



AWARENESS AND USE OF AI MARKETING TOOLS AMONG UNDERGRADUATE ENTREPRENEURS IN ANAMBRA STATE

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ABSTRACT

Artificial intelligence (AI) is rapidly evolving and impacting various professional domains, including marketing. This study, therefore, investigated awareness and adoption of AI tools for marketing purposes among undergraduate entrepreneurs in Anambra State. A quantitative descriptive research design was employed. The study population was undergraduates in Anambra State. A questionnaire was used to collect data from 300 respondents selected through the multi-stage approach. Data were analyzed using descriptive statistics. Results indicated high awareness of AI marketing tools among the respondents. Extent of awareness, however, differed across tools, with video/chatbot tools recording higher awareness than influencer identification tools. Despite high awareness levels, use of AI tools was found to be moderate, occurring among 40-50% of respondents. Image generator tools recorded the highest usage (55.3%), followed by video creation tools (50.7%), content generator tools (50.0%), chatbots and social media advertising bots (48.7% each), whereas web analytics tools (41.3%) and influencer identification tools (21.3%) recorded substantially lower adoption. Respondents perceived AI tools as enhancing important marketing objectives such as reach and productivity. Cost and lack of training were the major barriers to adoption. The study concluded that AI has the potential to transform undergraduate entrepreneurship, but its benefits will not be optimised unless the ecosystem supporting student entrepreneurs addresses the capability and resource constraints that hinder sustained adoption. The researchers recommended, among others, the provision of affordable access to AI tools, practical training, mentorship, and digital skills development to bridge knowledge gaps and promote sustained utilisation.

Keywords: Artificial intelligence, marketing tools, undergraduates, entrepreneurs, awareness, use

Introduction

Information and communication technology has undergone a rapid growth in recent decades and profoundly affecting how everything is done. This includes how businesses work and showcase their products and services to people (Ataide, 2024). The development of artificial intelligence (AI) has been a crucial phase in the evolution of the digital technology with many industries



today embracing AI to ease their operations and make them more efficient (Espina-Romero, Sánchez, Gutiérrez, Conde, Castro, Cajo & Corredoira, 2023).

One of such areas of where AI is being adopted is marketing (Labib, 2024). Marketing helps businesses succeed. It helps new and old commercial entities get known and attract customers (Choudhury, 2022). The integration of Artificial Intelligence (AI) in marketing has significantly transformed how businesses understand, engage with, and influence consumers (Kumar, Ashraf & Nadeem, 2024). According to Labib (2024), AI-driven technologies, including machine learning, natural language processing, and predictive analytics, enable marketers to harness large volumes of data to generate actionable insights. These capabilities have shifted marketing from reactive to proactive strategies, enhancing personalization and customer targeting. For instance, AI algorithms can segment audiences based on behavioural patterns and predict purchasing intent, allowing for more effective and timely content delivery.

Moreover, AI enhances customer interactions through tools such as chatbots and virtual assistants, which provide real-time responses and 24/7 service. This automation not only reduces operational costs but also improves user experience. Furthermore, AI is used in dynamic pricing, programmatic advertising, and sentiment analysis, providing marketers with agility in rapidly changing environments (Kumar et al., 2024; Labib, 2024).

Marketers today leverage a range of AI tools to optimize customer experiences and campaign performance. For instance, Salesforce Einstein uses machine learning to deliver predictive analytics, allowing businesses to anticipate customer behaviour and tailor messaging accordingly. Similarly, HubSpot's AI-powered CRM assists in lead scoring and automating personalized email content, streamlining customer relationship management (Verma, Sharma, Deb & Maitra, 2021).

Another prominent example is ChatGPT, which marketers use for content generation, customer service chatbots, and social media engagement (Wilendra, Nadlifatin & Kusumawulan, 2024). Tools like Persado and Copy.ai use natural language processing to craft emotionally resonant marketing copy, while Hootsuite Insights, powered by Brandwatch, applies AI to monitor social sentiment and brand reputation across digital platforms. Additionally, Google Ads' Smart Bidding uses AI to optimize ad spend by automatically adjusting bids in real time based on likelihood of conversion (Labib, 2024).

These tools not only improve operational efficiency but also empower marketers to create personalized experiences. However, challenges such as data privacy, algorithmic bias, and over-reliance on automation are a significant concern in AI-assisted marketing given the risk they represent (Labib, 2024).

Young people everywhere are seen as often the more tech-savvy group (Broos 2005 as cited in Onjewu, Godwin, Azizsafaei, & Appiah, 2024). Thus, it is important to consider how AI-assisted marketing may be influencing business activities among youths. Tertiary institution environments are a typical domain where large concentrations of young entrepreneurs can be



found in Nigeria, as many students venture into business activities either due to present economic exigencies or in pursuit of a dream business career (Eneyo & Eneyo, 2021).

Many students start small businesses to earn income on the side while attending school. Popular among such student enterprises include food and beverage production and sales, clothe making, body beauty services, and sale of all kinds of goods. Tech-based businesses are also common, with undergraduates offering services like website design, graphic design, video production etc. (Nwachukwu, Obisanma, Kuromiema, Maurice & Obatola, 2021).

No doubt, embracing AI marketing tools could assist these young entrepreneurs in optimising their business potentials. This is especially against the backdrop of the reality that most of them are into small-scale sole entrepreneurship and lack the financial and logistical strength to optimize traditional marketing practices (Okolie, 2024). The increasing penetration of smartphone and the Internet among the nation's population potentially fosters the possibility of adoption of such digital tools by the student entrepreneurs. It was against this backdrop that this study evaluated knowledge and adoption of AI tools for marketing purposes among undergraduate entrepreneurs in Anambra State.

Statement of the Problem

Student entrepreneurship has become a common phenomenon on tertiary institutions campuses across Nigeria (Eneyo & Eneyo, 2021). This is to be considered a positive development given the high rate of unemployment in the country which makes such job-creating endeavours critical for individual and society (Afolabi, 2018). However, in most cases, these enterprises are small startups that do not have the human resources, financial, and logistical muscle to hold their own in the sphere of traditional marketing (Okolie, 2024), making alternative online-based marketing strategies essential for these businesses. Among these strategies is the use of AI marketing tools for business promotion.

Nonetheless, while technology obviously presents valuable opportunities for student entrepreneurs, there are challenges that potentially limit optimization of these resources. Such would include lack of awareness, skill deficit, and poor access to digital tools (Sadiq, Hack-Polay, Fuller & Rahman, 2022). As Nwachukwu, Ibe and Obiora (2021) found among student entrepreneurs in Anambra state, juggling schoolwork and business leaves little time for extensive training in tools that could help young businesses succeed. In the same vein, studies have revealed a lack of quality entrepreneurship education in many secondary schools in Nigeria, meaning that students are likely to enter tertiary school without basic business skills (Okeke et al., 2020). Thus, students are left to mainly learn on their own through informal networks (Nwachukwu, Nnamani & Okafor, 2021).

Cultural factors also influence acceptance of new digital technologies. In societies, such as Africa, where community goals come first, an individual's attempt to try out untested ideas may face social pushbacks unless where the expected benefits are clear (Amatucci & Swartz, 2011). All this highlights the need for a study to probe the current knowledge levels and adoption of AI



marketing technologies among student entrepreneurs. Existing literature reveals a seeming paucity of studies focusing on university students in Anambra state, Southeast Nigeria.

Objectives of Study

The general objective of this study was to find out the awareness and use of AI marketing tools among undergraduate entrepreneurs in Anambra State. The specific objectives were as follows:

1. To find out the level of awareness of AI marketing tools among undergraduate entrepreneurs in Anambra State.
2. To evaluate the extent of use of AI marketing tools among undergraduate entrepreneurs in Anambra State.
3. To ascertain the specific AI marketing tools used by the undergraduate entrepreneurs.
4. To assess the extent AI tools helped the undergraduate entrepreneurs realize their marketing objectives.
5. To establish factors that influenced use of AI marketing tools used by the undergraduate entrepreneurs in Anambra state.

Literature Review

Artificial intelligence (AI) has come a long way since its beginnings (Bhat, 2025). In the early 1950s, scientists like Alan Turing first explored the idea of creating machines that could “think” (Turing, 1950). Over the subsequent decades, incremental progress was made as researchers developed programmes that could play games, solve puzzles and perform simple logical reasoning. Advancements accelerated in the late 20th century with the emergence of powerful computers and vast leaps in processing capabilities. Neural networks, loosely modeled after the human brain, gained popularity as a means of enabling machines to learn from large datasets (Bhat, 2025).

The advent of the Internet was crucial to the evolution of AI, as the online space provided huge amounts of facts to learn from. New “deep learning” allowed machines see patterns hidden inside unlabeled data all by themselves (LeCun, Bengio, & Hinton, 2015). Amazing creations came from this, including mobile assistants like Siri, self-driving cars, face recognition, and automatic translating between languages (Goodfellow, Bengio & Courville, 2016). Now AI is being applied to improve many jobs in fields like healthcare, transport, education and more (Espina-Romero et al., 2023).

AI plays a major role in the lives of young people today and while it was initially developed by researchers, its applications have, over the past decade, spread widely in education (Moustapha & Yusuf, 2023) and business (Ononokpono, Osademe & Olasupo, 2023; Ukpog, Udoh, & Essien, 2019). Many students are now accustomed to AI-powered tools from an early age (Moubouti, 2023). Intelligent tutoring systems help teach basic subjects, while educational chatbots and videos delivered by AI provide expanded learning options (Holmes et al., 2019; Zawacki-Richter, Marín, Bond, & Gouverneur, 2019). University curricula also increasingly integrate digital skills and topics surrounding AI's real-world impacts (Collins, Dennehy, Conboy, & Mikalef, 2021). As a result, undergraduates entering the workforce are likely to more



conversant with concepts like machine learning and how smart technologies can transform various industries.

Today AI is increasingly being applied to marketing including for analysing consumer behaviour, implementing personalized marketing, and the optimizing data-driven marketing decisions generally (Nwankwo & Abude, 2024). Recent studies conducted in Nigeria show that AI marketing tools are enhancing business success (Bassey, Brownson & Efi, 2025; Ewanlen & Asaolu, 2023).

Undergraduate business owners are thus presented with an opportunity to adopt such technology to advance their enterprise. Prior studies have discovered that undergraduate startup founders are generally optimistic and yet cautious regarding AI implementation into their businesses (Yan, Vakharia, Yang & Zhang, 2021). Many AI tools automate routine tasks, freeing time for other priorities these students face (Santos-Jaén, León-Gómez, Martínez, & Muñoz, 2025). Chatbots answer queries, predictive algorithms suggest best content or ad targeting areas, and analytics uncover usage patterns – all with minimal oversight. However, setup and optimization requires know-how which some undergraduates haven't gained yet due to prioritizing studies over hands-on experience (Ramesh & Chawla, 2022; Arsenijevic & Jovic, 2019).

Exposure to AI tools likely varies depending on university support. Programmes emphasizing tech entrepreneurship create experiential ecosystems letting youth test AI applications (Heidenreich, Spieth & Pfeifer, 2021). Prior studies indicate that while undergraduates recognize AI's time-saving appeal, implementation hurdles curb enthusiasm (Ramesh & Chawla, 2022).

Costs, technical difficulty, and lack of usage examples tailored to student contexts dissuade early adoption (Khalkhali, Zavareh, Khalkhali & Abolhasani, 2021). Additionally, short-term business horizons due to impending graduation potentially lessen motivations to invest AI setup time against uncertain long-run profits. Still, opportunities exist (Khalkhali et al., 2021).

However, full adoption of AI strategies requires funds and technical skills which not all student entrepreneurs may possess from the start (Khalkhali et al., 2021). Time pressure has also been found to hamper learning of AI skills as students struggle to share their time between studies and business (Nwachukwu et al., 2021). Unfamiliarity with AI capabilities and interfaces could initially slow down marketing integration compared to veteran entrepreneurs and over-reliance on automated systems without human touch points also risks losing customer understanding and goodwill over time (Masod, 2026).

Instructively, while there appears to be a dearth of studies on adoption of AI marketing tools among students in Nigeria, studies on its adoption by businesses generally in the country (such as Adeyinka, Chiharidzo & Adeyinka, 2024; Ewanlen & Asaolu, 2023) have shown that some of the above factors found to have hampered adoption among students' entrepreneurs in foreign countries have also hindered AI adoption among businesses in Nigeria. Very importantly, factors related to infrastructure availability and cost also affect AI adoption for marketing among businesses in Nigeria (Adeyinka et al., 2024).



It will therefore be interesting to see how these dynamics that have defined adoption of AI in the Nigeria's general business environment reflect among undergraduate entrepreneurs. This is pertinent given that not much appears to have been done by researchers in this area.

Theoretical Framework

To place this study in a proper theoretical framework, the Diffusion of Innovations Theory was chosen. This theory was propounded by Everett Rogers in 1962, and it provides an apt framework for understanding awareness and use of AI marketing tools among undergraduate entrepreneurs. The theory examines how new ideas and technologies spread through populations over time (Rogers, 2003). Rogers identified a process of diffusion occurring in five stages – knowledge, persuasion, decision, implementation, and confirmation. Knowledge involves exposure and comprehending an innovation. Persuasion leads to forming favourable or unfavourable attitudes. At decision, an individual opts to adopt or reject. Implementation puts the innovation to use, and confirmation sees reinforcement of the choice (Rogers, 2003). This staged process may align well with growing awareness and potential AI adoption cycles. Rogers identified three main elements impacting innovation diffusion rates – the innovation itself, communication channels promoting it, and social systems norms, while arguing further that diffusion may be influenced by various operating at multiple levels – individual traits, system structures, and innovation attributes (Rogers, 2003).

Crucial to adoption of an innovation are five perceived attributes: relative advantage, compatibility, complexity, trialability, and observability. Thus, adoption may happen when students perceive AI tools as significantly improving marketing efficiency and outcomes (relative advantage) and if the tools align with their existing values, digital skills, and business practices (compatibility). They may, however, fail to adopt the technology if the tools are perceived as too technical or difficult to learn (complexity). Nonetheless, adoption is likely to occur if the tools are perceived as allowing users to experiment with the tools (trialability) and observe successful outcomes among their peers (observability).

Diffusion theory further categorizes adopters into innovators, early adopters, early majority, late majority, and laggards based on their willingness to try innovations. Whereas innovators eagerly pursue new technologies, other groups adopt more gradually depending on risk tolerance (Rogers, 2003). In this context, a few tech-savvy students may serve as innovators and early adopters, actively exploring AI tools, while others adopt them only after peer validation or institutional encouragement.

Methodology

This study adopted the survey method. Area of the study was Anambra state, South-East geopolitical zone of Nigeria. As at the time of this research, the state had nine officially accredited universities as follows: Nnamdi Azikiwe University, Awka; Chukwuemeka Odumegwu Ojukwu University, Igbariam, Madonna University, Okija, Paul University, Awka, Tansian University, Umuaya, Legacy University, Okija, Peter university Onneh, Shanahan University, Onitsha. and University on the Niger, Onitsha. The first institution is owned by the



Federal government, the second by Anambra State government while the last seven are privately owned.

The study population was undergraduate entrepreneurs in the universities in Anambra state. This was an indefinite population being that no official record could be found by the researchers on the number of such undergraduate entrepreneurs. A sample of 300 was arrived at based on the parameters suggested by Comrey and Lee (1992). Multistage sampling procedure was adopted which involved, at the first stage, selection of three universities (Nnamdi Azikiwe University, Awka, Chukwuemeka Odumegwu Ojukwu University, Igbariam, and Madonna University, Okija. The first two were purposively selected as the only federal and state government-owned universities respectively, while the last was randomly picked from among the seven private universities. Furthermore, two faculties were randomly selected from each of the three universities (2nd stage), while two departments were randomly chosen from each department (3rd stage). The fourth stage saw selection of respondents from each of the departments chosen. The selection was purposively done as the researchers chose only students that were involved in entrepreneurship. The sample was proportionately distributed among the three universities thus: Nnamdi Azikiwe University (189 respondents), Chukwuemeka Odumegwu Ojukwu University (81 respondents), and Madonna University (30 respondents).

A pre-tested close-ended questionnaire was used to collect primary data. The questionnaire was self-administered. Data analysis was done using frequencies and simple percentages

Results and Discussion

Demographic Data

A total of 300 copies of the questionnaire were physically distributed to undergraduate students from Nnamdi Azikiwe University and Anambra State University who identified as entrepreneurs. A response rate of 100% was achieved as the researcher was able to recover the entire copies. Gender distribution show that majority (60.7%) of respondents were female. Most respondents (59.3%) were between ages 20 and 24, representing the typical undergraduate cohort. Awareness and adaptation of new technologies may be highest during these early adult years still spent in formal education.

Awareness of AI Marketing Tools

The findings reveal a high level of awareness of AI marketing tools among undergraduate entrepreneurs, with 80.7% of respondents reporting that they were very aware of these technologies, while only 2.7% indicated no awareness. This high level of awareness suggests that AI marketing tools have become increasingly visible within the undergraduate entrepreneurial ecosystem. This pattern reflects the growing integration of artificial intelligence into education and business, as the literature indicates that AI has evolved from a specialised research field into a mainstream technology influencing multiple sectors, including marketing (Espina-Romero et al., 2023). The increasing exposure of students to AI-powered technologies through educational platforms (Moustapha & Yusuf, 2023; Moubouti, 2023) and the incorporation of AI-related digital competencies into university curricula (Collins et al., 2021) have likely contributed to this widespread awareness. Similarly, the application of AI in marketing for consumer analysis,



personalised marketing, and data-driven decision-making (Nwankwo & Abude, 2024), alongside evidence that AI is improving business performance in Nigeria (Ewanlen & Asaolu, 2023; Bassey et al., 2025), may have further increased students' awareness of these technologies.

Although awareness was generally high, respondents demonstrated varying levels of familiarity with specific AI marketing tools. Video creation tools (65.3%), chatbots (61.3%), image generator tools (60.0%), social media advertising bots (56.7%), and content generator tools (56.0%) recorded the highest familiarity levels. This finding corresponds with the observations of Santos-Jaén et al. (2025), who argued that undergraduate entrepreneurs are more likely to embrace AI applications that automate routine marketing activities and reduce the time required to manage business operations. Since many student-owned businesses depend heavily on social media promotion, it is unsurprising that respondents were more familiar with AI tools designed for creating visual content, generating marketing messages, and interacting with customers. These findings also reinforce the argument by Nwankwo and Abude (2024) that AI is increasingly being applied to content creation, customer engagement, and personalised marketing, which makes these applications more visible and relevant to emerging entrepreneurs.

In contrast, familiarity with web analytic tools (39.3%) and influencer identification tools (36.0%) was considerably lower, with influencer identification tools recording the highest proportion of respondents who were not familiar with them (44.0%), followed by web analytic tools (30.0%). This finding agrees with previous studies which suggest that although undergraduate entrepreneurs appreciate the benefits of AI, they often lack the technical expertise and practical experience required to utilise more sophisticated AI applications (Arsenijevic & Jovic, 2019; Ramesh & Chawla, 2022). Khalkhali et al. (2021) similarly argued that technical complexity, limited skills, and inadequate exposure constrain the adoption of advanced AI technologies. These explanations are particularly relevant because web analytics and influencer identification tools generally require greater analytical competence than content generation or chatbot applications, making them less accessible to many undergraduate entrepreneurs.

The findings are also instructive within the context of the Diffusion of Innovations Theory, particularly Rogers' (2003) proposition that awareness or knowledge constitutes the first stage in the innovation adoption process. The high awareness observed in this study suggests that most undergraduate entrepreneurs have successfully reached the knowledge stage of AI adoption, which places them as potential adopters. Furthermore, the higher familiarity with content creation tools, chatbots, and image generators echoes Rogers' assertion that innovations perceived as offering clear relative advantages, greater compatibility with users' existing practices, lower complexity, and visible benefits diffuse more rapidly than those perceived as technically demanding. Conversely, the comparatively lower familiarity with web analytics and influencer identification tools suggests that their greater complexity and lower observability have slowed their diffusion among undergraduate entrepreneurs.

Use of AI Marketing Tools



The findings indicate a moderate level of AI marketing tool adoption among undergraduate entrepreneurs. This suggests that awareness has translated into use, albeit unevenly across different categories of AI applications. Image generator tools recorded the highest usage (55.3%), followed by video creation tools (50.7%), content generator tools (50.0%), chatbots and social media advertising bots (48.7% each), whereas web analytics tools (41.3%) and influencer identification tools (21.3%) recorded substantially lower adoption. This pattern suggests that respondents favour AI tools that produce immediate and visible outputs, particularly those that facilitate content creation and social media promotion, over analytical tools whose benefits are more strategic and long term. This finding extends the observations of Nwankwo and Abude (2024) that AI is increasingly employed for content generation, customer engagement and personalised marketing. It also lends empirical support to the argument by Santos-Jaén et al. (2021) that student entrepreneurs are attracted to AI applications that automate routine tasks and reduce the burden of balancing academic and business responsibilities. At the same time, the limited use of web analytics and influencer identification tools reinforces the argument of Ramesh and Chawla (2022), Arsenijevic and Jovic (2019), and Khalkhali et al. (2021) that advanced AI applications demand greater technical competence and marketing knowledge, which many undergraduate entrepreneurs have not yet acquired. The findings therefore suggest that AI adoption among student entrepreneurs is driven less by the sophistication of the technology than by its perceived practicality, ease of use, and immediate value for day-to-day business operations.

Although adoption of some AI marketing tools was relatively encouraging, the findings show that their use has not yet become routine. Only 5.3% of respondents reported using AI tools very frequently and 12.0% frequently, while the majority used them only occasionally (33.3%), rarely (22.7%), or very rarely (25.3%). This disparity between adoption and regular use suggests that many undergraduate entrepreneurs experiment with AI technologies without fully integrating them into their marketing activities. Such a pattern resonates with the finding by Nwachukwu et al. (2021) that students' academic commitments often restrict the time available to develop and consistently apply digital business skills. Similarly, Khalkhali et al. (2021) argued that financial constraints, limited infrastructure, and inadequate technical competence discourage sustained AI utilisation even after initial adoption. Beyond these structural constraints, the findings may also imply that respondents perceive AI primarily as a supplementary rather than indispensable marketing resource, relying on it when convenient rather than embedding it into their everyday business processes.

Furthermore, findings provide a nuanced validation of the Diffusion of Innovations Theory (Rogers, 2003). While the relatively high adoption of content-focused AI tools indicates that many respondents have progressed beyond the knowledge and persuasion stages into implementation, the low frequency of use suggests that only a minority have reached the confirmation stage where continued use becomes habitual. Also, the uneven adoption across AI tool categories reflects Rogers' innovation attributes. Applications such as image generators, video creators and chatbots possess high relative advantage, compatibility with students' digital marketing practices, "trialability" through free or low-cost versions, and strong observability because their outcomes are immediately visible on social media. In contrast, web analytics and



influencer identification tools are more complex, require greater technical interpretation, and produce less immediately observable outcomes; qualities that slow their diffusion among undergraduate entrepreneurs.

Perceived Effectiveness of AI Marketing Tools

The findings reveal overwhelmingly positive perceptions of the effectiveness of AI marketing tools among undergraduate entrepreneurs who use them. A substantial majority (81.4%) agreed or strongly agreed that AI tools enable them to reach and engage their target audience more effectively, while only about 5% expressed disagreement. Similarly, 80.7% agreed that AI makes marketing easier, suggesting that respondents perceive AI not merely as a technological innovation but as a practical solution for improving marketing performance. These findings agree with the growing body of literature that identifies AI as a transformative marketing technology capable of enhancing customer engagement, personalising communication, and supporting data-driven marketing decisions (Nwankwo & Abude, 2024). They also corroborate studies conducted in Nigeria by Ewanlen and Asaolu (2023) and Bassey, Brownson and Efi (2025), which found that AI adoption contributes positively to business performance by improving marketing effectiveness and operational efficiency. For undergraduate entrepreneurs who often operate with limited financial and human resources, the ability of AI to simplify marketing activities is consistent with the argument of Santos-Jaén et al. (2021) that AI automates routine tasks thus allowing students to devote more attention to other academic and business responsibilities.

Respondents also viewed AI as enhancing the quality and attractiveness of their marketing activities. About 76.7% of users agreed that AI makes marketing more engaging, whereas only 8.0% disagreed. This suggests that undergraduate entrepreneurs associate AI with creativity, innovation, and improved audience interaction, particularly through tools that generate compelling visual and textual content. Such perceptions align with the increasing use of AI for content creation and personalised marketing (Nwankwo & Abude, 2024) and support the optimism reported by Yan et al. (2021) that student entrepreneurs generally perceive AI as an opportunity to strengthen their businesses despite recognising implementation challenges. The findings therefore indicate that respondents value AI not only for improving operational efficiency but also for enhancing the appeal and competitiveness of their marketing communication.

However, respondents expressed comparatively less certainty regarding AI's financial benefits. Although 56.0% agreed that AI makes marketing more cost-effective, a sizeable 28.7% remained undecided, while 15.3% disagreed. This suggests that although respondents acknowledge AI's functional advantages, they are less convinced that these benefits automatically translate into reduced marketing costs. This finding reflects the caution reported by Ramesh and Chawla (2022), who observed that undergraduate entrepreneurs often recognise AI's potential but remain uncertain about the costs associated with implementation and optimisation. It also resonates with Khalkhali et al. (2021) and Adeyinka, Chiwaridzo and Adeyinka (2024), who identified financial constraints, infrastructure limitations, and the cost of acquiring AI capabilities as persistent barriers to AI adoption, particularly in developing economies. Consequently, respondents may



perceive AI as effective without necessarily viewing it as an immediately cost-saving investment.

The findings strongly support the Diffusion of Innovations Theory, particularly the proposition that the perceived attributes of an innovation shape its adoption and continued use (Rogers, 2003). The overwhelmingly positive evaluations of AI's ability to improve audience engagement, simplify marketing, and enhance creativity point to respondents' recognition of its relative advantage over conventional marketing approaches. The perception that AI makes marketing easier also reflects compatibility with students' existing digital practices and business needs. However, the uncertainty surrounding cost-effectiveness suggests that not all dimensions of AI's relative advantage have been fully established among undergraduate entrepreneurs. This implies that while many respondents have progressed beyond the persuasion stage and recognise AI's practical value, complete confirmation of its benefits, particularly its economic value, has yet to occur.

Factors Affecting the Use of AI Marketing Tools

The findings indicate that the adoption of AI marketing tools among undergraduate entrepreneurs is constrained by a combination of economic, knowledge-based, institutional, and social factors. Lack of awareness emerged as the most prominent barrier, with 74.7% of respondents (44.0% strongly agree; 30.7% agree) identifying it as a major impediment to AI adoption. This finding suggests that while general awareness of AI may be widespread, many undergraduate entrepreneurs still lack sufficient knowledge of specific AI marketing applications and their business value. It lends support to Khalkhali et al.'s (2021) argument that unfamiliarity with AI capabilities and inadequate exposure discourage adoption, particularly during the early stages of technology diffusion. It also aligns with the findings by Ramesh and Chawla (2022) that student entrepreneurs often recognise the potential of AI but lack the practical understanding needed to integrate it into their businesses. The finding therefore underlines the distinction between being aware of AI as a concept and possessing the knowledge required for meaningful adoption.

The findings further reveal that inadequate training (71.3%) and lack of skills (65.4%) constitute major barriers to AI marketing tool adoption. These factors are closely related and suggest that many undergraduate entrepreneurs have not acquired the competencies required to effectively utilise AI technologies. This observation corroborates the view of Arsenijevic and Jovic (2019) that implementing and optimising AI applications requires technical expertise that many student entrepreneurs have yet to develop. Similarly, Heidenreich et al. (2021) emphasised that entrepreneurship programmes providing practical exposure to AI technologies significantly improve adoption, implying that limited access to such experiential learning opportunities may explain the constraints observed in this study. The results also resonate with the findings by Nwachukwu et al. (2021) that balancing academic demands with business activities often leaves students with insufficient time to acquire advanced digital skills, which, as expected, limits effective AI utilisation.

Cost also emerged as a significant constraint, with 68.0% of respondents agreeing that financial considerations affect their use of AI marketing tools. This supports the finding by Khalkhali et



al. (2021) that financial limitations are one of the principal barriers to AI adoption among student entrepreneurs, as well as the results of Adeyinka et al.'s (2024) study of Nigerian businesses which revealed that infrastructure costs and financial capacity significantly influence AI implementation. Given that undergraduate entrepreneurs typically operate small-scale businesses with limited financial resources, the perceived cost of acquiring premium AI tools, internet access, and supporting infrastructure may discourage sustained adoption despite recognising AI's potential benefits.

Although peer influence was comparatively less pronounced, 67.3% of respondents still agreed that it affects their adoption of AI marketing tools. This suggests that social interaction remains an important driver of technology acceptance among undergraduate entrepreneurs. The finding reflects Rogers' (2003) argument that communication channels and social systems shape innovation diffusion by exposing potential adopters to the experiences and opinions of others. It also complements Heidenreich et al.'s (2021) observation that supportive entrepreneurial ecosystems encourage experimentation with emerging technologies through peer learning and shared experiences.

These findings provide strong support for the Diffusion of Innovations Theory. Rogers (2003) argues that innovation adoption depends not only on awareness but also on the interaction between individual capabilities, communication networks, and the perceived attributes of an innovation. The prominence of lack of awareness indicates that many undergraduate entrepreneurs have yet to fully progress through the knowledge stage (even though they may have some level of awareness already, as found in this study), while the significance of inadequate skills, training, and cost suggests that perceived "complexity" and limited "trialability" continue to impede movement towards implementation and confirmation. Furthermore, the influence of peers' points to the importance of "observability" and social systems in accelerating diffusion, as students are more likely to adopt AI after witnessing successful use by others.

Conclusion

The study concludes that although undergraduate entrepreneurs recognise the value and potential of AI marketing tools, their adoption remains constrained by interrelated factors including knowledge, skill, finance, and institutional support. The findings demonstrate that lack of awareness of specific AI marketing applications constitutes the greatest barrier, indicating that awareness of AI as a general technological concept does not necessarily translate into an understanding of its practical business applications. This gap is further compounded by inadequate training and insufficient technical skills, which may be an indication that many undergraduate entrepreneurs are not yet adequately equipped to sufficiently integrate AI into their marketing activities. Financial limitations also continue to hinder adoption, reflecting the realities of student-owned enterprises that often operate with limited resources and cannot easily invest in premium AI tools or supporting infrastructure. Though peer influence was comparatively less prominent among factors that influence adoption of AI tools, its significance indicates that social interaction and exposure to successful users remain important mechanisms through which AI adoption can be encouraged.



In a nutshell, the findings suggest that AI marketing adoption among undergraduate entrepreneurs is influenced by more than the perceived usefulness of the technology. Successful adoption depends on creating an enabling environment that combines awareness with practical competence, affordable access, institutional support, and opportunities for experimentation. The findings therefore affirm the relevance of the Diffusion of Innovations Theory, particularly its emphasis on knowledge, communication channels, innovation attributes, and social systems as determinants of adoption. Results indicate that many undergraduate entrepreneurs remain in the early stages of the innovation diffusion process and require additional support to progress towards sustained implementation and confirmation. This underscores the role of institutional structures in fostering the culture of AI-assisted marketing among undergraduate entrepreneurs.

Recommendations

The following recommendations were made based on the findings and conclusions of this study:

1. Universities and entrepreneurship support units should complement the high level of awareness of AI marketing tools by providing targeted training on less familiar applications, particularly web analytics and influencer identification tools. This will broaden undergraduate entrepreneurs' knowledge and enable them to utilise a wider range of AI tools for more effective marketing decision-making.
2. Undergraduate entrepreneurs should be encouraged to integrate AI marketing tools more consistently into their business activities through practical training, mentorship, and entrepreneurship development programmes. This will help bridge the gap between awareness and actual usage, this way promoting the regular application of AI tools beyond content creation to more strategic marketing functions.
3. Entrepreneurship educators and business support organisations should strengthen students' understanding of the practical and economic benefits of AI marketing tools by incorporating real-life demonstrations, case studies, and success stories into training programmes. This will reinforce the positive perceptions of AI while addressing the uncertainty surrounding its cost-effectiveness.
4. Universities, government agencies, and entrepreneurship development organisations should address the barriers to AI adoption by providing affordable access to AI marketing tools, expanding training opportunities, and equipping undergraduate entrepreneurs with the necessary digital skills. These measures will reduce the effects of these barriers, thus encouraging greater adoption and effective use of AI marketing tools.
5. Future researchers should conduct qualitative studies to offer deeper insights into how undergraduate entrepreneurs in Anambra State are engaging with AI marketing tools. Similarly, comparative research involving some other states of the country will broaden understanding on the subject matter.



REFERENCES

- Adeyinka, K. I., Chiwaridzo, T. & Adeyinka, T. I. (2024). Artificial intelligence (AI) algorithms in Nigeria's integrated marketing communications. DOI: 10.4018/979-8-3693-2165-2.ch004
- Arsenijevic, U. & Jovic, M. (2019). Artificial intelligence marketing: Chatbots. Paper presented at the 2019 International Conference on Artificial Intelligence: Applications and Innovations (IC-AIAI), Belgrade, Serbia. DOI: 10.1109/IC-AIAI48757.2019.00010.
- Ataide, H. O. (2024). Information and communication technology (ICT) and entrepreneurship development in Nigeria. *AKSU Journal of Administration and Corporate Governance*, 4(3), 77 – 88. Retrieved from https://aksujacog.org.ng/articles/24/08/information-and-communication-technology-ict-and-entrepreneurship-development-in-nigeria/aksujacog_04_03_07.pdf
- Bassey, R. G., Brownson, G. D. & Efi, A. (2025). Artificial intelligence (AI) power and entrepreneurial success. *British Journal of Management and Marketing Studies*, 8(1), 49 – 66. DOI: 10.52589/BJMMSCFWU44NZ
- Bhat, A. K. (2025). The evolution of AI: From foundations to future prospects. Retrieved from <https://www.computer.org/publications/tech-news/research/evolution-of-ai>
- Choudhury, R. G. (2022). Entrepreneurship and marketing – The essential complementarity of purpose. *IOSR Journal of Business and Management*, 24(8), 01 – 08. DOI: 10.9790/487X-2408030108 www.iosrjournals.org
- Collins, C., Dennehy, D., Conboy, K., & Mikalef, P. (2021). Artificial intelligence in information systems research: A systematic literature review and research agenda. *International Journal of Information Management*, 60, 102383. Retrieved from <https://rsisinternational.org/journals/ijriss/view/the-conceptual-ambiguity-of-ai-adoption-a-construct-clarification-and-layered-taxonomy>
- Espina-Romero, L., Sánchez, J. G., Gutiérrez, H., Conde, H., Castro, Y., Cajo, L. E., & Corredoira, J. (2023). Which Industrial Sectors Are Affected by Artificial Intelligence? A bibliometric analysis of trends and perspectives. *Sustainability*, 15(16), 12176. Retrieved from <https://doi.org/10.3390/su151612176>
- Ewanlen D. O. & Asaolu, O. A. (2023). Artificial intelligence in marketing: Whither Nigeria! *International Journal of Social Sciences and Management Research*, 9(10), 30 – 42. Retrieved from https://www.researchgate.net/publication/376612448_Artificial_Intelligence_in_Marketing_Whither_Nigeria
- Goodfellow, I., Bengio, Y., & Courville, A. (2016). *Deep learning*. California: MIT press.
- Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education: Promises and implications for teaching and learning*. Center for Curriculum Redesign. Retrieved from <https://curriculumredesign.org/wp-content/uploads/AIED-Book-Excerpt-CCR.pdf>
- Kumar, V., Ashraf, A. R. & Nadeem, W. (2024). AI-powered marketing: What, where, and how? *International Journal of Information Management*, 77, 1 – 17. Retrieved from <https://doi.org/10.1016/j.ijinfomgt.2024.102783>.



- Labib, E. (2024). Artificial intelligence in marketing: exploring current and future trends. *Cogent Business & Management*, 11(1). Retrieved from <https://doi.org/10.1080/23311975.2024.2348728>
- LeCun, Y., Bengio, Y., & Hinton, G. (2015). *Deep learning*. *Nature*, 521(7553), 436–444. Retrieved from <https://doi.org/10.1038/nature14539>
- Masod, M. Y. B. (2026). The conceptual ambiguity of AI adoption: A construct clarification and layered taxonomy. *International Journal of Research and Innovation in Social Science*, 10(4), 7993–8004. Retrieved from <https://doi.org/10.47772/IJRISS.2026.100400567>
- Moubouti, G. M. M. (2023). Student Entrepreneurship and business creation (Master's thesis, Final International University). Retrieved from <https://www.final.edu.tr/docs/tezler/Julia%20Magda%20Makita%20%20%20thesis.pdf>
- Moustapha, A. A. & Yusuf, I. O. (2023). Adoption of artificial intelligence to improve library service delivery in academic libraries in Kwara state, Nigeria. *Library Philosophy and Practice (e-journal)*, 1 – 14. Retrieved from <https://digitalcommons.unl.edu/libphilprac/7915>
- Nwachukwu, P. I., Obisanma, O., Kuromiema, K., Maurice, P. & Obatola, A. T. (2021). The influence of entrepreneurship education on students' business venturing in tertiary institutions in Nigeria. *International Journal of Research and Innovation in Social Science*, V(VI), 530 – 525. Retrieved from <https://rsisinternational.org/journals/ijriss/Digital-Library/volume-5-issue-6/520-525.pdf>
- Nwankwo, C. & Abude, P. (2024). Artificial intelligence and marketing: A conceptual analysis. *UNIZIK Journal of Marketing*, 1(4), 90 – 96. Retrieved from <https://journals.unizik.edu.ng/ujofm/article/view/5008>
- Okolie, U. C. (2024). A Longitudinal study of conditional student entrepreneurship in an emerging economy. *Entrepreneurship Theory and Practice*, 49(1), 89-128. Retrieved from <https://doi.org/10.1177/10422587241254062>
- Onjewu, A.-K. E., Godwin, E. S., Azizsafaei, F., & Appiah, D. (2024). The influence of technology use on learning skills among generation Z: A gender and cross-country analysis. *Industry and Higher Education*, 39(2), 139 – 157. Retrieved from <https://doi.org/10.1177/09504222241263227>
- Ononokpono, N. J., Osademe, G. C. & Olasupo, A. R. (2023). Artificial Intelligence Milieu: Implications for Corporate Performance in the Nigerian Banking Industry. *International Journal of Research and Scientific Innovation (IJRSI)*, 8(5), 131-135. Retrieved from <https://ideas.repec.org/a/bjc/journal/v8y2023i5p131-135.html>
- Ramesh, A. & Chawla, V. (2022). Chatbots in marketing: A literature review using morphological and co-occurrence analyses. *Journal of Interactive Marketing*, 57(3), 472-496. <https://doi.org/10.1177/10949968221095549>
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.
- Sadiq, O., Hack-Polay, D., Fuller, T. & Rahman, M. (2022). Barriers to the effective integration of developed ICT for SMEs in rural Nigeria. *Businesses*, 2(4), 501 – 526. Retrieved from <https://doi.org/10.3390/businesses2040032>
- Santos-Jaén, J. M., León-Gómez, A., Valls Martínez, M. del C., & Llorente Muñoz, V. (2025). University students' perceptions of the impact of artificial intelligence in the business



- sector on their educational and professional development. *Education and Information Technologies*, 30(17), 24395–24428. <https://doi.org/10.1007/s10639-025-13712-4>
- Turing, A. M. (1950). Computing machinery and intelligence. *Mind*, 49(236), 433-460. Retrieved from <https://doi.org/10.1093/mind/LIX.236.433>
- Ukpong, E. G., Udoh, I. I. & Essien, I. T. (2019). Artificial intelligence: Opportunities, issues and applications in banking, accounting, and auditing in Nigeria. *Asian Journal of Economics, Business and Accounting*, 10(1), 1 – 6. Retrieved from file:///C:/Users/USER/Downloads/Artificial_Intelligence_Opportunities_Is.pdf
- Verma, S., Sharma, R., Deb, S. & Maitra, D. (2021). Artificial intelligence in marketing: Systematic review and future research direction. *International Journal of Information Management Data Insights*, 1(1), 229 – 241. <https://doi.org/10.1016/j.jjime.2020.100002>.
- Wilendra, W., Nadlifatin, R & Kusumawulan, C. K, (2024). ChatGPT: The AI game-changing revolution in marketing strategy for the Indonesian cosmetic industry. *Procedia Computer Science*, 234, 1012 – 1019. Retrieved from <https://doi.org/10.1016/j.procs.2024.03.091>.
- Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education – Where are the educators? *International Journal of Educational Technology in Higher Education*, 16(39), 1 – 27. Retrieved from <https://doi.org/10.1186/s41239-019-0171-0>