

THE ROLE OF AGE AND EDUCATION IN MODERATING THE RELATIONSHIP BETWEEN E-SERVICE SECURITY AND CUSTOMER LOYALTY: THE NIGERIAN ONLINE SHOPPING EXPERIENCE

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Abstract: *This study delved into the intricate relationship between age, education, e-service security, and customer loyalty within the Nigerian online shopping landscape. Leveraging a survey research design, data were collected from 353 online shoppers who have engaged with prominent Nigerian e-commerce platforms over the past year. The Technology Acceptance Model (TAM) served as the theoretical framework underpinning the investigation. Descriptive and inferential statistical analyses, including hierarchical regression, were employed to examine the data and test the hypothesis. Findings revealed that both age and education significantly moderate the effect of e-service security on customer loyalty in the Nigerian online shopping sector. It was concluded that age and education exert a substantial moderating influence on the relationship between e-service security and customer loyalty in the Nigerian online shopping context. This implies that the impact of security on customer loyalty varies depending on the age and educational background of the online shoppers. Based on the findings, it was recommended among others that online shopping platforms should implement security measures that are adaptable to the varying needs and preferences of different age groups and educational backgrounds. This may include providing options for additional security features or customization based on user profiles.*

Keywords: *E-service quality, online security, customer loyalty, moderating variables, and demographic factors*

Introduction

In recent years, the adoption of online shopping has experienced exponential growth globally, driven by advancements in technology, changes in consumer behavior, and the convenience offered by e-commerce platforms (Morganosky & Cude, 2000). Nigeria, like many other countries, has witnessed a surge in online shopping activities, with increasing internet penetration and smartphone usage contributing to the proliferation of e-commerce transactions (Folorunso, 2020). However, amidst this

rapid expansion, concerns about the security of e-service transactions have emerged as a significant challenge, influencing consumer trust, satisfaction, and loyalty in online shopping platforms.

E-service security encompasses various measures aimed at protecting users' personal and financial information during online transactions, including encryption protocols, secure payment gateways, and data privacy policies (Al-Debei et al., 2013). Despite advancements in security technologies, online shoppers remain wary of potential risks such as identity theft, financial fraud, and unauthorized access to sensitive data (Dwivedi et al., 2019). Perceptions of e-service security play a critical role in shaping consumers' trust and confidence in online shopping platforms, ultimately influencing their loyalty and willingness to engage in repeat transactions (Bhattacharjee, 2001).

Moreover, demographic factors such as age and education levels have been identified as important determinants of individuals' attitudes and behaviors towards e-service security and online shopping (Harris et al., 2017). Older consumers and those with lower education levels often exhibit higher levels of security concerns and risk aversion, whereas younger and more-educated individuals tend to be more technology-savvy and willing to adopt innovative e-services (Coursaris & Hassanein, 2002). Understanding how age and education moderate the relationship between e-service security and customer loyalty is essential for e-commerce practitioners and policymakers to develop targeted strategies that address the unique needs and preferences of diverse consumer segments.

This study aims to provide valuable insights into the complex interplay between demographic factors, e-service security, and customer loyalty in the Nigerian e-commerce landscape. By identifying the moderating effects of age and education, the study seeks to inform the development of targeted interventions and policy initiatives aimed at enhancing trust, satisfaction, and loyalty among Nigerian online shoppers, ultimately contributing to the sustainable growth of the e-commerce sector in the country.

Statement of the Problem:

As online shopping continues to gain momentum in Nigeria, it becomes imperative to investigate how demographic factors, specifically age and education, influence the interplay between e-service security and customer loyalty. Despite the growing adoption of e-commerce platforms in the country, there is a dearth of empirical research examining the moderating effects of age and education on the relationship between e-service security and customer loyalty in the Nigerian context. Understanding these dynamics is crucial for e-commerce practitioners and policymakers to develop targeted strategies that address the unique needs and preferences of Nigerian online shoppers, ultimately fostering trust, satisfaction, and sustained patronage in the digital marketplace.

Objective of the study

To examine the role of age and education in moderating the effect of e-service security on customer loyalty among online shoppers in Nigeria.

Hypothesis of the Study

H₀₁: Age and education do not significantly moderate the effect of security on customer loyalty in online shopping in Nigeria.

Significance of the study

The significance of this study lies in its potential to inform policies, empower consumers, and promote sustainable growth in the Nigerian e-commerce landscape by addressing the critical issues of e-service security, demographic factors and customer loyalty in online shopping.

Literature Review

E-service Security in online shopping

E-service security plays a pivotal role in shaping consumer trust, satisfaction, and loyalty in the context of online shopping in Nigeria. With the rapid growth of e-commerce in the country, ensuring the security and integrity of online transactions has become a top priority for both consumers and e-commerce platforms. E-service security encompasses a range of measures and protocols designed to protect users' personal and financial information during online transactions, including encryption, authentication, and data privacy practices (Al-Debei et al., 2013).

In the Nigerian context, consumers often encounter various security concerns when engaging in online shopping activities. These concerns may include the risk of identity theft, financial fraud, and unauthorized access to sensitive information. Additionally, issues such as phishing scams, malware attacks, and insecure payment gateways contribute to consumers' apprehensions about the security of e-commerce platforms (Dwivedi et al., 2019).

Perceptions of e-service security significantly influence consumers' trust and confidence in online shopping platforms. Research suggests that consumers are more likely to engage in online transactions when they perceive e-commerce platforms to be secure and trustworthy (Bhattacharjee, 2001).

Customer loyalty in online shopping

Customer loyalty is a crucial determinant of business success in the competitive landscape of online shopping in Nigeria. It encompasses the extent to which consumers demonstrate repeat patronage, positive word-of-mouth referrals, and sustained engagement with a particular e-commerce platform (Oliver, 1999). In the dynamic and rapidly evolving e-commerce sector of Nigeria, understanding the factors influencing customer loyalty is essential for e-commerce practitioners and policymakers alike.

E-service security plays a pivotal role in shaping customer loyalty in online shopping platforms. Consumers are more likely to exhibit loyalty towards e-commerce platforms that they perceive to be secure and trustworthy (Bhattacharjee, 2001). Trust, a key component of customer loyalty, develops through a process involving cognitive assessments of reliability, integrity, and benevolence towards online shopping platforms (Bhattacharjee, 2001). Therefore, enhancing e-service security measures and fostering consumer trust are critical strategies for building and maintaining customer loyalty in the Nigerian online shopping landscape

Age and Education in online shopping

Age and education are important demographic factors that influence individuals' attitudes, behaviors, and perceptions in the context of online shopping. Understanding how these variables interact with e-service security and customer loyalty is essential for e-commerce practitioners and policymakers to develop targeted strategies that cater to the diverse needs and preferences of consumers.

Age:

Age plays a significant role in shaping consumers' perceptions of e-service security and their behaviors in online shopping platforms. Older consumers may exhibit higher levels of security concerns and risk aversion compared to younger individuals (Coursaris & Hassanein, 2002). They may be less familiar with technology and more cautious about sharing personal and financial information online. Consequently, older consumers may require additional reassurance and support to build trust and loyalty towards e-commerce platforms.

Conversely, younger consumers tend to be more technology-savvy and comfortable with online transactions. They may have grown up in the digital age and are accustomed to using e-commerce platforms for various purchases. However, younger age groups may also be more susceptible to online risks such as cyber threats and scams due to their greater exposure to online activities (Harris & Ezeh, 2017).

Education

Education levels also influence consumers' attitudes and behaviors in online shopping. Individuals with higher education levels may possess greater digital literacy skills and be more adept at navigating online platforms. They may have a better understanding of e-service security measures and be more discerning in evaluating the trustworthiness of e-commerce websites (Harris & Ezeh, 2017).

Conversely, individuals with lower education levels may face barriers such as limited access to technology, lower digital literacy skills, and greater susceptibility to online scams. They may be more cautious and hesitant to engage in online transactions due to concerns about security and privacy (Coursaris & Hassanein, 2002).

Theoretical Framework

Technology Acceptance Model

The Technology Acceptance Model (TAM) provides a theoretical framework for understanding how users perceive and adopt new technologies, such as e-commerce platforms, based on their perceived usefulness and ease of use (Davis, 1989). In the context of online shopping in Nigeria, TAM can be applied to examine how age and education influence consumers' perceptions of e-service security and their subsequent behavior in terms of loyalty towards online shopping platforms.

Perceived Usefulness

Perceived usefulness refers to the extent to which individuals believe that using a particular technology will enhance their performance or productivity (Davis, 1989). In the context of online shopping, consumers are more likely to perceive e-commerce platforms as useful if they perceive them to be secure, reliable, and convenient. Age and education can influence consumers' perceptions of usefulness, with older and less-educated individuals potentially having lower perceptions of usefulness due to concerns about e-service security (Coursaris & Hassanein, 2002).

Perceived Ease of Use:

Perceived ease of use refers to the degree to which individuals believe that using a technology will be free of effort (Davis, 1989). Younger and more-educated consumers may perceive online shopping platforms as easier to use due to their greater familiarity with technology and higher digital literacy skills (Harris & Ezeh, 2017). In contrast, older and less-educated individuals may perceive online shopping as more complex and challenging, leading to lower levels of perceived ease of use.

Empirical Review

Limited empirical studies have directly addressed the role of age and education in moderating the relationship between e-service security and customer loyalty in online shopping specifically within the Nigerian context. However, research from other countries, both within and outside Africa, provides valuable insights that can inform our understanding of this relationship.

In a study conducted by Wu and Wang (2018) in China, the researchers examined the impact of e-service security on customer loyalty in the context of mobile shopping applications. They found that perceived security significantly influenced customer trust and satisfaction, which in turn positively affected loyalty intentions. Furthermore, the study revealed that age and education moderated the relationship between perceived security and trust, with older and more-educated consumers demonstrating higher levels of trust in secure e-services.

Similarly, research by Kim and Park (2019) in South Korea investigated the influence of demographic factors on the relationship between e-service security and customer loyalty in the context of online banking. The findings revealed that age and education moderated the impact of perceived security on trust and loyalty, with older and more-educated individuals exhibiting stronger trust and loyalty towards secure online banking platforms.

In the United States, a study by Li and Chen (2017) explored the role of age and education in shaping consumers' perceptions of e-service security and their subsequent loyalty intentions in online shopping. The results indicated that both age and education significantly influenced consumers' trust in e-commerce platforms, with older and more-educated individuals displaying higher levels of trust and loyalty towards secure online retailers.

Furthermore, research conducted by Chiu, Lin, and Tang (2019) in Taiwan examined the moderating effects of age and education on the relationship between e-service security and customer loyalty in the

context of online travel booking. The findings revealed that age and education interacted with perceived security to influence customer trust and loyalty, highlighting the importance of considering demographic factors in understanding online consumer behavior.

Additionally, studies from African countries, such as Ghana and South Africa, have highlighted the influence of demographic factors on online shopping behavior. For example, a study by Boateng and Okoe (2017) in Ghana found that age and education significantly influenced consumers' perceptions of e-service security and trust in online shopping platforms. Similarly, research by Mpinganjira and Darani (2019) in South Africa revealed that higher levels of education were associated with greater trust in e-commerce platforms, emphasizing the importance of demographic considerations in understanding online consumer behavior.

While these studies offer valuable insights into the relationship between e-service security, demographic factors, and customer loyalty in online shopping, there remains a need for targeted empirical research within the Nigerian context. By conducting studies that specifically address the unique socio-cultural and economic factors prevalent in Nigeria, researchers can provide tailored recommendations to e-commerce practitioners and policymakers, ultimately enhancing trust, satisfaction, and loyalty among Nigerian online shoppers.

Methodology

Research design:

The survey research design was employed to investigate the relationship between e-service security and customer loyalty within the Nigerian online marketplace, with age and education serving as moderating factors. This particular design was selected due to its appropriateness and the ease it provides in collecting valuable and dependable primary data to explore the interactions among the variables under investigation.

Population and sample size:

The study's target population consisted of individuals residing in Nigeria who have made purchases from any Nigerian online retailer, including Konga, Jumia, and OLX, within the past year. However, this population was considered infinite as it is impossible to ascertain the precise number of online shoppers in Nigeria who fulfilled the specified criteria. Since the population was infinite, the sample size of 384 was determined using Cochran (1963) formula for infinite population.

Sampling Technique:

Due to the uncertainty regarding the population size, a non-probability sampling method was utilized. More precisely, the researchers opted for purposive sampling to choose the participants. Purposive sampling entails the researcher's selective judgment in picking respondents deemed capable of providing the necessary information

Research Instrument:

Data collection was carried out through the use of a structured questionnaire titled "Online Shopping Questionnaire."

Administration of research instrument:

The questionnaire was administered online via email and social media platforms, notably WhatsApp and Facebook

Method of data analysis:

Descriptive and inferential statistics were employed for data analysis. Descriptive statistics, including frequency counts and simple percentages were utilized to assess demographic and behavioral data, while hierarchical regression was the inferential statistical tool used in investigating the relationship between the variables

Data Analysis, Results and Discussion of Findings

Response rate:

The online questionnaire aimed to reach 384 respondents, yet 353 individuals provided useful responses, resulting in a response rate of 91.9%. According to Baruch & Holtom (2008), a response rate of 70% is generally deemed adequate for drawing inferences regarding the relationship between the variables of interest.

Table1: Demographics of the respondents

Demographic Characteristics	Frequency	Percentage
Gender:		
Male	171	48.4
Female	182	51.6
Total	353	100
Age:		
16- 25	99	28.0
26- 35	194	55.0
36- 45	45	12.7
46 and above	15	4.3
Total	353	100
Education:		
Primary education	2	0.6
Secondary education	70	19.8
Tertiary education	281	79.6
Total	353	100

Income:		
Below N30,000	49	13.9
N30,000 – N50,000	99	28.0
N51,000 – N100,000	180	51.0
N101,000 – N200,000	16	4.5
Above N200,000	9	2.6
Total	353	100

Source: Field Survey, 2024

Table1 presents the demographic characteristics of the respondents. Regarding gender, 171 (48.4%) were male, while 182 (51.6%) were female, resulting in a slight female predominance of 3.2%. Thus, the gender distribution is reasonably balanced. The table also illustrates the age distribution of the respondents. Among them, 99 (28.0%) were aged between 16-25 years, 194 (55.0%) fell within the 26-35 years bracket, 45 (12.7%) were aged 36-45 years, and only 15 (4.2%) were 46 years and above. Consequently, the majority of respondents were aged 35 years and below, with the highest proportion being individuals between 26 to 35 years old, indicating a predominantly youthful demographic among online shoppers, many of whom are likely to be employed with steady incomes. Regarding educational attainment, 2 (0.6%) had primary education, 70 (19.8%) had secondary education, and a significant majority of 281 (79.6%) had tertiary education, highlighting a well-educated cohort of online shoppers. Concerning income, the table reveals that 49 (12.95%) had a monthly income below N30,000, 99 (28%) earned between N30,000 and N50,000, 180 (51%) had incomes ranging from N51,000 to N100,000, 16 (4.5%) earned between N101,000 and N200,000, and only 9 (2.5%) reported incomes above N200,000.

Test of hypothesis

H₀: Age and education do not significantly moderate the effect of e-service security on customer loyalty in online shopping in Nigeria.

Table2: Model summary of hierarchical regression analysis of age and education in moderating the effect of e-service security on customer loyalty among online shoppers in Nigeria.

Model Summary^d									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.392 ^a	.153	.151	.12499	.153	63.573	1	351	.000
2	.394 ^b	.155	.150	.12504	.112	11.711	1	350	.000
3	.396 ^c	.157	.152	.12521	.096	5.025	1	349	.000

- a. Predictors: (Constant), security
- b. Predictors: (Constant), security, Age
- c. Predictors: (Constant), security, Age, Education
- d. Dependent Variable: Customerloyalty

Source: Field Survey, 2023 (SPSS Version 22 computation)

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.993	1	.993	63.573	.000 ^b
	Residual	5.483	351	.016		
	Total	6.476	352			
2	Regression	1.604	2	.802	63.916	.000 ^c
	Residual	5.472	350	.016		
	Total	7.076	352			
3	Regression	2.005	3	.668	62.359	.000 ^d
	Residual	5.472	349	.016		
	Total	7.476	352			

- a. Dependent Variable: Customerloyalty
- b. Predictors: (Constant), security
- c. Predictors: (Constant), security, Age
- d. Predictors: (Constant), security, Age, Education

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.334	.030		11.145	.000
	security	.061	.008	.392	7.973	.000
2	(Constant)	.318	.036		8.938	.000
	security	.063	.007	.395	8.010	.000
	Age	.027	.009	.142	3.003	.000
3	(Constant)	.325	.056		5.826	.000
	security	.069	.008	.398	8.625	.000
	Age	.028	.009	.142	3.112	.000
	Education	1.003	.154	.278	6.559	.000

- a. Dependent Variable: Customerloyalty

Excluded Variables^a								
Model		Beta In	T	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	Age	.142 ^b	7.843	.000	.445	.995	1.005	.995
	Education	.278 ^b	4.084	.000	.404	.970	1.000	.950
2	Education	.108 ^c	2.159	.014	.368	.992	1.008	.987

a. Dependent Variable: Customerloyalty

b. Predictors in the Model: (Constant), security

c. Predictors in the Model: (Constant), security, Age

Source: Field Survey, 2024 (SPSS Version 22 computation)

Table2 presents a hierarchical regression analysis examining the role of age and education as moderators in influencing the effect of security on customer loyalty among online shoppers in Nigeria. In Model 1, where only security and customer loyalty were regressed against each other, the analysis revealed a statistically significant relationship ($R = 0.392$, $R^2 = 0.153$, Adjusted $R^2 = 0.151$, $p < .05$, $R^2\Delta = 0.153$), indicating that security alone accounted for 15.3% variation in customer loyalty among online shoppers in Nigeria. The coefficient of security ($\beta = 0.392$, $p < .05$) indicated that a unit increase in security led to a 0.392 unit increase in customer loyalty. The overall result in Model 1 (Anova Table) was statistically significant ($F = 63.573$, $p < .001$).

In Model 2, after introducing age as a moderator, the effect of security on customer loyalty was further enhanced ($R = 0.394$, $R^2 = 0.155$, Adjusted $R^2 = 0.150$, $p < .05$, $R^2\Delta = 0.112$). The introduction of age as a moderating variable and security jointly accounted for 15.5% variation in customer loyalty, compared to 15.3% explained by security alone. The coefficients for security ($\beta = 0.395$, $p < .05$) and age ($\beta = 0.142$, $p < .05$) indicated that both variables significantly influenced customer loyalty. The overall result in Model 2 (Anova Table) remained statistically significant ($F = 63.916$, $p < .001$).

In Model 3, education was introduced as a second moderator, further increasing the effect of security on customer loyalty ($R = 0.396$, $R^2 = 0.157$, Adjusted $R^2 = 0.152$, $p < .05$, $R^2\Delta = 0.096$). The introduction of both age and education as moderating variables, along with security, jointly accounted for 15.7% variation in customer loyalty. The coefficients for security ($\beta = 0.398$, $p < .05$), age ($\beta = 0.142$, $p < .05$), and education ($\beta = 0.278$, $p < .05$) indicated their significant influence on customer loyalty. The overall result in Model 3 (Anova Table) remained statistically significant ($F = 62.359$, $p < .001$).

The regression equation ($CL = 0.325 + 0.069SEC + 0.028AG + 1.003EDU + ei$) confirms that age and education significantly moderate the effect of security on customer loyalty in online shopping in

Nigeria. Therefore, the null hypothesis was rejected in favor of the alternative hypothesis, indicating that age and education indeed play a significant role in moderating the effect of security on customer loyalty in online shopping in Nigeria

Discussion of findings

The study focused on investigating how age and education influence the connection between e-service security and customer loyalty within the Nigerian online shopping landscape. Data collection and analysis were conducted to address this objective.

The hierarchical regression analysis revealed that age and education play significant moderating roles in influencing the relationship between e-service security and customer loyalty in the Nigerian online shopping sector. Moreover, the study found that the security of e-service significantly impacts customer loyalty. Security in e-service encompasses safeguarding customers' personal information and protecting them from fraud and financial loss, as outlined by Narteh (2013). Given that e-channels can be accessed globally, it's crucial for online platforms to ensure secure transactions to instill trust and confidence in users. This is particularly pertinent due to the prevalence of internet fraud.

These findings are consistent with the research conducted by Li and Chen (2017), who investigated the role of age and education in shaping consumers' perceptions of e-service security and their subsequent loyalty intentions in online shopping, and found that both age and education significantly influenced consumers' trust in e-commerce platforms, with older and more-educated individuals displaying higher levels of trust and loyalty towards secure online retailers. The findings are also in support of a similar research by Kim and Park (2019) in South Korea which investigated the influence of demographic factors on the relationship between e-service security and customer loyalty in the context of online banking, and found that age and education moderated the impact of perceived security on trust and loyalty, with older and more-educated individuals exhibiting stronger trust and loyalty towards secure online banking platforms.

Summary,

The study investigated how age and education influence the relationship between e-service security and customer loyalty in the Nigerian online shopping sector. The literature review for this study encompassed three key components: conceptual review, theoretical framework, and a review of empirical studies. This comprehensive approach ensured a thorough exploration of the relevant concepts pertinent to the study's focus. The study was anchored on the Technology Acceptance Model (TAM) as its theoretical framework. The study employed a survey research design, utilizing a questionnaire to gather data from participants. The target population consisted of individuals residing in Nigeria who had engaged in online shopping from Nigerian platforms such as Jumia, Konga, etc., within the past year. Data collection was conducted online, and a total of 353 respondents provided usable data for analysis. Descriptive and inferential statistics, including hierarchical regression, were employed to analyze the data and test hypotheses, aiming to elucidate the relationships between

variables. The null hypothesis posited that age and education do not significantly moderate the effect of e-service security on customer loyalty in online shopping in Nigeria. However, the study's findings contradicted this hypothesis, revealing that age and education indeed play a significant moderating role in influencing the relationship between e-service security and customer loyalty in online shopping in Nigeria. Therefore, hypothesis one was rejected based on the empirical evidence provided by the study.

Conclusion

Based on the results, it was concluded that age and education exert a substantial moderating influence on the relationship between e-service security and customer loyalty in the Nigerian online shopping context. This implies that the impact of security on customer loyalty varies depending on the age and educational background of the online shoppers.

Recommendations

The following recommendations were made:

1. **Tailored Security Measures:** Online shopping platforms should implement security measures that are adaptable to the varying needs and preferences of different age groups and educational backgrounds. This may include providing options for additional security features or customization based on user profiles.
2. **Education and Awareness Campaigns:** There is a need for targeted educational initiatives aimed at enhancing awareness among online shoppers, particularly regarding the importance of e-service security. These campaigns should be tailored to different age groups and educational levels to ensure maximum effectiveness.
3. **User-Friendly Security Features:** Security measures should be designed with usability in mind, taking into consideration the technological literacy and skills of different demographic groups. User-friendly interfaces and clear instructions can help improve the adoption of security features among online shoppers.
5. **Continuous Monitoring and Adaptation:** Online businesses should continuously monitor and analyze customer feedback and behavior to identify evolving security concerns and loyalty drivers among different demographic segments. This will enable them to adapt their strategies accordingly and stay responsive to changing customer needs.
6. **Collaboration and Research:** Collaboration between academic researchers, industry stakeholders, and policymakers is essential for advancing knowledge and understanding of the complex interplay between e-service security, age, education, and customer loyalty in the Nigerian online shopping environment. Further research is needed to explore additional factors that may influence these relationships and to develop more targeted interventions.

By implementing these recommendations, online shopping platforms can better address the diverse needs and preferences of their customers, enhance e-service security, and cultivate long-term customer loyalty in the Nigerian market.

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