



ADOPTION AND UTILIZATION OF ARTIFICIAL INTELLIGENCE TOOLS IN MARKETING CONSUMER GOODS IN NIGERIA

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Abstract

The study examined the adoption and utilization of artificial intelligence tools in marketing consumer goods in Nigeria. The study adopted a descriptive survey design. The population comprised 516 registered enterprises in Cross River State. The instrument for data collection was a researcher's self-designed questionnaire titled Adoption and Utilization of Artificial Intelligence Tools in Marketing Consumer Goods Rating Scale (AUAIMCGRS). The instrument was validated by two experts in the Department of Business Education at the University of Calabar and tested for reliability using the Cronbach alpha coefficient, which yielded a coefficient of 0.87. Data were analyzed using mean and standard deviation to answer the research questions, and an independent t-test was used to test the research hypotheses. The findings of the study indicate that the adoption of utilization of content creation and curation tools and automated email marketing tools enhances the marketing of consumer goods in Nigeria. It was recommended, among other things, that the brands should continue to adopt AI-driven content creation and automated email marketing tools to streamline and enhance their marketing efforts.

Keywords: Artificial intelligence, tools, marketing, consumer and goods

Introduction

The rapid advancement of technology in the 21st century has significantly transformed industries across the globe, with artificial intelligence (AI) standing out as one of the most disruptive and innovative forces. AI refers to the development of computer systems that can perform tasks requiring human-like intelligence, including learning, reasoning, decision-making, and problem-solving (Russell et al., 2020). In marketing consumer goods, AI has moved from being a futuristic concept to becoming a critical enabler of competitive advantage in a highly digitalized and data-driven marketplace. By leveraging AI, firms are able to optimize marketing strategies, predict consumer behavior, personalize customer experiences, and streamline operations. This capacity to process vast datasets, identify complex patterns, and provide actionable insights distinguishes AI as a transformative tool in modern marketing (Chui et al., 2018; Onwubuya, Amobi & Atah, 2025).

The adoption of AI in marketing consumer goods is primarily driven by the explosion of big data and the increasing need for businesses to harness it effectively. With the growth of digital platforms, companies now have access to unprecedented volumes of consumer information, including browsing habits, purchase histories, and social media interactions. AI systems, through machine learning algorithms and predictive analytics, can analyze such datasets in real-time, providing marketers with insights that facilitate targeted campaigns and product positioning (Mayer-Schönberger et al., 2013; Olom & Atah, 2025). Advances in natural language processing (NLP) and



machine learning have further enhanced AI's role by enabling systems to interact more naturally with consumers. Tools such as chatbots, recommendation engines, and personalized advertising platforms exemplify how AI delivers tailored content and real-time engagement on a large scale (Jordan et al., 2015; Ingwe, Abang & Atah, 2025).

A particularly notable application of AI in marketing is in customer relationship management. Businesses increasingly deploy AI-powered technologies like chatbots and virtual assistants to improve communication with customers, providing round-the-clock service while reducing operational costs (Kumar et al., 2019). Virtual assistants such as Alexa, Siri, and Google Assistant are also being integrated into marketing strategies, allowing consumers to discover and purchase products through voice-activated searches. In the Nigerian context, such applications hold tremendous potential for addressing gaps in customer service delivery and expanding digital engagement across e-commerce platforms (Uju, Asuo, Chukwurah & Atah, 2024). These technologies not only enhance response times but also improve customer satisfaction by offering instant, personalized interactions (Ochui, Idike & Atah, 2024).

Beyond customer service, AI is reshaping the efficiency and accuracy of marketing operations. Predictive analytics, for instance, allows firms to forecast consumer demand, monitor product lifecycles, and adapt pricing strategies to dynamic market conditions (Davenport et al., 2018). Automation tools further extend these benefits by streamlining repetitive tasks such as email marketing, social media management, and content curation, enabling businesses to allocate human resources to more strategic and innovative functions (Brynjolfsson et al., 2016). This efficiency is particularly vital in resource-constrained markets like Nigeria, where businesses constantly seek ways to reduce costs while maximizing market impact (Regina Agor Agbogo, Uju, Atah & Idike, 2024).

Another critical application area is sentiment analysis, which leverages AI to assess consumer opinions and emotions from diverse text-based data such as product reviews, social media conversations, and feedback surveys. By understanding consumer sentiments, businesses can refine their branding strategies, strengthen reputation management, and align products with consumer expectations (Pang et al., 2008). This technology has proven especially useful in monitoring real-time public reactions to products and campaigns. For Nigerian businesses, where consumer loyalty and brand trust are major competitive advantages, sentiment analysis represents a strategic opportunity to anticipate market shifts and respond proactively (Akeke, Atah, Ushie & Ingwe, 2024; Alabi & Atah, 2024).

Despite these substantial benefits, AI adoption in marketing consumer goods faces several challenges. Globally, concerns around data privacy, ethical use of consumer information, and algorithmic bias have triggered debates about transparency and accountability in AI systems (Floridi, 2019). In Nigeria, additional barriers include inadequate technological infrastructure, high costs of implementation, and a shortage of skilled personnel to design, manage, and deploy AI systems (Agrawal et al., 2018; Atah, Akeke, Ushie, Nwannunu, Anthony, Olabisi, Nnaji, Udayi, Wonah, Aderibigbe, Anthony & Ajuluchukwu, 2023). Many small and medium-sized enterprises (SMEs), which dominate the Nigerian consumer goods market, struggle to afford the significant investments required for AI integration (Atah & Alabi, 2025). Moreover, institutional resistance to change often slows down the adoption process, as businesses and educational institutions remain attached to conventional marketing practices (Chukwurah, Ben, Atah, Wonah, Idike & Ingwe, 2023).

The Nigerian case is further complicated by infrastructural gaps such as unreliable internet connectivity, erratic power supply, and limited access to advanced digital tools. These limitations restrict the scalability of AI-powered marketing tools, particularly in rural and semi-urban areas (Atah, Idike, Godwin, Isaac, Ititim, Okpe & Ochui, 2023; Nwosu, Bessong & Atah, 2022). Additionally,



the lack of coordinated policies and institutional frameworks for AI adoption in marketing exacerbates these challenges, leaving many businesses without the guidance or support necessary for effective implementation (Bessong, Atah & Ititim, 2022).

Nevertheless, scholars and practitioners agree that AI offers transformative opportunities for marketing consumer goods in Nigeria. As e-commerce and digital platforms continue to expand, AI-driven tools such as content creation software, automated email marketing systems, and predictive analytics are poised to redefine the customer experience. These technologies will not only help Nigerian businesses remain competitive in the global market but also contribute to innovation and growth in the consumer goods sector (Atah & Alabi, 2024; Otu, Ogala, Akputu & Atah, 2024). To realize this potential, however, Nigerian businesses must address the barriers to AI adoption through strategic investment, capacity building, and policy support.

In summary, the integration of AI in marketing consumer goods represents both a necessity and an opportunity in Nigeria's rapidly evolving digital economy. While the challenges of cost, infrastructure, expertise, and institutional resistance persist, the potential benefits—ranging from enhanced customer engagement and operational efficiency to predictive insights and competitive advantage—underscore the urgency of embracing this technology (Akeke, Atah, Undie, Ajuluchukwu, Ikpi, Kolo, Eleng & Ben, 2023). The growing body of literature, both globally and locally, suggests that businesses that leverage AI effectively will be better positioned to thrive in the digital marketplace of the future (Atah & Alabi, 2025). This study therefore seeks to critically examine the adoption and utilization of AI in marketing consumer goods in Nigeria, focusing on both its prospects and the constraints that influence its effective deployment.

Problem of the study

The adoption and utilization of artificial intelligence (AI) in marketing consumer goods have transformed the global business landscape, offering significant benefits such as personalized customer experiences, data-driven decision-making, and enhanced operational efficiency. However, in Nigeria, the implementation of AI in marketing remains at a relatively nascent stage, despite the country's large and growing consumer market. Several challenges hinder the widespread adoption of AI in the marketing of consumer goods in Nigeria. One key issue is the **limited technological infrastructure** in many parts of the country, which restricts businesses from fully leveraging AI tools. Additionally, many Nigerian businesses, particularly small and medium-sized enterprises (SMEs), face **financial constraints** that make it difficult to invest in advanced AI technologies and the necessary human resources for their implementation. Another significant problem is the **lack of awareness and understanding** of AI among business owners and marketers in Nigeria. Many organizations are unfamiliar with the potential of AI and how it can be integrated into their marketing strategies. This knowledge gap creates a reluctance to adopt AI-driven marketing solutions, especially in traditional sectors where manual and conventional methods of marketing are still dominant. Moreover, **data privacy concerns and ethical considerations** are emerging as critical issues. Nigerian consumers are becoming increasingly concerned about how their data is collected, stored, and utilized, creating a barrier to the acceptance of AI technologies that rely on large volumes of personal data. This lack of consumer trust, coupled with inadequate regulatory frameworks, further complicates AI adoption in marketing. Furthermore, there is a **shortage of skilled professionals** in Nigeria with expertise in AI and data analytics. The dearth of AI talent means that even businesses willing to adopt AI may struggle to effectively implement and maintain these systems, limiting the potential impact on marketing effectiveness. Given these challenges, this study seeks to explore the factors affecting the adoption and utilization of AI in the marketing of consumer goods in Nigeria. By identifying these barriers



and understanding the level of awareness, preparedness, and the benefits AI can bring, the study aims to provide actionable insights that can help businesses in Nigeria overcome these obstacles and successfully integrate AI into their marketing strategies.

Research Questions

The following research questions guided the study:

1. What are the **Content Creation and Curation Tools** in Marketing Consumer Goods in Nigeria?
2. What are the **automated email marketing tools** for marketing consumer goods in Nigeria?

Hypotheses

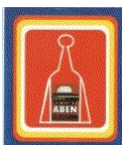
The following null hypotheses were tested at the 0.05 alpha level of significance:

1. There is no significant difference in the **content creation and curation tools** in marketing consumer goods in Nigeria based on gender.
2. There is no significant difference in the automated **email marketing tools** for marketing consumer goods in Nigeria based on gender.

Methods

The study on the adoption and utilization of artificial intelligence (AI) tools in marketing consumer goods in Nigeria employed a **descriptive survey research design**. This design was considered appropriate because it allows for the systematic collection of quantitative data from a defined population, enabling the researcher to describe existing conditions and draw meaningful inferences about the phenomenon under investigation. The **population of the study** consisted of 516 registered enterprises operating in Cross River State that are engaged in the marketing of consumer goods. These enterprises were considered relevant because they represent the business environment where AI tools could potentially influence marketing strategies, customer engagement, and sales performance. The **instrument for data collection** was a researcher-developed questionnaire titled **Adoption and Utilization of Artificial Intelligence Tools in Marketing Consumer Goods Rating Scale (AUAIMCGRS)**. The instrument was carefully designed based on the objectives of the study and a review of related literature. It consisted of structured items organized on a four-point Likert scale, ranging from **Strongly Agree (4)** to **Strongly Disagree (1)**, to capture respondents' opinions and experiences on the adoption and application of AI in their marketing practices.

To ensure **validity**, the instrument was subjected to expert review by two specialists in Business Education from the University of Calabar, who assessed the clarity, relevance, and coverage of the items in relation to the study objectives. Their input led to necessary modifications that improved the overall quality of the instrument. The **reliability** of the instrument was determined through a pilot test using the Cronbach Alpha method, which produced a coefficient of 0.87. This high reliability index indicated that the instrument was consistent and dependable for use in the main study. In terms of **data analysis**, descriptive statistics such as mean and standard deviation were employed to answer the research questions, providing insight into the central tendencies and variations in respondents' views. To test the formulated hypotheses, the independent samples t-test was used at the 0.05 level of significance. This inferential statistical technique was considered appropriate because it allowed the researcher to compare mean responses across groups and determine whether observed differences were statistically significant.

**Results of the findings***Research Question One*

What are the **Content Creation and Curation Tools** in Marketing Consumer Goods in Nigeria?

Table 1: Mean and Standard Deviation Analysis of the Content Creation and Curation Tools in Marketing Consumer Goods in Nigeria

S/N	The adoption and utilisation of the following Content Creation and Curation Tools enhancing the Marketing Consumer Goods:	\bar{X}	SD	Decision
1	Content Curation Platforms	3.80	0.57	Agree
2	Video and Image Creation Tools	3.74	0.55	Agree
3	Content Planning and Workflow Tools	3.61	0.61	Agree
4	AI-Generated Visual Content Tools	3.70	0.74	Agree
5	Email Marketing Automation Tools	3.74	0.81	Agree
	Grand Mean	3.72	0.65	Agree

Table 1 reveals that the mean scores of the items range from 3.61 to 3.80. The standard deviations range between 0.55 and 0.81, indicating that the mean scores do not vary. Furthermore, the grand mean of 3.72 indicates that the respondents are in opinion that the **adoption and utilisation of artificial intelligence tools in marketing consumer goods in Nigeria, specifically in the utilisation of** content creation and curation tools, enhance the marketing of consumer goods in Nigeria.

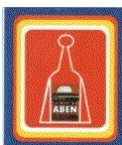
Research Question Two

What are the **automated email marketing tools** for marketing consumer goods in Nigeria?

Table 2: Mean and Standard Deviation Analysis of the What are the automated email marketing tools for marketing consumer goods in Nigeria

S/N	The adoption and utilization of the following Automated Email Marketing Tools enhancing the marketing of consumer goods	\bar{X}	SD	Decision
6	Autoresponders	3.88	0.55	Agree
7	Drip Campaigns	3.72	0.62	Agree
8	Behavior-triggered Emails	3.67	0.71	Agree
9	Event-based Emails	3.55	0.55	Agree
10	Dynamic Content Emails	3.11	0.51	Agree
	Grand Mean	3.58	0.58	Agree

Table 2 shows that the mean scores of the items range from 3.11 to 3.88. The standard deviations range between 0.51 and 0.71, revealing that the mean scores do not vary in the respondents' decisions. More so, the grand mean of 3.58 indicates that the respondents are in the opinion that the **adoption and utilization of artificial intelligence tools, specifically in the utilization of** automated email marketing tools, enhance the marketing of consumer goods in Nigeria.

**Hypotheses****Hypothesis One**

There is no significant difference in the **content creation and curation tools** in marketing consumer goods in Nigeria based on gender.

Table 3: Independent t-test analysis on the mean rating of the responses on content creation and curation tools in marketing consumer goods in Nigeria based on gender.

Items	Gender	N=516	Mean	Std.	t-cal	t-crit	Df	Decision
1	Male	309	2.86	0.55	0.51	1.71	514	Acceptance
	Female	207	3.71	0.84				
2	Male	309	3.80	0.76	0.47	1.81	514	Acceptance
	Female	207	3.92	0.77				
3	Male	207	3.81	0.61	1.25	1.87	514	Acceptance
	Female	309	3.91	0.55				
4	Male	309	3.32	0.57	1.31	1.77	514	Acceptance
	Female	207	3.41	0.58				
5	Male	207	3.45	0.53	1.51	1.86	514	Acceptance
	Female	309	3.82	0.45				
Grand mean					1.37	1.96		Acceptance

Table 3 results indicate that the calculated-t values are greater than the critical-calculated-t value of 1.37, which is less than the critical-t value of 1.96. The grand mean of 1.37 is less than the critical t value. This indicates that there is no significant difference in the content creation and curation tools in marketing consumer goods in Nigeria based on gender. The result implies that both male and female enterprises require the adoption and the utilization of AI in marketing consumer goods.

Hypothesis Two:

There is no significant difference in the automated **email marketing tools** for marketing consumer goods in Nigeria based on gender.

Table 4: Independent t-test analysis on the mean rating of the responses on automated email marketing tools for marketing consumer goods in Nigeria based on gender

Items	Institution	N=516	Mean	Std.	t-cal	t-crit	Df	Decision
6	Male	309	3.17	0.49	0.88	1.70	514	Accepted
	Female	207	3.13	0.50				
7	Male	309	3.10	0.47	0.55	1.88	514	Accepted
	Female	207	3.11	0.46				
8	Male	207	3.14	0.49	0.51	1.77	514	Accepted
	Female	309	3.13	0.50				
9	Male	309	3.19	0.48	0.50	1.49	514	Accepted
	Female	207	3.14	0.48				
10	Male	207	3.18	0.47	0.60	1.18	514	Accepted
	Female	309	3.17	0.47				
Grand Mean					0.25	1.96		Accepted

Table 4 reveals that all the items are accepted because the calculated t values are less than the critical t value of 1.96. The grand mean of 0.25 is also less than the critical t value. This indicates that there is no significant difference in the strategic management skills needed by business education students in federal and state-owned institutions for small-scale business operations.



Discussion

The results of the findings indicate that the adoption and utilization of AI tools in marketing consumer goods in Nigeria enhance the effectiveness of content creation and curation. AI enables marketers to create personalized content that resonates with their target audience, leading to improved consumer engagement and higher conversion rates. Furthermore, the findings suggest that there is no significant difference in the effectiveness of these tools based on gender, as AI tools prioritize individual preferences over broad demographic categories. This shift toward personalized marketing presents a valuable opportunity for brands in Nigeria to optimize their marketing strategies and better serve their consumers. The study, in consonance with Agrawal et al. (2018), whose findings revealed that AI tools enhance marketing efforts by improving content personalization and engagement

The findings of the hypothesis state that there is no significant difference in the content creation and curation tools in marketing consumer goods in Nigeria based on gender. This could be because both male and female consumers respond to well-curated and creatively developed content, and AI tools can be adapted to appeal to diverse gender-based preferences. AI tools help marketers generate content that appeals to individual needs, regardless of gender. The findings, in consonance with Floridi (2019), on the impact of AI tools in digital marketing found that personalization, enabled by AI, often overrides traditional gender-based segmentation. In agreement with Kumar et al. (2019), modern content creation and curation tools analyze data from user behavior, such as browsing history, previous purchases, and social media activity, to tailor content specifically to the individual. This shift toward personalization diminishes the need for gender-based content strategies. In practice, AI tools focus more on individual preferences than on broad categories like gender, which aligns with the notion that there may not be a significant difference in how content creation and curation tools are utilized for marketing consumer goods across genders.

The results of the second research question indicate that respondents largely agree that the adoption and utilization of artificial intelligence (AI) tools, particularly automated email marketing tools, significantly enhance the marketing of consumer goods in Nigeria. Furthermore, the findings suggest that there is no significant difference in the effectiveness or utilization of these tools based on gender. This could be that automated email marketing, powered by AI, has revolutionized how businesses communicate with consumers, particularly in Nigeria's evolving digital landscape.

Respondents believe that AI-powered email marketing tools, such as Mailchimp, HubSpot, and SendinBlue, have enabled brands to improve their marketing efforts by providing personalized and targeted communications at scale. These tools use AI algorithms to segment audiences, personalize messages, and optimize send times, ensuring that emails are both relevant and timely.

The findings are in agreement with Murphy (2021), whose findings reveal that the effectiveness of automated email marketing is especially notable in its ability to enhance customer engagement and conversion. AI tools analyze consumer behavior—such as past purchase history, browsing activity, and interaction with previous emails—to tailor content to each individual's needs and preferences. This level of personalization creates more relevant marketing messages that resonate with the consumer, improving open rates, click-through rates, and overall customer satisfaction. Studies have shown that personalized emails generate six times higher transaction rates than non-personalized emails, a statistic that aligns with the respondents' belief in the effectiveness of these AI tools. Chaffey (2020) opined that in Nigeria's consumer goods market, where the competition is fierce and brands need to stand out, AI-driven email marketing offers a way for companies to maintain regular and meaningful communication with their customers. Whether marketing beauty products, electronics, or household items, brands can use automated



email marketing to inform customers about new products, offer promotions, or simply maintain customer loyalty by sending personalized recommendations. Respondents believe that this technology has become an integral part of marketing strategies, leading to enhanced business outcomes.

Recommendations

Based on the findings from the study, the following recommendations are made to enhance marketing strategies for consumer goods brands in the Nigerian market:

1. The brands should continue to adopt AI-driven content creation and curation tools to streamline and enhance their marketing efforts. By leveraging AI capabilities to analyze consumer preferences and behavior, brands can create and curate content that resonates with their target audience, leading to higher engagement and conversion rates.
2. **The enterprises should utilize automated email marketing tools for enhanced customer engagement.** By focusing on individual consumer needs rather than traditional demographic factors like gender, brands can create highly targeted email campaigns that improve customer engagement, increase sales, and foster long-term loyalty.

Conclusion

The adoption and utilization of artificial intelligence (AI) tools in marketing consumer goods in Nigeria present a significant opportunity for businesses to enhance their operational efficiency, optimize customer engagement, and improve overall marketing outcomes. Despite challenges such as limited technological infrastructure, financial constraints, and a lack of awareness, AI has the potential to revolutionize the Nigerian consumer goods sector by enabling personalized marketing, predictive analytics, and streamlined customer service. As global trends indicate, AI-driven marketing strategies can empower businesses to better understand consumer behavior, target specific market segments with precision, and ultimately drive higher sales and customer satisfaction. In Nigeria, the gradual integration of AI in marketing can help companies overcome traditional limitations, offering a competitive edge in an increasingly digital economy. However, for AI adoption to become widespread, there must be greater investment in technology infrastructure, training of skilled professionals, and education on the potential benefits of AI for businesses of all sizes. The adoption and utilization of AI tools in marketing consumer goods in Nigeria hold transformative potential for businesses. By embracing AI, companies can improve their marketing effectiveness, engage customers more meaningfully, and position themselves for long-term success in an increasingly competitive market. However, this transition requires overcoming several challenges, including technological limitations, skill shortages, and regulatory concerns. Through strategic investments and an open-minded approach to innovation, Nigerian businesses can harness the power of AI to drive growth and improve their market positioning.

References

- Agor, R. A., Uju, N. O., Atah, C. A., & Idike, I. M. (2024). Digital-based learning and the sustainability of business education programmes among College of Education lecturers in Cross River State. *Journal of International Cooperation and Development*, 7(20), 67–78. <https://doi.org/10.36941/jicd-2024-0008>
- Agrawal, A., Gans, J. S., & Goldfarb, A. (2018). *Prediction machines: The simple economics of artificial intelligence*. Harvard Business Review Press.



- Akeke, M. N. G., Atah, C. A., Ushie, P. U., & Ingwe, M. O. (2024). Utilization of online tools and business education lecturers' job productivity in Cross River State. *Association of Business Educators of Nigeria Journal*, 11(2), 398–408.
- Akeke, M. N. G., Atah, C. A., Undie, S. P., Ajuluchukwu, N. E., Ikpi, I. O., Kolo, I., Eleng, E., & Ben, A. O. (2023). Electronic infrastructure and the sustainable development of business education programmes in the 21st century. *Academic Journal of Interdisciplinary Studies*, 12(5), 321. <https://doi.org/10.36941/ajis-2023-0147>
- Alabi, E. B., & Atah, C. A. (2024). The role of artificial intelligence in enhancing content delivery in business education: A 21st-century approach. *Journal of Association of Vocational and Technical Educators of Nigeria*, 29(3), 267–277.
- Atah, C. A., & Alabi, E. B. (2024). Digital-based learning and the sustainability of office technology and management education (OTM) among tertiary institutions lecturers in Bayelsa State. *Journal of Business and African Economy*, 10(1), 73–83. <https://doi.org/10.56201/jbae.v10.no1.Jan.2024.pg73.83>
- Atah, C. A., & Alabi, E. B. (2025a). Assessing the preparedness of business education graduates for success in a digitally driven economy in the 21st century. *International Journal of Economics and Business Management*, 11(3), 267–277. <https://doi.org/10.56201/ijebm.vol.11.no3.2025.pg267.277>
- Atah, C. A., & Alabi, E. B. (2025b). Virtual reality (VR) in office technology and management training for business education students in Nigeria. *International Journal of Education and Development*. University of Uyo.
- Atah, C. A., Akeke, N. G. M., Ushie, G. B., Nwannunu, B. I., Anthony, G., Olabisi, B. C., Nnaji, E. S., Udayi, E. A. A. O., Wonah, F. A., Aderibigbe, S. A., Anthony, O. B., & Ajuluchukwu, E. N. (2023). Analysis of e-learning platform utilization and business education curriculum content delivery in Rivers State Universities (RSU), Nigeria. *Journal of Innovation*, 74(5), 1476–1491. <https://journal-innovations.com/>
- Atah, C. A., Idike, I. M., Godwin, R. Y., Isaac, K., Ititim, D. U., Okpe, O. M., & Ochui, M. O. (2023). Modern e-technologies and academic staff job productivity in Nigerian Colleges of Education. *Mediterranean Journal of Social Sciences*, 14(4), 51–60. <https://doi.org/10.36941/mjss-2023-0024>
- Atah, C. A., Akeke, M. N. G., Ajuluchukwu, E. N., Aderibigbe, S. A., Wonah, F. A., Udayi, E. A. O., Nwannunu, B., Olabisi, B. C., Anthony, G. B., Ititim, D. U., Godwin, B. U., Nnaji, E. S., Ben, A. O., & Ogbeche, M. M. (2023). Digitalization of business education curriculum for the 21st century for global relevance in Nigeria. *Journal of Innovation*, 74(5), 1457–1466. <https://journal-innovations.com/>
- Bessong, E. B., Atah, C. A., & Ititim, D. U. (2022). Extent of ICT and office management among bursary staff in universities in Cross River State. *Developing Economy Journal*, 1(8), 1–6. <https://cirdjournal.com/index.php/dej/issue/view/230>
- Brynjolfsson, E., & McElheran, K. (2016). The digitization of business and its implications for productivity growth. *National Bureau of Economic Research Working Paper Series*.
- Chaffey, D. (2020). Email marketing trends 2020. *Smart Insights*.
- Chui, M., Manyika, J., & Miremadi, M. (2018). What AI can and can't do (yet) for your business. *McKinsey Quarterly*.
- Chukwurah, M. U., Ben, A. O., Atah, C. A., Wonah, F. A., Idike, I. M., & Ingwe, M. O. (2023). Digital skills required for the sustainability of small-scale businesses in Nigeria. *Mediterranean Journal of Social Sciences*, 14(6), 67–77. <https://doi.org/10.36941/mjss-2023-0037>



- Davenport, T. H., & Ronanki, R. (2018). Artificial intelligence for the real world. *Harvard Business Review*.
- Floridi, L. (2019). The ethics of artificial intelligence. In *The Oxford handbook of ethics of AI*. Oxford University Press.
- Ingwe, M. O., Abang, M. B., & Atah, C. A. (2025). Leveraging virtual reality technology for innovative business education in Nigerian higher institutions. *KIU Journal of Education*, 5(1), 167–171.
- Jordan, M. I., & Mitchell, T. M. (2015). Machine learning: Trends, perspectives, and prospects. *Science*, 349(6245), 255–260.
- Kotler, P., & Keller, K. L. (2016). *Marketing management* (15th ed.). Pearson.
- Kumar, A., & Rajan, C. (2019). The role of artificial intelligence in enhancing customer experience. *Journal of Business Research*, 98, 225–234.
- Luger, E., & Sellen, A. (2016). Like having a really bad PA: The gulf between user expectations and AI assistants. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems* (pp. 5286–5297).
- Mayer-Schönberger, V., & Cukier, K. (2013). *Big data: A revolution that will transform how we live, work, and think*. Houghton Mifflin Harcourt.
- Murphy, C. (2021). The best email marketing software for 2021. *PCMag*.
- Nwogugu, E. (2021). Artificial intelligence in Nigerian marketing: Opportunities and challenges. *Nigerian Journal of Marketing*, 12(1), 15–30.
- Nwosu, B., Bessong, E. B., & Atah, C. A. (2022). Availability and utilization of Zoom technologies in teaching and learning of business education in tertiary institutions in Cross River State. *Academic Journal of Current Research*, 9(10), 152–161. <https://cirdjournal.com/index.php/ajcr/article/view/956>
- Ochui, M. O., Idike, I. M., & Atah, C. A. (2024). Electronic learning and academic performance of business education students in University of Calabar. *Journal of Association of Business Educators of Nigeria*, 11(1), 334–340.
- Olom, P., & Atah, C. A. (2025). Utilization of artificial intelligence on instructional preparation by business educators in Cross River State. *Mediterranean Journal of Social Sciences*, 16(1), 92–102. <https://doi.org/10.36941/mjss-2025-0008>
- Onwubuya, U. N., Amobi, C. M., & Atah, C. A. (2025). Integration of machine learning as correlate of Core Curriculum and Minimum Academic Standards (CCMAS) implementation for business education in South-East Nigeria. *Journal of International Cooperation and Development*, 8(1), 29–38. <https://doi.org/10.36941/jicd-2025-0003>
- Otu, F. E., Ogala, C. S., Akputu, M. O., & Atah, C. A. (2024). Utilization of AI tools in the content delivery of CCMAS in Nigerian universities. *International Journal of Education and Evaluation*, 10(5), 367–378.
- Pang, B., & Lee, L. (2008). Sentiment analysis and opinion mining. *Foundations and Trends in Information Retrieval*, 2(1), 1–135.
- Russell, S. J., & Norvig, P. (2020). *Artificial intelligence: A modern approach*. Pearson.
- Uju, O. N., Asuo, H. V., Chukwurah, M. U., & Atah, C. A. (2024). Adoption and utilization of digital skills for maximum productivity among university graduates in Nigeria. *World Journal of Innovation and Modern Technology*, 8(4), 96–107.