93	.000
Residual	-	-	-	-	-
Total	-	-	-	-	-

The result in Table 3b above indicates that the regression model is statistically significant, as shown by the F-value of 72.93 with a significance level of 0.000. Since the p-value is less than 0.05, the model is statistically significant. This confirms that digital literacy significantly predicts market access among cosmetics SMEs in Gombe State.

**Table 3c: Coefficients of Regression Analysis of the Influence of Digital Literacy on Market Access among Cosmetics SMEs**

Model	B	Std. Error	Beta	t	Sig.
(Constant)	1.142	.181	-	6.30	.000
Digital Literacy	.482	.056	.611	8.54	.000

The result in Table 3c above reveals that digital literacy has a positive and significant influence on market access among cosmetics SMEs in Gombe State ( $B = 0.482$ ,  $\beta = 0.611$ ,  $t = 8.54$ ,  $p < 0.05$ ). This implies that a unit increase in digital literacy leads to an increase in market access. Given that the p-value is less than 0.05, the null hypothesis ( $H_{01}$ ) is rejected. Therefore, digital literacy significantly influences market access among cosmetics SMEs in Gombe State.

**H0<sub>2</sub>: Product standardization has no statistically significant influence on market access among cosmetics SMEs.**

**Table 4a: Model Summary of the Influence of Product Standardization on Market Access among Cosmetics SMEs**

R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error
.367a	.135	.131	-

The result in Table 4a above shows an R-value of 0.367, indicating a moderate positive relationship between product standardization and market access among cosmetics SMEs in Gombe State. The R<sup>2</sup> value of 0.135 indicates that product standardization accounts for 13.5% of the variation in market access. This suggests that while product standardization contributes to market access, a large proportion of growth is influenced by other factors not captured in the model.

**Table 4b: ANOVA from Regression Analysis of the Influence of Product Standardization on Market Access among Cosmetics SMEs**

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	-	1	-	19.62	.000
Residual	-	-	-	-	-
Total	-	-	-	-	-

The result in Table 4b above shows an F-statistic of 19.62 with a significance level of 0.000. Since the p-value is less than 0.05, the regression model is statistically significant. This indicates that product standardization significantly predicts market access among cosmetics SMEs in Gombe State.

**Table 4c: Coefficients of Regression Analysis of the Influence of Product Standardization on Market Access Among Cosmetics SMEs**

Model	B	Std. Error	Beta	t	Sig.
(Constant)	1.507	.188	-	8.01	.000
Product Standardization	.288	.065	.367	4.43	.000

The result in Table 4c above indicates that product standardization has a positive and statistically significant influence on market access among cosmetics SMEs in Gombe State ( $B = 0.288$ ,  $\beta = 0.367$ ,  $t = 4.43$ ,  $p < 0.05$ ). This means that improvements in product standardization lead to an increase in market access. Since the p-value is less than 0.05, the null hypothesis ( $H_0$ ) is rejected.

### Discussion of the Findings

The findings of the study revealed that digital literacy has a moderate but statistically significant influence on market access among cosmetics SMEs in Gombe State. This implies that cosmetics SME producers who possess basic digital skills, such as the ability to use smartphones for business communication, advertise products on social media platforms, and interact with customers online, are better positioned to access wider markets beyond their immediate localities. However, the relatively low levels of advanced digital skills, which include digital content creation and knowledge of online marketplaces, suggest that market expansion remains constrained.

This finding is consistent with the Diffusion of Innovation Theory (DOI) proposed by Rogers (2003). According to the theory, the adoption of innovation begins with the knowledge stage, where individuals become aware of new technologies. In the context of this study, the moderate digital literacy observed among cosmetics SMEs indicates partial progression through the knowledge and persuasion stages of innovation adoption. While SME operators recognize the relative advantage of digital tools for market access, perceived complexity and limited trialability of advanced digital applications appear to hinder full adoption and implementation. Hence, SMEs adopt basic digital practices but hesitate to engage deeply with more sophisticated digital innovations that could further expand their market reach.

Empirically, the finding aligns with the results of Eze and Obi (2024), who reported that digital marketing adoption significantly enhances market access and SME performance in Nigeria, particularly through social media engagement and responsiveness to online inquiries. Similarly, Awotunde et al. (2024) found that online marketing and ICT initiatives positively influence SME competitiveness and growth, emphasizing improved visibility and customer engagement. The current study also supports Nwabuatu (2024), who observed that digital technologies contribute to market expansion and customer reach, although adoption levels vary due to financial and infrastructural constraints.

Moreover, the result is consistent with Ajayi and Adekunle (2023) and Umetiti et al. (2023), who both found a positive and significant relationship between digital literacy and SME performance in Nigeria. These studies emphasize that digital skills such as online communication and social media engagement improve customer reach and market penetration. The present study extends these findings by focusing specifically on cosmetics SMEs in Gombe State, thereby providing sector- and location-specific evidence that digital literacy remains a critical driver of market access.

However, the finding differs slightly from Novela et al. (2024), who reported a stronger influence of digital literacy on SME performance through the mediating role of entrepreneurial skills. The relatively moderate influence observed in this study may be attributed to contextual differences, including infrastructural limitations, lower digital exposure, and limited access to training

opportunities. Generally, the findings emphasize that while digital literacy facilitates market access, incomplete diffusion of advanced digital innovations limits the extent of market expansion among cosmetics SMEs.

The finding from the test of hypothesis two (H<sub>02</sub>) revealed that product standardization has a moderate and statistically significant influence on market access among cosmetics SMEs in Gombe State. This indicates that practices such as hygienic production processes, consistent product quality, appropriate packaging, and clear labeling contribute positively to market expansion. However, low levels of compliance with regulatory requirements particularly knowledge of NAFDAC guidelines and submission for certification were found to limit the overall wider market reach of cosmetics SMEs. This result is consistent with Ilesanmi and Oyedepo (2023), who reported that while digital marketing improves SME performance, sector-specific factors such as regulatory compliance and standardization remain critical. This observation reinforces the current study's finding that weak regulatory compliance constrains market expansion despite improvements in marketing strategies.

Furthermore, the findings by Eze and Obi (2024), who reported that regulatory non-compliance limits access to formal markets and distribution channels, complement the present findings. The DOI framework further explains this outcome by highlighting that SMEs may delay adoption when innovations are perceived as risky or resource-intensive. Without adequate awareness, demonstrations, and regulatory support, cosmetics SMEs are less likely to fully adopt product standardization measures that promote market expansion.

## Conclusion

Based on the findings of the study, it is concluded that digital literacy and product standardization significantly influence market access among cosmetics SMEs in Gombe State, Nigeria. Cosmetics producers who possess higher levels of digital literacy appear to be in a better position to access broader markets, promote their products effectively through online platforms, communicate efficiently with customers, and adapt to changing market dynamics. Digital skills enable SMEs to rise above traditional markets and tap into regional and online customer bases, thereby enhancing wider market access. In the same vein, adherence to product standardization practices plays a vital role in improving market access. Standardized products that meet quality, hygiene, packaging, labeling, and regulatory requirements inspire consumer confidence and facilitate entry into formal and competitive markets. Product standardization not only enhances brand credibility but also reduces market barriers, making it easier for cosmetics SMEs to scale their operations and sustain long-term growth. The study, therefore, concludes that the combined enhancement of digital literacy and product standardization is essential for strengthening the visibility, competitiveness, and general performance of cosmetics SMEs in Gombe State. Without adequate digital skills and standardized production practices, cosmetics SMEs are likely to remain constrained to limited local markets with reduced growth potential.

## Recommendations

Based on the findings and conclusions of this study, the following recommendations are made:

1. Cosmetics SME producers should invest in improving their digital literacy skills, particularly in the use of smartphones, social media marketing, and e-commerce platforms. Regular training and self-development in basic digital tools will enhance their ability to reach wider markets.
2. Cosmetics producers should prioritize product standardization practices, including proper quality control, hygienic production processes, accurate labeling, and compliance with regulatory standards. In addition, SME support institutions such as the NBTE, SMEDAN,

NAFDAC, and relevant NGOs should organize regular capacity-building programmes focused on product standardization practices for cosmetics producers. These programmes should be practical and affordable.

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