Impact Evaluation of the Igbo Apprenticeship System:

Multi-component Frameworks for Sustainable Entrepreneurship

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CHIOMA ALEXANDRA ILEKA

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Members of the Examining Committee:
Professor Arjun Bedi
Professor Lorenzo Pellegrini

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Inquiries:
International Institute of Social Studies
P.O. Box 29776
2502 LT The Hague
The Netherlands
t: +31 70 426 0460
e: info@iss.nl
w: www.iss.nl
fb: http://www.facebook.com/iss.nl
twitter: @issnl

Location:
Korternaerkade 12
2518 AX The Hague
The Netherlands

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Acronym

IAS- Igbo Apprenticeship System
OLS- Ordinary least squares
PSM-Propensity score matching
IV- Instrumental Variable
WEE - Women's Economic Empowerment
FAM- Female Apprenticeship Model

Keywords

Impact evaluation, Igbo Apprenticeship System, Local Development Strategies, Multi-Componentality and Cyclicality in Economic Models, Sustainable Economic Empowerment, WEE, SDG's.

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Abstract

This study evaluates the impact of the Igbo Apprenticeship System (IAS), a locally developed entrepreneurship model, on business outcomes, specifically profitability, customer growth, revenue increase, and profit reinvestment, using a sample of 591 Nigerian business owners in Lagos and Anambra State. Employing Ordinary Least Squares (OLS), Instrumental Variable (IV) estimation, and Propensity Score Matching (PSM), the study compares the effect of IAS participation versus non-participation. The findings reveal robust positive effects across all methods, with notable gains in business profitability (OLS: **0.2779**, IV: **0.2414**, PSM: ATT **0.2754** & ATET **0.2677**), Customer growth (OLS: **0.2868**, IV: **0.2189**, PSM: ATT **0.2314** & ATET **0.2538**), revenue Increase (OLS: 0.5374, IV: **0.5276**, PSM: ATT **0.4920** & ATET **0.4750**), business satisfaction (OLS: **0.2386**, IV: **0.2007**, PSM: ATT **0.1635** & ATET **0.1489**), profit reinvestment (OLS: **0.1276**, IV: **0.0554**, PSM: ATT **0.0737** & ATET **0.1976**), underscoring the efficacy of IAS's multicomponent structure. Key lessons from the IAS's **multi-componentality** and **cyclicality** reveal that the combined effect of mentorship, hands-on training, and capital support not only contributes to business success but also cultivates a self-perpetuating cycle through community-based empowerment. As apprentices transition into business owners, they, in turn, mentor the next generation, reinforcing a self-sustaining model that continuously fuels local economies and reduces poverty. This cyclicality ensures that the benefits of IAS extend beyond individual participants, creating a ripple effect of economic and social upliftment within communities. These findings contribute to the understanding of how indigenous apprenticeship models may serve as effective mechanisms for economic empowerment in the realm of entrepreneurship. By emphasizing the compounded benefits of mentorship, skill transfer, financial support, and the cyclic, self-reinforcing structure of IAS, this study offers valuable insights for policymakers aiming to design apprenticeship-based entrepreneurship programs for sustainable development and poverty reduction.

Relevance to Development Studies

This study contributes to development studies by providing empirical insight into an indigenous, community-driven approach to economic empowerment. In contrast to the typical top-down models often implemented in development, the Igbo Apprenticeship System (IAS) demonstrates the power of grassroots, **locally developed solutions** that arise from the needs and realities of local communities. This research emphasizes the value of "bottom-up" strategies in creating sustainable economic growth, highlighting how community-based frameworks can foster resilience and self-sufficiency in ways that externally imposed programs could gain insights from.

Furthermore, the study enriches the field by analyzing the IAS's multi-component approach, combining mentorship, training, and resource transfer to drive business success. By documenting how these interconnected elements work together, the research underscores the importance of **multi-dimensional empowerment** models, offering a counterpoint to development programs that focus narrowly on one or two elements, such as funding or training alone. This insight supports broader theories in development studies that argue for integrated approaches to poverty reduction and economic growth, especially in informal economies.

Lastly, the IAS's alignment with Sustainable Development Goals, particularly **SDG 1 (No Poverty)** and **SDG 8 (Decent Work and Economic Growth)** demonstrates that locally grounded models can play a significant role in achieving global development objectives. The study suggests that scalable lessons from the IAS model could inform policies and programs in similar socio-economic contexts worldwide, adding a valuable case of indigenous innovation to the development studies literature.

1. INTRODUCTION

Nigeria, Africa's most populous country, faces significant economic challenges despite its vast potential. With over 83 million people living below the poverty line, representing approximately 40% of the population, poverty in Nigeria is both pervasive and unevenly distributed across the country. According to the National Bureau of Statistics (NBS, 2022), states like Ondo have a lower incidence of multidimensional poverty[1] 27%, while states like Sokoto struggle with rates as high as 91%. At the heart of many discussions around poverty reduction and economic resilience lies entrepreneurship, often seen as a key driver of development (Naudé, 2010; Anokhin, Grichnik & Hisrich, 2008). However, in Nigeria, for many, entrepreneurial success remains elusive. In many developing countries, entrepreneurial ventures have not achieved the success seen in more developed nations (Agu and Nwachukwu, 2020). This disparity is particularly acute in Africa, a continent poised at the epicentre of a demographic youth bulge, with half of its population below the age of 18 (Ikelegbe, 2020).

In many developing continents, particularly in Africa, entrepreneurial ventures have not achieved the same success as seen in more developed nations, facing significant challenges in scaling and job creation (Agu and Nwachukwu, 2020). However, despite these obstacles, entrepreneurship has become the primary means of survival for millions of Africans across all age groups. In Nigeria, for instance, the informal sector makes up approximately 65% of the total economy, contributing significantly to employment and GDP (International Labour Organization, 2018). The majority of families at the lower-income levels are embedded in this informal sector, which spans everything from small-scale farming to retail trading.

Entrepreneurship in Africa often manifests itself in diverse forms, such as the farmer who cultivates and sells crops to support their family, the man who imports pesticides for wholesale distribution, or the woman who sells children's toys in local markets. These efforts, though often small and undercapitalized, allow individuals to strive against poverty and make ends meet. According to the International Monetary Fund (IMF), the informal economy in sub-Saharan Africa contributes over 40% to the region's GDP (IMF, 2017). Both men and women play critical roles in entrepreneurship, each striving to provide for their households, albeit in different capacities. Men might engage in larger-scale ventures like importing goods, while women often run smaller-scale businesses such as street vending or market trading. Despite these differences in business size and sector, the goal remains the same: to meet the needs of their households and secure financial stability. This entrepreneurial drive among both genders highlights the critical role that small businesses play in supporting families and creating economic resilience in Africa despite the widespread informal nature of many of these activities.

Entrepreneurship, while essential for economic survival in Africa, faces numerous challenges that limit the growth and sustainability of small and medium enterprises (SMEs) across the continent. In Africa, SMEs account for over 80% of jobs across various sectors, yet they struggle with access to finance, infrastructure, market linkages, and regulatory barriers (World Bank, 2020). In Nigeria, these challenges are even more pronounced. Many entrepreneurs find it difficult to secure capital for their businesses, as traditional banks often impose stringent collateral requirements and offer high-interest loans that are inaccessible to most informal businesses (Gbandi & Amissah, 2014).

[1] Map of Nigeria in Appendix A showing the poverty rates in different states.

According to the World Bank, 600 million jobs will be needed by 2030 to absorb the growing global workforce, which makes SME development a high priority for many governments around the world (World Bank, 2019). Another significant challenge is the absence of adequate business training and mentorship**.** According to research carried out in Nigeria, many SME entrepreneurs lack education or access to professional networks that could provide essential knowledge in areas like business management, customer acquisition, and market orientation (Oriaku, 2021)**.** Results showed that most SMEs..."*are operated by persons with little or no knowledge of business management, hence their abysmal performance"* (Oriaku, 2021). This knowledge gap limits their ability to scale their ventures effectively and sustainably. Moreover, entrepreneurs often face difficulties in acquiring productive assets, which are critical for business expansion but typically require financial resources that are not readily available.

Amidst the challenges and gaps in Nigeria's economic landscape, the Igbo Apprenticeship System (IAS) stands out as a potential model for sustainable entrepreneurship. Originating in the southeastern region of Nigeria, where the country's lowest poverty rates are recorded, the existing literature, based mainly on qualitative data, shows that IAS has played a role in reducing unemployment and fostering economic resilience (Kenneth et al., 2023) and Neuwirth (2018) hailed the IAS as a successful informal business training models and one of the world's largest and most effective informal business incubators. An estimated 60-80% of Igbo business owners in major Nigerian markets have received IAS training, demonstrating the system's widespread influence in fostering entrepreneurship (Obunike, 2016; Iwara et al., 2019). Given its generational reach, nearly every Igbo family has had one or more relatives participate as mentors or apprentices in the IAS, and there are approximately 35 million Igbos in Nigeria. (Cia.gov, 2024).

The system operates on a **mentor-apprentice framework**, where young, often unskilled individuals - apprentices are taken under the mentorship of successful business owners for several years. Participants in the IAS, often with little or no formal education, receive hands-on training in trade, business management, and customer relations, (Agozino & Anyanike, 2007). Typically, after completing their apprenticeship, (called "Nwa Boi") and acquiring practical skills essential for running a business, participants receive seed capital or startup resources from their mentors to start their businesses (Eze, 2018). Research shows that this system fosters cyclical **community-driven empowerment**, as many apprentices go on to become successful business owners who, in turn, ***"pay it forward"***[1] by becoming mentors and financially supporting the next generation of entrepreneurs, perpetuating a cycle of knowledge transfer and economic empowerment (Igwe, Adebayo & Ogundana, 2018). This community-oriented system is particularly advantageous to participants from economically disadvantaged backgrounds, offering them not only vocational training but also a path to financial independence and social mobility (Ugwu, 2023).

Despite its apparent role in fostering entrepreneurship and economic empowerment, the Igbo Apprenticeship System (IAS) has several limitations. One of the challenges is that the IAS operates within an informal structure that lacks standardized training and certification processes, leading to inconsistent skill development among apprentices (Igwe et al., 2018). Furthermore, the system's over-reliance on informal trust relationships leaves apprentices vulnerable to exploitation, with some mentors failing to fulfil their promises of capital or settlement at the end of the training period (Obunike, 2016).

[1] The concept of *"pay it forward"* refers to helping someone without expecting a direct payment in return, with the hope that they will, in turn, help others in the future. Instead of repaying the favor directly, you pass on the kindness to others, creating a ripple effect of goodwill. This 'paying it forward' approach helps build a community rooted in compassion and generosity, where acts of kindness continue to spread and benefit more people over time.

Additionally, the Igbo Apprenticeship System (IAS) faces challenges in scalability, as its reliance on personal relationships and community ties makes it difficult to replicate beyond local contexts (Eze, 2018). Moreover, the system has been slow to adapt to modern economic trends, particularly in sectors driven by technology and digital advancements, which may limit the ability of IAS participants to compete in today's evolving business landscape (Adesoji, 2021). Apprentices, many of whom come from economically disadvantaged backgrounds, often face additional financial pressures that can force them to drop out, undermining the system's goal of economic empowerment (Agozino & Anyanike, 2007). Finally, although IAS provides initial seed capital, many apprentices struggle to access formal credit and other financial resources needed to scale their businesses, which could limit their long-term success and growth (Nwaka, 2015).

Amidst these limitations, one of the most pressing challenges is the **gender bias** within the Igbo Apprenticeship System (IAS). The system has struggled with inclusivity for women, who often face restricted access to certain trades within the apprenticeship framework (Agozino & Anyanike, 2007). IAS remains predominantly male-dominated, and women are frequently excluded from fully benefiting from the system's core components; **mentorship, training, and start-up capital** (Agozino & Anyanike, 2007). This exclusion is largely rooted in cultural beliefs that label men as providers and women as caregivers, resulting in empowerment opportunities being skewed toward men. This is despite the fact that women constitute a significant portion of small and medium-sized enterprise (SME) owners and play a critical role in supporting their families' livelihoods in Nigeria (Campos and Gassier, 2017). The exclusion of women from the system starkly contrasts with their undeniable contributions to the economy, particularly in sectors like trade and small-scale business.

Historically, entrepreneurship has been perceived as a male-driven field. However, the landscape is evolving; in recent years, the gender gap in entrepreneurship has narrowed significantly. Women now constitute a substantial share of Nigeria's entrepreneurial population. According to the State of Entrepreneurship in Nigeria, while men account for 57% of business owners, women represent an impressive 43%, reflecting their growing influence in the business sector (FATE Foundation, 2023). Women are equally represented among entrepreneurs as men. According to the World Bank, Sub-Saharan Africa is set apart from all other regions in the world, especially the Middle East and North Africa, where there is a large gender gap in participation in entrepreneurship (Campos and Gassier, 2017). This prompted important questions that form the motivation of this research: first is there empirical evidence of the impact of IAS on business outcomes for entrepreneurs who went through the system? And if there is, 'What could be the impact on entrepreneurial women if they had access to the same benefits that the IAS provides its participants?

Hence, to address these motivating questions, this study focuses its scope by analyzing the impact of the Igbo Apprenticeship System (IAS) based on its core components, namely **mentorship**, **training**, and **cash/goods settlement**, on business outcomes for participants. The primary objective is to empirically assess how the IAS influences key business metrics such as ***revenue growth, business expansion, customer base growth, rate of reinvestment of profits*** and ***profitability***. This research is designed to integrate the core elements of the IAS as *key explanatory variables,* offering a more nuanced understanding of the system's underlying principles. By doing so, it provides deeper insights into the mechanisms that potentially drive the IAS's success in fostering sustainable and self-sustaining economic development.

While numerous studies have highlighted the economic impact of the Igbo Apprenticeship System (Familoni, 2024; Ekekwe, 2022; Nnonyelu, 2020; Iwara et al., 2019; Ugwu, 2023; Adeola, 2020; Obunike, 2016; Igwe et al., 2018), much of the existing research has relied on qualitative approaches such as case studies and theoretical analyses. Although these studies offer valuable insights, they fall short of providing the rigorous empirical analysis needed to fully assess the system's impact. This leaves a gap in the literature, as few studies have quantitatively evaluated the effect of the IAS (Ekesiobi and Dimnwobi, 2019). To address this gap, the current study conducts a comprehensive quantitative analysis to provide a robust evaluation of the IAS's measurable economic impact through its core components, offering fresh, empirical insights into its mechanism and effectiveness.

To achieve this, the analysis draws on primary data collected from 14 selected market clusters in Anambra and Lagos States, regions known for their high levels of commercial activity. Respondents were sampled to ensure a balanced representation of both treatment (IAS participants) and control (non-participants) groups. To provide a nuanced and accurate understanding of the IAS while accounting for self-selection into the IAS, this research employs various econometric techniques, including **Ordinary Least Squares (OLS)**, **Instrumental Variable (IV) estimation**, and **Propensity Score Matching (PSM)**.

Both OLS and PSM support the identification of the IAS after controlling for observable characteristics that may influence both participation in IAS and the effect of the IAS. However, it is possible that unobserved aspects such as motivation may influence participation and the impact of the IAS and thus lead to biased estimates of the effect of the IAS on business success. Although it is hard to find good instruments, the study performs various tests to identify valid Instrumental Variables (IV) and attempts to isolate an unbiased effect of the IAS.

1.2 Research Objective, Justification, And Hypothesis

1.2.1 Objective

The primary goal of this study is to analyze the impact of the Igbo Apprenticeship System (IAS) and its components (mentorship, training, and cash/goods settlement) on business outcomes (revenue growth, business expansion, customer base growth, rate of reinvestment of profits and profitability).

1.2.2 Research Justification

The Igbo Apprenticeship System (IAS) has been identified as one of Nigeria's most successful Indigenous economic empowerment frameworks, promoting business success through a multi-approach that combines ***mentorship, skill transfer,*** *and* ***resource capital sharing***. Despite its purported impact on entrepreneurial growth, there is a lack of quantitative research that has analysed the system's effectiveness. This study is justified on three primary fronts:

First, the study provides empirical rigor to the assessment of an indigenous model IAS, a field often dominated by qualitative analysis. By quantitatively analyzing the IAS's impact on business outcomes based on its core principles using techniques like **Propensity Score Matching (PSM)**

and **Instrumental Variable (IV) estimation**, the study offers robust evidence of IAS's impact on business outcomes.

Secondly, the study expands the discourse on **localized development strategies** by challenging the reliance on top-down policies. Instead, it investigates a bottom-up, culturally relevant solution that has the potential to be replicated in similar socio-economic contexts worldwide. By evaluating the IAS's impact, focusing on the effects of its multi-componentality on various business outcomes, the research assesses the principles of the IAS. Potentially, its unique mechanisms of combining mentorship, training, and resource transfer create a self-sustaining model where beneficiaries become mentors themselves, perpetuating the system's cyclical nature. This aligns directly with *Sustainable Development Goals (SDGs),* specifically ***SDG 1 (No Poverty)*** and ***SDG 8 (Decent Work and Economic Growth),*** by fostering long-term economic growth. Although locally developed, this research seeks to draw broader lessons from the IAS model that could inform similar development strategies globally.

Finally, the study emphasizes the IAS as a **Multi-Component Framework for Entrepreneurship**. While most empowerment initiatives focus on single elements or the combination of two elements, like training & financial support, this research highlights the synergistic effect of combining mentorship, training, and capital, especially in informal economies. The IAS's multi-faceted approach could serve as an addition to the ongoing question, 'What can be done to help develop local businesses for sustainable and long-term effects on poverty reduction in developing economies?' (Fiala, 2013). Ultimately, the study offers practical policy insights and a deeper understanding of how indigenous systems can be leveraged for broader societal impact in regions with similar socio-economic backgrounds. Thus, it contributes to a bottom-up approach to development strategies aimed at poverty reduction and sustainable economic growth.

1.3 Originality

The originality of this research stems from its in-depth examination of the Igbo Apprenticeship System (IAS), an indigenous entrepreneurship model that integrates mentorship, training, and cash/asset transfers as its core components. The study's approach to examining the impact of multicomponent frameworks for entrepreneurship focusing on an indigenous system, the Igbo Apprenticeship System (IAS). While multi-component models combining mentorship, skill transfer, and financial support are increasingly discussed in economic empowerment literature, empirical testing in specific cultural contexts remains limited. By analyzing the IAS, this study provides evidence that a combination of factors, rather than isolated interventions, is essential for sustained entrepreneurial success. The novelty of this research lies in the empirical exploration of a culturally developed, community-based model, offering insights that could potentially inspire scalable empowerment solutions within informal economies.

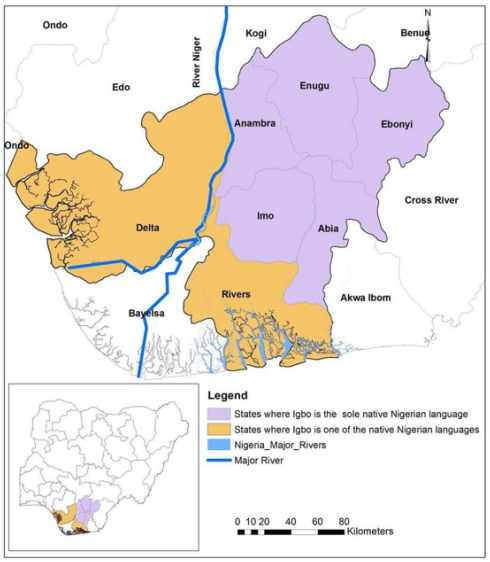
2.0 LITERATURE REVIEW

2.1 Background of the Igbo Apprenticeship System (IAS)

2.1.1 Historical Context

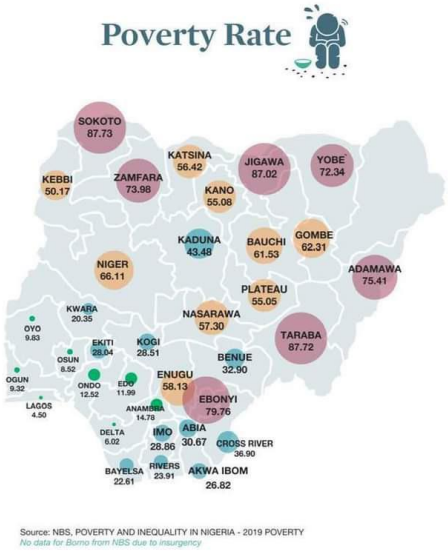
The Igbo Apprenticeship System (IAS), locally referred to as "Igba-Boi," traces its origins to the pre-colonial era, serving initially to support the agrarian economy through informal trading activities among the Igbo tribes[2] in Nigeria (Ekekwe, 2022; Ugwu, 2023; Familoni, 2024). The structure and prominence of IAS evolved following the Nigerian Civil War (1967-1970), during which many Igbo businesses were displaced. In the aftermath, the Igbos faced severe economic deprivation. After the Biafra state was defeated in January of 1970, the Nigerian government ordered that all currencies from the state, mainly held by Igbos, be deposited in banks. In return, each account holder received inadequate compensation from the government, as low as 20 pounds, regardless of the amount of money in their account, their previous achievements, or the losses they may have incurred during the war (Iwara et al., 2019).

Figure 1a: Map of Nigeria Showing the Igbo States



(Source Wikipedia)

Figure 1b: Poverty rate map in Nigeria states



(Source Wikipedia)

Post-war, this dire economic situation necessitated an ingenious response. The affluent and influential amongst the Igbos began to invest their scarce resources into nurturing the next generation of entrepreneurs through apprenticeships. This system became a crucial mechanism for economic recovery and sustenance, leading to the development of significant market systems in cities like Onitsha, Nnewi, and Aba. Largely, the Igbo apprenticeship system is a practical demonstration of the ubuntu philosophy — "*the belief in a universal bond of sharing that connects all humanity*" (Ekekwe, 2022). Unlike Western-style apprenticeships, the IAS is unique in its **cyclical nature**, wherein the principle of **"onye aghala nwanne ya"** (no one should leave their kin behind) ensures that those who have benefited from the system are expected to uplift others, thus reinforcing a culture of communal support and continuous economic growth (Ugwu, 2023).

[2] The Igbo tribe is one of the three major ethnic groups in Nigeria occupying mainly the south-eastern region, and they are estimated to be about 15.2% of a total population of 230 million, or approximately 35 million people. (Cia.gov, 2024).

As the world discusses inequalities with a push for stakeholder capitalism, the IAS has handled the equality part for centuries, making the Igbo states a relatively stable community in Nigeria; while Nigeria has an average literacy rate of 62%, most states within the IAS record an excess of 90% (Ekekwe, 2022). In Lagos, which is the Nigerian economic capital, Igbo businesses account for 74% of all investments (Iwara et al., 2019). In addition, the IAS is structured to ensure that everyone who is willing to learn and work has opportunity and support, and by doing that, it prevents extreme poverty and inequalities in communities. The implication is that largely equal communities have improved educational attainment and created stable societies (Iwara et al., 2019). While exact figures on the percentage of Igbos participating in this system are scarce, it is widely recognized as a prevalent practice among the Igbo people. The system's prominence is evident in its role in fostering entrepreneurship in the region.

2.1.2 Framework and Structure of the IAS

The IAS is fundamentally a mentorship system where young individuals, typically between the ages of 15 and 28, are placed under the guidance of established businessmen known as "Oga (Mentor)." These apprentices, or "Nwaboi (apprentice)," commit to an average of 4-6 years of service, learning the trade and business acumen directly from their mentors (Ikwuegbu et al., 2020). The relationship leads to a "settlement," where the master equips the apprentice with financial and material resources to start an independent business.

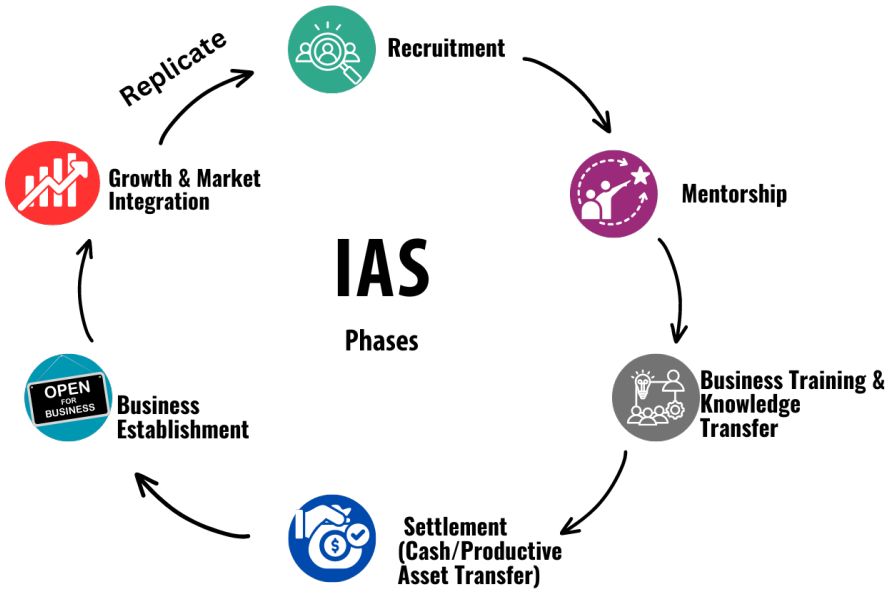


Figure 2: Phases of the Igbo Apprenticeship System (IAS). Created by the Author using Canva (Ileka, 2024).

Figure 2 illustrates the cyclical nature of the Igbo Apprenticeship System (IAS), a structure supported by the research of Adesoji (2021). The IAS is organized into seven phases, each strategically designed to ensure thorough training and the transition of apprentices into independent entrepreneurs. This progression, as highlighted by Obunike (2016), Igwe et al. (2018), and Agozino et al. (2007), reflects a comprehensive approach to the development of entrepreneurial skills, with each phase building on the last to create a pathway to success.

2.1.3 Phases of the Igbo Apprenticeship System (IAS)

The Igbo Apprenticeship System (IAS) is a comprehensive model designed to transform young individuals into successful entrepreneurs through a structured sequence of seven phases. Each phase attempts to ensure that apprentices acquire the skills, knowledge, and resources necessary to thrive in the business world, ultimately contributing to the sustainability of the IAS.

1. Recruitment

The IAS journey begins with the *Recruitment* Phase. In this stage, successful business owners, known as mentors identify and select young individuals from their communities who show promise and eagerness to learn or in some cases the parents of the young boys seek out successful entrepreneurs in their community to train their child. These apprentices, often from disadvantaged backgrounds, are chosen based on their willingness to learn and their good character, with the aim of providing them with opportunities to succeed (Familoni, 2024). This phase, which is carried out informally, sets the foundation for their future training and integration into the business world.

2. Mentorship

Once recruited, the apprentices enter the *Mentorship* Phase. This stage is characterized by a hands-on, practical approach. During this phase, apprentices are immersed in real business scenarios, gaining experience under the close guidance of their mentors. It involves the apprentice being integrated into the mentor's business and learning environment. This immersion is designed to instill discipline, work ethics, and a deep understanding of business operations, forming the bedrock of their training (Adesoji, 2021). Its important to note that usually the apprentices get to access to the mentors even after the settlement as some of the mentors serve as credit suppliers to the apprentices (Familoni, 2024). This continued relationship not just provides guidance but emotional and psychological support post graduation.

3. Training & Knowledge Transfer

The core of the IAS lies in the *Training & Knowledge Transfer;* this phase covers all aspects of business, including financial management skills, marketing skills, customer acquisition skills, negotiation skills, customer relationship management, risk management, product sourcing and pricing, market orientation, and strategic planning. As they progress, apprentices engage in *trial-and-error learning*, where they are entrusted with goods by their mentor, applying what they have learned to make sales and remit profits to the mentor's business. This practical test is crucial as it determines their readiness to graduate from this phase, proving their ability to manage real-world business scenarios with minimal supervision. Success in this phase ensures that apprentices have mastered both the technical and managerial skills necessary for sustained business success (Igwe et al. (2018) & Agozino et al. (2007)

4. Settlement (Cash/Productive Asset Transfer)

As apprentices near the completion of their training, which could last for an average of *three years*, they move into the *Settlement* phase with either cash or productive asset transfer**.** Here, mentors provide apprentices with the capital needed to start their own businesses. This support can come in various forms, such as financial investment, goods, supply credit, or even the setup of a business

location. The mentor's resources and the apprentice's performance during training typically determine the extent of this support. This phase is crucial as it provides the tangible resources needed to launch their entrepreneurial ventures (Obunike, 2016; Adesoji, 2021; Familoni, 2024; Igwe et al., 2018; Agozino et al., 2007).

5. Establishment

Following the transfer of resources, the apprentice transitions into the *Establishment* Phase. In this phase, the former apprentice, now an entrepreneur, utilizes the skills, knowledge, and capital acquired to establish and run their own business. This phase tests the training received, where the entrepreneur begins to navigate the market, manage operations, and grow their enterprise independently. As identified from the study by Igwe et al. (2018., most apprentices tend to still engage their mentors for feedback on challenges, and mentors also serve as support as the apprentice source products from the mentors through supplier credit

6. Growth & Market Integration

This phase focuses on sustaining the business, integrating into the market, and contributing to the community's economic development. This phase involves maintaining the business, acquiring and retaining customers, and further developing business operations. Success in this phase solidifies the entrepreneur's role in the market and prepares them to give back to the community (Agozino et al. (2007)).

7. Replicate

The final phase, *Replicate*, underscores the **cyclical nature** of the IAS. Established entrepreneurs, who were once apprentices, now go on to recruit and mentor new apprentices, thus continuing the cycle. This phase is essential for the sustainability of the IAS, as it ensures the continuous empowerment of new generations. By replicating the process, these entrepreneurs not only expand their own businesses but also contribute to their communities' economic resilience, perpetuating the model's success and reinforcing its role as a bedrock for community empowerment.

The cyclical nature of the seven phases of the IAS, although carried out informally, are collectively designed to ensure a sustainable model in which successful entrepreneurs self-perpetuate the system, creating a continuous cycle of empowerment and economic growth within their communities.

2.2 Literature Review on Mentorship, Training, and Capital Effects on Entrepreneurship

The Igbo Apprenticeship System (IAS) is a model for sustainable entrepreneurship. The system consists of three essential principles: mentorship, training (knowledge transfer), and settlement/ funding. This section explores the literature, with a focus on the role played by the three aspects that characterize the IAS, that is, mentorship, training, and cash settlement/funding on various outcomes of interest.

2.2.1 Mentorship

Mentorship is a key driver for entrepreneurial success, fostering both personal and professional growth. It involves a relationship between an experienced mentor and a less experienced mentee, providing guidance, agency, and emotional and psychological support (MSC, 2023). Mentorship is especially critical in the context of entrepreneurship, where it helps to bridge gaps in knowledge, access to resources, and overall business management (Theaker, 2023). The role of mentorship goes beyond simple business advice. It involves fostering a mindset of "paying it forward," where successful entrepreneurs mentor others. This has been observed among both male and female mentors, who often seek to share their experiences and contribute to the entrepreneurial ecosystem (MSC, 2023).

Studies highlight the transformative impact of mentorship in various regions and industries. For instance, the Erasmus for Young Entrepreneurs (EYE) program in the European Union showed that 80% of mentored entrepreneurs succeeded in business, with 70% of mentored businesses surviving beyond five years, a rate double that of non-mentored businesses (MSC, 2023). This underscores the importance of mentoring relationships in increasing the longevity and success of startups.

In a Randomized Controlled Trial (RCT) conducted in Kenya, mentorship was shown to increase profits by 20% for female microenterprise owners over 18 months compared to those who lacked mentorship (Campos and Gassier 2017). Additionally, MicroSaving Consulting (MSC) in India analysis of 462 incubators and 112 accelerators, showed that mentored businesses had a 12% higher survival rate than non-mentored businesses (MSC, 2023). These findings are further echoed in Latin America, where mentorship for women-led businesses resulted in a 30% profit increase within the first year (Pereyra, Aboal, and Rovira, 2021).

In Uganda, Campos and Gassier (2017) identified gender-specific information barriers, particularly in male-dominated sectors. Their study revealed that only 25% of female entrepreneurs had access to mentorship, despite its proven effectiveness in supporting business success (MSC, 2023). This gap restricts women from entering more profitable industries and realizing their full entrepreneurial potential.

However, despite these benefits, research highlights significant gaps in mentorship access for women entrepreneurs. While mentorship significantly contributes to business success, it is not the sole factor driving outcomes; rather, it is part of a broader support network that fosters growth. Mentorship relationships, while offering valuable guidance, are most effective when complemented by additional support elements (Theaker, 2023).

A study in Uganda composed of 1,550 microenterprise owners found that combining loans, grants, and mentorship increased business expansion and job creation by 17% (Fiala, 2013). Another study

evaluating the impact of a government-sponsored C-Emprendedor program in Uruguay, which combined training and mentorship, demonstrated that this dual approach enhances entrepreneurial success by approximately 15%. This leads to improved management practices and sustained profitability, showcasing the importance of integrating mentorship with other support mechanisms like business training (Pereyra, Aboal, and Rovira, 2021). This aligns with the core principle of the Igbo Apprenticeship System (IAS), where mentorship is an essential element of the system, This then naturally brings us to the next crucial component: *Training*.

2.2.2 Training

Training is a fundamental component of entrepreneurial development, equipping both male and female entrepreneurs with essential skills to navigate business ownership complexities. Research consistently demonstrates the transformative effects of business training. For example, Cho et al. (2013) revealed that micro-entrepreneurs in Kenya who received training improved their business knowledge and decision-making.

This is particularly crucial for female entrepreneurs, who often face additional barriers in male-dominated sectors. Campos and Gassier (2017) highlighted that training enhances women's business management skills, helping bridge knowledge gaps and boosting confidence. Karlan and Valdivia (2011), in their study of women microfinance clients in Peru, found that those who participated in business training programs saw improved sustainability in their businesses. Likewise, Bjorvatn and Tungodden (2012) conducted an RCT study in Tanzania showing that women who received training exhibited increased entrepreneurial self-efficacy and were more likely to expand their businesses.

Many studies show that training alone enhances knowledge and attitudes, but the impact on profits and sales is less conclusive (Cho et al., 2013). Studies of intervention programs highlight that training, when paired with financial support, shows a complementary relationship between skills development and capital infusion. Nathan Fiala's experimental research in Uganda tested various constraints affecting business growth, and his findings showed that the most effective combination for entrepreneurs was the joint provision of training and loans (Fiala, 2013).

These studies underscore that while training is essential for entrepreneurial success, its impact is amplified when combined with financial resources. This conclusion sets the stage for discussing the final core component of the Igbo Apprenticeship System: *Funding*.

2.2.3 Settlement / Capital Funding

Financial support, whether in the form of grants, loans, or prizes, has been frequently cited as an essential component for entrepreneurial success. Yet, evidence shows that funding alone often falls short of driving meaningful and sustained business growth. Studies like that of Banerjee et al. (2013) show that the mere provision of capital through microfinance fails to significantly increase profits for small businesses. This gap in outcomes has led scholars to question the optimal conditions under which capital leads to measurable entrepreneurial success.

A study by de Mel, McKenzie, and Woodruff (2008**)** found that while cash grants had a positive effect on profits for male-run businesses in Sri Lanka, subsequent research by Fafchamps et al. (2013) pointed to the challenge that business owners often lack the skills or the financial acumen to use these funds effectively. This highlights a critical problem: capital infusion alone does not produce the desired results if entrepreneurs are not equipped with the necessary skills to maximize the benefit of these funds.

Recent findings by Pereyra, Aboal, and Rovira (2021) underscore the importance of pairing financial support with mentorship and training. Their evaluation of the *C-Emprendedor program*, designed to promote entrepreneurial activity in Uruguay, revealed that the lack of integration between financial support and business training/mentorship is one of the key reasons behind its limited impact. They suggest that an optimal combination of training, mentorship, and capital is essential to generate significant business growth and profitability. Empirical international evidence supports the idea that when capital is provided alongside training and mentorship, businesses are more likely to expand, survive, and thrive.

On this premise, attention is drawn to the Igbo Apprenticeship System (IAS), a model that synthesizes the three pillars: mentorship, skill transfer through training, and financial settlement (often in the form of cash or productive assets). Potentially, these components create a strong foundation for sustainable entrepreneurship.

Hence, the key contribution of this research is to empirically analyze the combined impact of these three components from a locally developed strategy. By examining how these core components (multi-componentality) affect business outcomes, this research will shed light on the compounded benefits of the IAS's unique model. This is particularly pertinent in developing countries, where entrepreneurship is hampered by limited access to mentorship, training, and capital, especially for marginalized entrepreneurs.

2.3 Conceptual framework

This study's conceptual framework is rooted in the core principles of the Igbo Apprenticeship System (IAS), an indigenous model of entrepreneurship. The IAS operates on three interconnected pillars: **mentorship**, **training (knowledge transfer)**, and **cash or asset settlement**, which work synergistically to promote sustainable business growth.

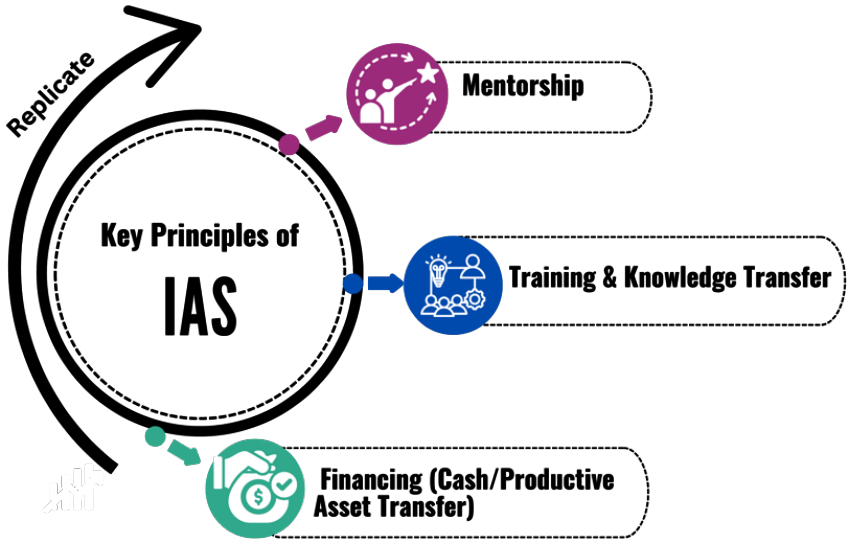


Figure 3: Illustrating Key Principles (Cyclical Nature and Core Components) of the Igbo Apprenticeship System (IAS). Created by the Author using Canva (Ileka, 2024).

Mentorship provides apprentices with the guidance and hands-on experience needed to navigate business challenges, offering both technical and emotional support. The training component involves the transfer of practical skills and business acumen, ensuring that apprentices are well-

prepared for their entrepreneurial journeys. Lastly, the settlement, typically in the form of seed capital or assets, ensures that graduates of the system have the resources required to launch their ventures. This framework not only fosters economic self-sufficiency but also embeds a cyclical process wherein successful graduates become mentors for the next generation, perpetuating the cycle of growth and empowerment. The study examines the combined impact of the multi-component nature and how it can serve as a model for sustainable development in entrepreneurship, particularly in contexts with limited access to formal business resources.

3.0 RESEARCH METHODOLOGY AND DATA COLLECTION

3.1 Research Design

This study utilizes a *quasi-experimental design*, to evaluate the impact of the multi-component IAS on business outcomes. The research is primarily cross-sectional, although it captures retrospective information about participants' past experiences (their time in the Igbo Apprenticeship System), the data itself is collected once also capturing their current business outcomes, financial status, and perceptions at the time of the survey. Structured questionnaires were employed *using purposive sampling* to gather the necessary information from respondents.

Respondents were divided into two main groups:
Treatment A– IAS Alumni - those who have completed the IAS and own a business.
Control Group – Non-participants of IAS (those who did not go through the IAS and own a business.

3.2 Population and Sample Size

Figure 4: Research Sample Locations (Source: Kobocollect Survey Map)

The study was conducted across two Nigerian regions: the East and the West, specifically targeting Anambra and Lagos States. Anambra, known for Onitsha Market; West Africa's largest open market and the origin of the Igbo Apprenticeship System (IAS) (Adi, 2012), was chosen for its vibrant commercial environment. Lagos, a major commercial hub in Nigeria's western region, was

selected to provide a contrasting economic setting, adding breadth to the study. This choice aligns with Ekesiobi and Dimnwobi's (2018) recommendation to include Lagos for its extensive market diversity, which broadens the variability among participants. IAS is notably consistent across regions, with minimal variations in practice and outcomes, as reported by Orugun and Nafiu (2014).

A purposive sampling technique was used to select 14 market clusters; seven in each state based on their high economic activity and sectoral diversity. Initially, the study aimed for 500 respondents (250 in each state) but ultimately achieved a sample size of 822, including 90 respondents who were current IAS participants not yet business owners.

Ten research enumerators were deployed in each state, each tasked with surveying an average of 10 respondents per day, with a target distribution of five non-participants, four IAS alumni, and one current participant. This balanced approach ensured representation from different groups, focusing on current business owners and participants in IAS to gather comprehensive insights into the system's impact.

3.2.1 Power Calculation

We conducted power calculations to ensure sufficient statistical power to detect differences across groups. Assuming a moderate *effect size of 0.3,* a significance level of *5% (a = 0.05),* and a desired power of *80% (β = 0.20*), the required sample size for each group (treatment and control) was approximately 176 respondents.

$$n = \frac{(Z_{\alpha/2} + Z_{\beta})^2 \cdot 2 \cdot \sigma^2}{\text{Effect Size}^2}$$

Where:

$$n = \frac{(1.96 + 0.84)^2 \cdot 2 \cdot 1^2}{0.3^2} \approx 175.4$$

$Z_{\alpha/2}$ is the z-score for the significance level

Z_{β} is the z-score for the desired power

σ is the assumed standard deviation

With a total sample of ***591 respondents[5] (283 Treatment and 308 Control),*** the study exceeds this requirement, providing a strong capacity to detect significant effects and conduct subgroup analyses. This ensures that the study is adequately powered to yield reliable and robust findings.

[4] An extra subgroup, *Treatment B,* which comprised Current IAS participants, was collected for deeper insights into motivation and perception of the IAS.

[5] A total sample size of ***822 respondents*** was collected, which, after data cleaning, became ***591 respondents.*** This was due to missing values, which will be explained in the proceeding sections.

3.3 Data Collection and Variable Measurement

Data collection was conducted through a structured questionnaire using **KoboToolbox**, a digital survey tool. To complement the study, semi-structured interviews were included in the survey for qualitative insights. This study includes both *independent* and *dependent variables* to assess the impact of the Igbo Apprenticeship System (IAS) on business outcomes, as outlined in *Tables 1, 2, 3, and 5 (see appendix)*. The **dependent variables** primarily measure business outcomes such as customer base growth, profitability, business size, and revenue increase. Key **independent variables** include demographic factors (e.g., age, gender, marital status and education level) and variables to capture family background and socioeconomic characteristics (e.g., parents educational level, family financial background and parents employment status).

To elaborate, the survey instrument had four key areas:

1. ***Section A** 'Demographic and socio-economic characteristics***:** Variables regarding the respondents (both treatment and control) and parents. These variables aimed to provide insights on the background of the respondents with a view to controlling pre-existing differences between those IAS and non-IAS respondents. *(see Table 1 in appendix)* for variables measurement Section A.
2. ***Section B** 'Participation in IAS':* This section, "Participation in IAS," was only for the treatment groups, both Current and Alumni. It asked questions regarding the experiences and perceptions of IAS. *(see Table 2 in appendix)*
3. ***Section C** 'Business-specific Variables':* This section captures the business-specific variables. The variables *business_profit_margin, business_revenue_increase, business_size_growth, rate of reinvestment of profit and business_expansion* will be used to capture business outcomes. *(see Table 3 in appendix)*
4. **Section D '***Mentorship, Training, and Capital':* This section has a dual approach, measuring the perceptions of the multi-component of the IAS from participants and as well as non-participants who could have gotten any of these components from other means. These variables will further give insight into the beneficial aspects of these three components to business success. *(see Table 1 in appendix)*

These variables will help the study evaluate these businesses based on smart[6] business decisions.

3.4 Data Cleaning

A major challenge arose during the data collection process, which took place in market settings. This environment often led to distractions, such as respondents being interrupted by customers entering their stores or deciding to drop out of the survey midway, treating the survey as distracting to their day's work, leading to some missing values. Furthermore, respondents were given the option to skip questions they considered too personal, such as those related to household income, business income, startup capital, or age, which resulted in a significant number of missing values as well. For the analysis, all observations with inconsistent or missing key variables regarding demographic & socioeconomic, and business variables were removed, and only those with complete responses were retained. This explains the reduction in sample size from the initial **822 to 591 respondents**, as only data points with relatively complete information were retained.

[6]**Smart business** here means how effective are the respondent's businesses in maximizing profit margins and employing best business practices like reinvesting profit for business growth and customer base growth

Next, the study verified that all variables were in the correct format, ensuring that categorical data was properly labelled, and numeric data was formatted correctly. Finally, it examined the dataset for outliers or irregularities and addressed any that could potentially skew the results, particularly from inputting errors. For example, in age, maybe instead of 34 years, 3e was inputted. All these irregularities were removed to keep only clear responses intact.

3.5 Ethical Considerations

This study adhered to *ethical research standards*, including obtaining *informed consent* from all participants. Participants were free to skip questions or withdraw from the study at any point, and confidentiality was maintained by anonymizing data.

4.0 EMPIRICAL STRATEGY AND DATA ANALYSIS

4.1 Justification for Dual Approach (PSM and IV)

The empirical strategy for this study begins with a simple Ordinary Least Squares (OLS) regression, where the dependent business outcomes (business growth, profit margin, revenue increase, customer growth, profit reinvestment, and business satisfaction) are regressed on IAS participation as an independent variable, controlling for various background characteristics to manage selection effects. However, relying solely on a linear approach could be limiting. Therefore, this study employs Propensity Score Matching (PSM) to match respondents with similar baseline characteristics (age, gender, education, parent's employment status, family background, and business variables) to conditionally compare IAS participants and non-participants based on these similarities.

Yet, while PSM addresses selection based on observable characteristics, it assumes that selection is purely driven by these observable factors. To account for unobserved influences, such as intrinsic abilities, the study further applies an Instrumental Variable (IV) approach to isolate the causal effect of IAS participation.

Using both PSM and IV cross-validates the findings, increasing their credibility. If results from both methods converge, it strengthens confidence in the conclusions. If discrepancies arise, it underscores the role of unobserved factors, offering more nuanced insights into the determinants of business success within the IAS framework. This multi-method strategy is designed to ensure, as far as possible, the identification of the causal effect of the IAS on business outcomes.

4.2 OLS, Instrumental Variable (IV) Specification and Propensity Score Matching (PSM)

4.2.1 OLS Estimation

First, a simple OLS was estimated to see how each independent variable influences the outcome while controlling for the others. This will help identify statistically significant factors affecting the outcome of interest.

Equation 1: OLS model 1

$$Y_{busi\_outcome} = \alpha + \beta_{1IAS} + \beta_{2Demo-socio} + \beta_{3iBusi\_variables} + \beta_{4i} \ldots + \varepsilon_i$$

Where:

- $Y_{busi\_outcome}$ = captured in percentages by profit margin, customer base growth, rate of reinvestment of profits, business growth in scale, and revenue.
- α = coefficient capturing the control group
- β_{1IAS} = IAS participant
- $\beta_{4Demo-socio}$ = age, education, gender, marital status, household income, parent's income level, employment, education, and housing location
- β_{5i} = controlling for other variables affecting business outcome
- ε_i = error term

Equation 2: OLS model 2

$$Y_{busi\_outcome} = \alpha + \beta_{1Mentorship} + \beta_{2training} + \beta_{3settlement} + \beta_{4Demo-socio} + \beta_{5iBusi\_variables} \ldots + \varepsilon_i$$

$\beta_{5iBusi\_variables}$= business sector, size, and years of operation

4.2.2 Estimating the Propensity Score

First, using a probit model, we estimated the *propensity score*, the probability of an individual participating in IAS based on observed covariates.

Equation 3: Probit model

$$P(\mathrm{IAS}_i = 1 \mid X_i) = F(\alpha + \beta_1 \mathrm{X}_{1i} + \beta_2 \mathrm{X}_{2i} + \ldots + \beta_k \mathrm{X}_{ki})$$

Where:

- $P(\text{IAS}_i = 1)$ is the probability of participation Treatment=1 and control=0
- *F(.)* is the cumulative distribution function

- X_{1i}, X_{2i}, …X_{ki} represent the observable characteristics (such as age, education, gender, marital status, household income, parent's employment, education, and parents housing location & ownership, parent's primary source of income and family receiving welfare assistance) that affect participation.

After the propensity scores were estimated, participants were matched to non-participants using nearest-neighbor matching technique. The matched sample ensures that observable characteristics between participants and non-participants are balanced, thus reducing selection bias. The **average treatment effect on the treated (ATT)** was estimated.

Equation 4: ATT model

$$ATT = \frac{1}{N_t} \sum_{i \in T} \left(Y_i^{\text{IAS}} - \sum_{j \in C} w_{ij} Y_j^{\text{Non-IAS}} \right)$$

Where:

- N_t is the number of treated (IAS participants).
- Y_i^{IAS} is the outcome for treated individuals.
- $Y_j^{Non\text{-}IAS}$ is the outcome for the matched control individuals (non-participants).
- W_{ij} are the matching weights applied to control group members.

This method isolates the effect of IAS participation by controlling for observable factors.

4.2.3 Estimating the Instrumental Variable (IV) using 2SLS

In this case, the participation of family or relatives in IAS before participation and the number of co-apprentices during IAS were tested for validity instruments. This assumes proximity increases the likelihood of participation but does not directly affect business outcomes. An exclusion restriction test was first performed to determine validity.

First-Stage Regression
The first stage of the IV estimation models the probability of participating in IAS using the instrument:

Equation 5: IV first-stage regression model

$$\text{IAS}_i = \alpha_0 + \alpha_1 \text{Instrument}_i + \alpha_2 \text{X}_{1i} + ... + \alpha_k \text{X}_{ki} + \epsilon_i$$

Where:

- IAS_i is a binary variable indicating whether individual i participated in IAS.
- Instrument_i is the instrumental variable (distance to mentor/apprenticeship clusters).
- $X_{1i}, X_{2i}, ...X_{ki}$ are control variables (observable factors like education, age, initial business size).

Second-Stage Regression

Equation 6: IV Second-stage regression model

$$Y_i = \beta_0 + \beta_1 \hat{\text{IAS}}_i + \beta_2 X_{1i} + ... + \beta_k X_{ki} + \nu_i$$

Where:

- Y_i is the business outcome (e.g., income, profit, business growth).
- $\hat{\text{IAS}}_i$ is the predicted value of IAS participation from the first-stage regression.
- $X_{1i}, X_{2i}, ...X_{ki}$ are the same control variables used in the first stage.

4.2.5 Potential Bias

The identified biases of this research include the following:

1. **Spillover Effect**: Some control group members are family members of IAS participants[7], potentially leading to indirect exposure and benefits, thus creating a spillover effect.
2. **Error in Data Measurement**: Personal data like income were particularly prone to measurement error, as many respondents were skeptical about disclosing income and may have provided estimated or average figures that do not accurately reflect their actual earnings.

[7] From the data collected, 26 out of the 167 female respondents identified as IAS participants. After further investigation, it was observed that most of these females are either wives or sisters of IAS participants who benefited from the three components, though through different means other than being official IAS participants. This insight is useful for a gender analysis of the 26 pseudo-IAS participants and the remaining 141 females in the control group.

5.0 RESULT AND DISCUSSION

5.1 Descriptive Statistics of Respondents

Table 5: Composition of Sample Treatment and Control Groups

Sample	Definition	Group	Observation N
IAS Participant	Business owners who graduated from the IAS	Treatment	282
Non- Participants	Business owners who did not participate in IAS	Control	309
		Total Sample	591

Table 5 shows the sample for this study comprises two main groups: IAS participants and non-participants, totalling 591 observations. The treatment group, which includes 282 observations, consists of business owners who graduated from the Igbo Apprenticeship System (IAS). These participants represent individuals who have completed the IAS training and are expected to reflect the system's impact on business outcomes. The control group, with 309 observations, includes business owners who did not participate in the IAS.

Table 6: Summary Statistics showing Demographic and Socio-economic Characteristics of IAS Participants vs non-participants[8]

Variables	Total Sample Mean(N=591)	IAS Participants Mean(N=282)	Non-Participants Mean(N=309)	Min	Max
Age of Respondent	37.32 (0.39)	38.18 (0.60)	36.53 (0.49)	18	72
Gender of Respondent	0.72 (0.02)	0.90 (0.02)	0.55 (0.03)	0	1
Marital Status	0.40 (0.02)	0.41 (0.03)	0.39 (0.03)	0	1
Education Respondent	2.24 (0.02)	2.07 (0.03)	2.39 (0.03)	1	3
Education Parents	1.89 (0.03)	1.77 (0.04)	2.00 (0.04)	1	3
Employment Father	0.77 (0.02)	0.76 (0.03)	0.79 (0.02)	0	1
Employment Mother	0.78 (0.02)	0.75 (0.03)	0.80 (0.02)	0	1
Family Primary Income (parents)	0.76 (0.02)	0.83 (0.02)	0.693 (0.03)	0	1
Location of Family housing	0.382 (0.03)	0.52 (0.04)	0.26 (0.04)	0	1
Ownership of Family House	0.472 (0.03)	0.52 (0.04)	0.427 (0.04)	0	1
Family Received welfare Assistance	0.39 (0.02)	0.471 (0.03)	0.328 (0.03)	0	1
Estimated income (NGN)	163,628.5 (10,527.3)	169,366.8 (18,616.8)	158,391.6 (10,890.4)	10,000	500,000

**Values in parentheses are standard errors.*
Source: Authors sample data

[8] All ordinal variables are treated as "dummy variables 1 and 0" except for Education and primary source of income in order to show more nuance in their characteristics. The household income 10000/150000 = 1 "Low Income" 151,000/300000 = 2 "Middle Income" 300001/50000000 = 3 "High Income". The statistical tables and charts showing the variables' percentage values are attached in Appendix B

In *Table 6,* the demographic and socio-economic characteristics of the respondents are presented, revealing notable patterns within the sample. The average respondent *age* is 37.31 years, with a standard deviation of 9.36, indicating a diverse age range from 17 to 72 years. IAS participants tend to be slightly older, with an average age of 38.18 years compared to 36.53 years for non-participants. Possibly reflecting a greater inclination among older individuals to pursue the IAS due to life experience or economic motivations.

In terms of *gender* distribution (where 1 indicates male and 0 indicates female), the sample is predominantly male, with a mean value of 0.72, signifying that 72% of the respondents are men. This gender imbalance is even more pronounced within the IAS group, where 90% are male, compared to 55% among non-participants. This pattern could reflect cultural or structural factors that make the IAS more accessible for men.

For *marital status* (coded as 1 for married and 0 for others), the data shows consistency across both groups, with approximately 40% of respondents married. There is minimal variation between IAS participants (41%) and non-participants (39%), indicating a balanced representation of marital status, with the rest being single, divorced, or widowed.

Educational attainment is measured on a scale where 1 represents primary school, 2 secondary school, and 3 tertiary education. The overall sample has an average educational level of 2.24, indicating that most respondents have at least completed primary or secondary education. However, IAS participants report a lower average education level (2.07) than non-participants (2.39), with 83% of IAS participants having primary or secondary education, compared to 57% of non-participants. This suggests that individuals with less formal education might be more inclined to participate in the apprenticeship program, viewing it as a viable alternative for economic advancement.

A similar trend is observed in *parental education levels,* which use the same coding as the respondents' education levels. The total sample average for parental education is 1.89, with IAS participants showing a slightly lower mean (1.77) compared to non-participants (2.00). Approximately 82% of respondents' parents have only primary or secondary education. Among IAS participants, 41% of parents have primary education and 42% secondary, whereas non-participants' parents have 20% primary and 60% secondary education. This indicates that IAS participants are more likely to come from families with lower educational backgrounds. *Parental employment type*, coded as 1 for self-employed and 0 for other types of formal employment, shows a strong prevalence of self-employment among both IAS and non-participant groups. For IAS participants, 76% of fathers and 75% of mothers are self-employed. This trend is slightly higher among non-participants, where 79% of fathers and 80% of mothers are self-employed. Notably, the mothers of non-participants tend to have higher educational levels than those of IAS participants, but generally, the similarities indicate that parental employment type is relatively uniform across both groups.

Regarding *Family Primary Income* (coded as 1 for small trade or farming and 0 for larger-scale trade or other significant income sources), 76% of respondents come from families involved in small-scale trade or farming. This trend is more pronounced among IAS participants, with 83% having parents in SMEs, compared to 69% for non-participants. This higher representation of SME backgrounds among IAS participants may indicate that the IAS are more likely to come from modest economic background, whereas non-participants are more likely to have families involved in full-time employment or big business.

For the *Location of Family(parents),* where 1 represents rural areas, and 0 represents urban or other locations, the data reveals that 38% of respondents' families are located in rural areas. IAS participants show a higher proportion of rural family locations, with 52% having parents in rural areas at the time they joined the IAS. In contrast, only 26% of non-participants have parents in rural areas. This urban-rural difference may indicate that IAS has stronger participation from those whose parents were based in rural areas as at the time they joined IAS. The *Ownership of Family House (parents),* coded as 1 for owned homes and 0 for rental or other arrangements, shows that 47% of the total sample's families own their homes. Among IAS participants, homeownership is even higher, with 52.5% owning their homes compared to 42.7% of non-participants. This rural dwelling trend may explain the higher homeownership rate among IAS participants, as rural residents are generally more likely to own their homes than urban residents.

Family Received Welfare Assistance, where 1 indicates families who received assistance, and 0 indicates those who did not; the total sample shows that 39.2% of respondents have received welfare assistance. IAS participants are more likely to have received external assistance, with 47.1% of them indicating welfare support compared to 32.8% of non-participants. This finding suggests that IAS participants may come from slightly more disadvantaged backgrounds, with a higher likelihood of requiring external support to sustain their households.

In terms of *Estimated income* [9], the sample shows that on average, respondents get ₦163,626 while the IAS respondents on average stated ₦169,366.8 and the non-participants ₦158,391.6. This shows that the majority of respondents fall within lower-income earners. This income distribution emphasizes a significant concentration of lower-income households within the sample.

5.2 Multicomponent Rating by IAS Participants

This section presents the perceived impact of various IAS components on business success, as rated by participants. Table 3 summarizes these ratings, showing how participants prioritized mentorship, training, financial support, market orientation, and customer acquisition as influential factors in their business growth.

Table 7: Summary Multi-Component Rating

Components	1st Choice Rating	2nd Choice Rating	3rd Choice Rating	4th Choice Rating	5th Choice Rating
Mentorship	**125 (44.33%)**	50 (17.73%)	27 (9.57%)	32 (11.35%)	45 (15.96%)
Knowledge and Training	70 (24.82%)	75 (26.60%)	**102 (36.17%)**	18 (6.38%)	17 (6.03%)
Cash/goods Settlement	75 (26.60%)	**100 (35.46%)**	35 (12.41%)	36 (12.77%)	55 (20.21%)
Market Orientation	12 (4.26%)	43 (15.25%)	81 (28.72%)	35 (12.41%)	**101 (35.82%)**
Ease of Customer Acquisition		14 (4.96%)	37 (13.12%)	**161 (57.09%)**	61 (21.63%)
N	282	282	282	282	279

[9] As earlier stated, there is expected to be a lot of bias in the estimated income as a lot of respondents were not comfortable disclosing actual amounts, this heavily skewed the results to make tangible conclusions from the variable

Table 7 in line with the components of IAS identified from the literature review, Mentorship emerged as the top-rated component, with 44.33% of participants selecting it as their first choice, highlighting its crucial role in supporting business success through guidance. Knowledge and Training was also seen as essential, particularly for sustained growth, with the highest rating as a third choice (36.17%), indicating it is valued but considered secondary to mentorship and financial support. Cash Settlement ranked highly as a second choice (35.46%), underscoring the importance of initial financial support in helping participants start and stabilize their businesses. Market Orientation was generally rated lower, with 35.82% marking it as a fifth choice, suggesting it is beneficial but less immediately critical than other components. Ease of Customer Acquisition was primarily selected as the fourth choice (57.09%), indicating that building a customer base is important but follows the foundational elements of mentorship and financial support. These ratings illustrate the multi-faceted nature of IAS, where mentorship, training, and financial support work together to drive participant success, with mentorship being the most valued component. Based on these findings, this shows that all IAS participants indicate access to these three main components: mentorship, Training, and Funding from either cash/goods settlement.

5.3.1 Probability of being in the IAS

Table 8: Probability of Being an IAS Participant

Variable	Probability (dy/dx)	OLS
Gender of Respondent	**0.4321***** (0.0444)	**0.3988***** (0.0418)
*Education of Respondent(secondary)**	-0.0285 (0.1056)	-0.0403 (0.0804)
*Education of Respondent(tertiary)**	**-0.2722**** (0.1036)	**-0.2253***** (0.0885)
*Education of Parents(primary)**	0.058 (0.0402)	-0.0315 (0.0603)
*Education of Parents(secondary)**	-0.0761 (0.103)	**-0.1096**** (0.0509)
Employment of Father	0.0324 (0.07413)	0.0178 (0.0561)
Employment of Mother	-0.1094 (0.07377)	**-0.0905*** (0.0546)
Family Primary Income (parents)	0.06354 (0.06107)	0.0182 (0.0464)
*Location of Family House (parents)**	**0.2676***** (0.0547)	0.1985 (0.0450)
Ownership of Family House (parents)	0.0540 (0.0511)	0.0459 (0.0397)
Family Received Assistance (parents)	**-0.2323***** (0.0461)	-0.1775 (0.0372)
Participation of Family before IAS	-	.6691***** (.0239)
Financial condition of family	-	.3111***** (.0248)
cons	-	0.4725***** 0.1505

(*) dy/dx is for discrete change of dummy variable from 0 to 1.
Values in parentheses are standard errors.
Note: Asterisks indicate significance levels: *** p < 0.01, ** p < 0.05, * p < 0.1

From *Table 8* above, the probability of participating in the IAS is influenced by several demographic and socioeconomic factors, as revealed by the marginal effects from the probit regression analysis. *Gender* plays a significant role, showing that, on average, males are **43.2% significantly more likely** to participate in the IAS compared to females, holding other factors constant. *Education* also impacts participation in the IAS, as individuals with higher education levels are **27% less likely** to join than those with only primary education. This also applies to the parents; although the coefficient is not significant, the sign indicates the direction of the effect, which is that, on average, less educated parents are **5.8%** more likely to send their children to the system compared to those with tertiary school education. Furthermore, *family housing location* is a critical factor; the more the parents' locations are in rural locations, the **26.7% more likely** they are to participate in IAS compared to those respondents whose parents lived in urban areas before they joined IAS. Additionally, those from families that did not receive social assistance are **23.41% less likely** to participate in the IAS on average compared to those who receive more assistance. Variables such as **parental employment, ownership of family housing, and family's primary source of income** do not have a statistically significant effect on participation.

5.3.2 Review of IAS: Motivation & Nature

Table 9: Summary of IAS: Characteristics, Nature and Effects[10]

Variable	Mean	Min	Max
Primary Motivation for joining IAS	.5996 (0.029)	0	1
Financial condition of family before joining IAS	.8040 (0.023)	0	1
Length of ias	6.25 (0.126)	1	15
Potential_customers after IAS	.7978 (0.0402)	0	1
Perceived Impact_rate of IAS on business	.6099 (0.028)	0	1
Overall_living conditions of housing during IAS	.3900 (0.49)	0	1
Number_of_Coapprentices	3.138 (0.10)	0	15
Confidence_level	0.5177 (0.575)	0	1
Recommend_ias	.7059 (0.025)	0	1
Strength of recommendation	.9752 (0.0093)		
Sibling_sponsorship	0.765 (0.026)	0	1
Employed_apprentices	0.751269 (0.858)	0	1
No of employed apprentices	1.19 (0.037)	0	6
Female_adaptation_IAS	0.5708 (0.029)	0	1
Female_empowerment_impact	.7420 (0.025)	0	1
Participation_after_IAS	.567 (0.029)	0	1
Awareness_success_IAS	.6666 (0.0281)	0	1
N	282		

a. Who Participates in IAS and Why?

From *Table 9,* the primary motivation for joining IAS differs across participants. For **59.9%**, the primary reason was '**necessity**,' reflecting a need to find financial stability or escape poverty compared to **others** who were motivated by **opportunity or interest**, indicating that for many, IAS represents a chance to learn and pursue entrepreneurial goals in the midst of a lack of formal employment for most youths' in the country. This mix of motivations highlights a dual role of IAS as both a survival mechanism and a pathway to self-improvement through business.

[10] The observation is 282 as these questions was only addressed to IAS participants in section B.

Participants typically come from **80.4%** of families who considered themselves "poor" at the time of the participant's entry into IAS, indicating that a large portion of the cohort joined out of need for financial improvement. Participants spend an average of **6.26 years** in the apprenticeship program, with durations ranging from **1 to 15 years** (this depends greatly on the age at which the participant joins). 61% perceive the living conditions during the apprenticeship as generally **good**, while 39% perceive the conditions as **poor**. The average number of co-apprentices that participants worked alongside during training is **3**, with some training alone and others working with as many as **15 co-apprentices**.

A significant majority of respondents, **67%**, reported that before they joined IAS, they knew a relative, friend, or family member who had participated in the IAS system, compared to those who indicated that their families had no prior involvement. After the respondents themselves joined the IAS, family or relative participation was **79%**, compared to others who reported no further family participation. This varied result aligns with the earlier findings, which are that the relatives usually learn from their relatives who have participated in IAS, and some might not particularly regard this training from their relative as being an apprentice in IAS while others do, the wives particularly as noted from the sample data which has **26 women** who identified as IAS participants.

b. Perceived Impact, Limitations, and Recommendations.

61.0% of participants perceive the IAS as having a high or significant impact on their business success compared to those who indicated moderate or no impact. suggesting that for many, IAS plays a crucial role in increasing their business capabilities. Among the participants, **76.50%** currently sponsor a sibling or relative in school, compared to others who do not. This high rate of sibling sponsorship highlights the significant role that IAS participants play in supporting the education of their extended families, suggesting that their involvement in the apprenticeship system not only benefits their own economic standing but also contributes to the educational advancement of their family members.

79.7% of IAS participants indicated that they had a potential customer after completion of the apprenticeship, compared to those who indicated they had no potential customer. This suggests that, on average, IAS participants perceive a positive impact as contributing to a consistent customer base. After completing the apprenticeship, 52% of participants feel confident to start their own businesses, while others express doubts. **30%** of the participants stated that they would not recommend the IAS to their family due to harsh conditions or experiences from 'bad bosses,' who reaped off some participants by not settling them at the end of the apprenticeship, which they strongly recommended a formalized and legal contract to bind the bosses to the agreement. Some recorded experiences where they were mistreated by the Boss's wives and even sexually harassed by some of them. Others highlighted that the length of training was too long and there should be an increment in the settlement amount. Still, the overall perception of IAS remains positive, with **70.6%** of participants stating they would recommend the system to family relatives, saying the system "makes men." Some said the system is not for the weak and is meant to prepare you to survive in life.

However, when asked about the strength of recommendation, data indicated that while most participants are satisfied with their experience, they may not feel strongly compelled to advocate for the system to their family as it is; when asked why? they mentioned that they already went through the system and their children or relatives can learn the trade from them; some mentioned that now they have made the money needed, their children can focus on attaining higher education

and better opportunities. Others emphasized the earlier suggestions: "reduction of the length of years, increment of the value of the settlement, introduction of a formal structure and legal contract.

The data reveals that **57.09%** of respondents believe there should be a female adaptation of the IAS, ensuring that women can access the same benefits as their male counterparts. However, **42.91%** do not agree with such an adaptation. Qualitative responses suggest that some participants view the system as inherently unsuitable for women, citing that it is not structured to accommodate their needs. Concerns were also raised about the risks of pairing women with male mentors, particularly due to the close living arrangements, which could potentially lead to sexual harassment. Others feel that the system has not yet evolved to be fully inclusive, and some recommend developing a separate program tailored specifically for women entrepreneurs.

In terms of the impact of female economic empowerment, **74.2%** of respondents agree that women tend to reinvest their economic gains more into their households, particularly benefiting their children. Meanwhile, **25.18%** of respondents do not observe the same level of impact, likely based on their personal experiences or varying perspectives on how women utilize their economic resources.

5.4 Business Characteristics of Respondents

Table 10: Business Characteristics of Respondents (Standard error in Parenthesis)

Variables	Total (N=591)	IAS Participants (N=282)	Non-Participants (N=309)	Min	Max
Business Sector	.379	.471	.290	0	1
	(0.02)	(0.03)	(0.03)		
Business Size	2.33	2.33	2.32	1	8
(employees)	(0.07)	(0.10)	(0.10)		
Monthly Income	472,518.1	499,517.7	448,430.4	10000	5000000
(NGN)	(28,936.9)	(33,604.3)	(32,372.5		
Years in Business	8.69	9.67	7.81	1	50
	(0.29)	(0.47)	(0.34)		
Registered with CAC	.247	.223	.271	0	1
	(0.02)	(0.02)	(0.03)		
Primary Source of	-	.765	-	0	1
Capital		(0.03)			
Total start up capital	.221	.305	.145	0	1
	(0.024)	(0.0275)	(0.0201)		
Used Business Loans	*.3153457*	*.3439*	*.2912*	0	1
	(0.025)	*(0.025)*	*(0.029)*		
Access to credit	*.1264755*	*.1170*	*.1359*	0	1
	(0.019)	*(0.010)*	*(0.017)*		

Source: Authors sample data

Table 10 compares business characteristics across respondent groups, highlighting a retail-focused economy. Retail businesses, encompassing essential goods like food, clothing, pharmaceuticals, and electrical appliances, dominate the sample, making up 61.9% of all businesses. Wholesale businesses, covering sectors such as textiles, beverages, computers, and household goods, account for the remaining 38.1%. This distribution emphasizes the prevalence of retail activities. Business size, measured by employee count, averages around 2.33 for both groups, indicating that most businesses are small to medium-sized regardless of IAS involvement. According to the sample, IAS participants, on average, have generally been slightly longer in business, averaging 9.67 years compared to 7.81 years for non-participants. The average monthly business income is ₦472,807,

with retail businesses ranging from ₦10,000 to ₦499,999, while wholesale businesses fall between ₦500,000 and the sample's maximum of ₦5,000,000.

In terms of formal registration with the Corporate Affairs Commission (CAC), on average only 22.3% of IAS participants owned businesses are registered compared to a large 77.7% that is not registered. This is also similar for non-participants, with only 27% of businesses registered, suggesting that most businesses in the study are informal and unregistered. 22.1% of the total sample indicated having a total start-up capital of Less than N1,000,000 compared to having above N1,000,000. On average, 30.5% of IAS participants reported having start-up capital less than N1,000,000 compared to 14.5% for non-participants where majority of their start-up capital are from N1,000,000 – N5,000,000 or more.

For the primary source of capital, 76.5% of IAS participants indicated a greater reliance on cash or goods settlements compared to non-participants, who more often secure external funding sources such as personal loans, support from friends, or bank loans. This contrast in funding sources between IAS participants and non-participants highlights yet another significant predictor for the trend in the nature and background of IAS participants. Many rely on the cash/goods settlement as a source of business capital, which again can be reflected in their parent's financial condition before they joined IAS. This variation suggests a key motivation for IAS participants to join the system as a means to raise funds to start their businesses, as there are limited alternatives. The study also found that only 32% of the respondents have used formal business loans compared to those who indicated they had not gotten business loans from banks, with 34% being IAS participants, slightly more than the 29% of non-participants. For access to credit in terms of ease or difficulty, only 12% of the total sample indicated ease of accessing credit, 11.7% and 13.5% for participants and non-participants. These results show that generally, the study sample, who are notably informal economy, hardly have used formal loans and also have difficulty in accessing credit, this also coincides with the lack of registration as this is usually the basic requirement for accessing formal loans.

5.4.2 Descriptive Statistics of Business Outcome Variable

Table 11: Summary of Business Outcome Variables *(Standard error in Parenthesis)*

Variable	**Total Respondents Mean(Obs=591)**	**IAS Participants Mean(Obs=282)**	**Non-Participants Mean(Obs=309)**
Profit Margin	2.145 (0.028)	2.248 (0.030)	2.052 (0.045)
Growth	3.750 (0.024)	3.787 (0.036)	3.715 (0.033)
Revenue Increase	2.739 (0.049)	2.879 (0.066)	2.612 (0.072)
Reinvest Profits	2.242 (0.025)	2.287 (0.035)	2.201 (0.034)
Customer Growth	3.320 (0.029)	3.450 (0.041)	3.201 (0.039)
Primary Capital	2.535 (0.025)	2.280 (0.028)	2.767 (0.037)

Table 11 shows that in the **profit margin outcome**, IAS participants report a slightly higher average margin (2.248) corresponding to a range of ***10%-20%,*** compared to non-participants (2.052), who fall within a similar range. **Business growth**, measured by the change in business scale since inception, shows yet a slightly stronger expansion among IAS participants, with an average growth

rate of 3.787, falling between "*Larger" and "Significantly larger*." Non-participants have a slightly lower growth rate, averaging 3.715, indicating that IAS experience may be associated with greater business expansion. The average **revenue increase** for IAS participants is 2.879, indicating a ***10%-20%*** increase over the past year, while non-participants report an average increase of 2.612. For **reinvestment of profits**, IAS participants report an average reinvestment level of 2.287, which falls between "Occasionally" and "Regularly." Non-participants, with an average of 2.201, report a slightly lower reinvestment rate. In terms of **customer base growth**, IAS participants have an average growth rate of 3.450, indicating "*Moderate to Fast Growth*," while non-participants average 3.201, suggesting a slightly slower expansion. This difference may reflect the additional market linkages and exposure provided to IAS participants during the years of training in the system.

5.5 OLS Estimations of Business Outcome Variables

Table 12: OLS Estimation of Business Outcomes

Independent	**Dependent Variables (Business Outcomes)**						
Variables	**Business Profit Margin**	**Business Growth**	**Customer Growth**	**Revenue Increase**	**Profit Reinvestment**	**Business Satisfaction**	**Business Expansion**
IAS Respondent Group	0.278 (0.058)***	0.050 (0.056)	0.287 (0.063)***	0.537 (0.102)***	0.127 (0.056)**	0.239*** (0.067)	-0.059 (0.046)
Business Sector	-0.133 (0.053)**	0.050 (0.051)	0.012 (0.057)	-0.272 (0.092)***	-0.015 (0.051)	0.066 (0.061)	0.026 (0.042)
Age of Respondent	0.005 (0.004)	0.002 (0.003)	-0.006 (0.004)	0.005 (0.006)	-0.006 (0.003)*	-0.011*** (0.004)	-0.005 (0.003)*
Gender of Respondent	-0.134 (0.063)**	0.041 (0.061)	-0.050 (0.068)	-0.251 (0.110)**	-0.091 (0.061)	0.099 (0.072)	-0.041 (0.050)
Marital Status of Respondent	0.033 (0.065)	-0.127 (0.063)**	-0.098 (0.071)	0.087 (0.114)	-0.037 (0.063)	-0.227*** (0.075)	0.109 (0.052)**
Education of Respondent	0.017 (0.054)	0.035 (0.052)	-0.030 (0.059)	0.184 (0.094)*	-0.057 (0.052)	0.003 (0.062)	-0.007 (0.043)
Education of Parents	0.025 (0.043)	0.003 (0.041)	-0.060 (0.046)	0.099 (0.074)	-0.134 (0.041)***	-0.048 (0.049)	-0.032 (0.034)
Employment Status of Father	0.001 (0.078)	0.008 (0.076)	-0.054 (0.085)	0.107 (0.136)	0.121 (0.076)	0.122 (0.089)	0.003 (0.062)
Employment Status of Mother	-0.013 (0.077)	-0.056 (0.074)	0.011 (0.083)	-0.054 (0.134)	0.119 (0.074)	-0.091 (0.088)	0.044 (0.061)
Primary Source of Family Income	-0.063 (0.065)	0.082 (0.063)	-0.152 (0.070)**	-0.282 (0.113)**	-0.070 (0.063)	-0.127* (0.074)	0.124 (0.052)**
Location of Family House	-0.127 (0.041)***	-0.055 (0.039)	-0.064 (0.044),	-0.089 (0.071)	0.086 (0.039)**	-0.044 (0.047)	-0.026 (0.032)
Ownership of Family House	-0.166 (0.040)***	0.034 (0.039)	-0.158 (0.043)***	-0.434*** (0.070)	-0.095 (0.039)**	-0.063 (0.046)	0.080 (0.032)**
Family Received Assistance	-0.079 (0.053)	0.023 (0.052)	-0.036 (0.058)	-0.114 (0.093)	-0.060 (0.052)	0.092 (0.061)	-0.033 (0.042)
Access to Basic Amenities	-0.124 (0.053)**	0.034 (0.051)	-0.063 (0.058)	-0.123 (0.093)	-0.008 (0.051)	0.004 (0.061)	0.091 (0.042)**
Access to Credit	0.146*** (0.027)	0.081*** (0.026)	0.112*** (0.029)	0.322*** (0.046)	0.010 (0.026)	0.017 (0.030)	-0.052** (0.021)
Registered Business with CAC	-0.222 (0.061)***	-0.092 (0.059)	-0.262 (0.067)***	0.009 (0.107)	-0.170 (0.059)***	0.077 (0.070)	0.098 (0.049)**
Constant	2.939*** (0.309)	3.325*** (0.300)	4.625*** (0.336)	3.058*** (0.541)	3.194*** (0.300)	4.296*** (0.354)	1.313*** (0.246)
N	591	591	591	591	591	591	591

Standard error in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The Ordinary Least Squares (OLS) estimation of business outcomes in *Table 12* reveals that IAS participation significantly enhances some key business metrics, with IAS participants outperforming non-participants across various dimensions. For **Business Profit margin**[11], findings suggest that, on average, IAS participants report profit margins that are **0.278** points higher than non-participants, holding other factors constant (significant at the 1% level, with a standard error of 0.058). This indicates that the mentorship, skill transfer, and resource-sharing elements inherent in the IAS model contribute to participants achieving higher profit margins.

Business Growth[12], IAS participants show a coefficient of **0.050** compared to non-participants, but this difference is not statistically significant (standard error = 0.056). This result suggests that IAS participation alone does not drive substantial growth in business size or scale when compared with non-participants. While IAS may enhance profitability and other outcomes, the growth of a business might rely on external factors, such as industry-specific dynamics, market conditions, or access to additional capital, which are not directly provided through the IAS model.

Customer Base Growth[13], The results show that IAS participants experience a **0.287** increase in customer base growth compared to non-participants, holding other factors constant, with a standard error of 0.063 (significant at the 1% level). This aligns with the earlier findings, which showed that 79% of the participants had potential customers before they started their business. This suggests that the years of exposure to the real life market scenarios and the constant practice of customer-building skills and acquisition strategies would have contributed to the expansion of their customer base more effectively than their non-participating counterparts.

Revenue Increase[14] , IAS participation is associated with a **0.537** point increase in revenue growth relative to non-participants, a statistically significant result at the 1% level (standard error = 0.102) on average. This finding suggests that IAS-trained entrepreneurs may be better positioned to enhance their revenue compared to those who have not received similar support.

Profit Reinvestment[15], the IAS respondent group reports an average increase of **0.127** points in the rate of reinvesting profits into their business compared to non-participants, which is significant at the 5% level (standard error = 0.056). This indicates that IAS participants are more inclined to reinvest their profits, which may be attributed to more strategic financial literacy or simply an adaptation due to the lack of alternative pathways to access credit and loans, as shown in the study.

Business Satisfaction[16], the positive coefficient of **0.239** for IAS participants on average, significant at the 1% level (standard error = 0.067), suggests that IAS participants are more likely to report higher satisfaction with their business performance than non-participants. This heightened satisfaction could stem from the psychological and emotional growth through years of exposure in the market scenarios through IAS.

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[11] **Business Profit**: (coded as an ordinal variable: 1 = "Less than 10%", 2 = "10%-20%", 3 = "20%-30%", 4 = "30%-40%", 5 = "More than 40%"

[12] **Business Growth**: (coded as an ordinal variable: 1 = "Significantly smaller", 2 = "Smaller", 3 = "The same", 4 = "Larger", 5 = "Significantly larger")

[13] **Customer Base Growth**: (coded as an ordinal variable: 1 = "No growth", 2 = "Slow growth", 3 = "Moderate growth", 4 = "Fast growth", 5 = "Very fast growth")

[14] **Revenue Increase**: (coded as an ordinal variable: 1 = "No increase", 2 = "Less than 10%", 3 = "10%-20%", 4 = "20%-50%", 5 = "More than 50%").

[15] **Profit Reinvestment** (coded as an ordinal variable: 1 = "Never", 2 = "Occasionally", 3 = "Regularly", 4 = "Frequently", 5 = "Always").

[16] **Business Satisfaction** (coded as an ordinal variable: 1 = "Satisfied", 2 = "Not satisfied").

However, for **Business Expansion,** which reflected if the respondents have expanded their business since inception or not, showed to be statistically insignificant, with coefficients of -0.059, respectively, suggesting no measurable difference between IAS participants and non-participants in these areas. These results indicate that while IAS participation contributes substantially to profitability, customer growth, revenue increase, reinvestment, and satisfaction, it does not appear to influence the scalability or expansion of business operations. To further verify these values, the research goes on to test for robustness by further employing Instrumental variable (IV) and, finally, Propensity score matching (PSM) by matching respondent groups on baseline characteristics (demographic and socio-economic, respondents, family background, and business sectors).

5.6 IV Estimation

Identified valid instruments from the data collected are the variables '*if a family member or relative had prior participation in IAS and if they were aware of successful IAS participants before they joined*', which influences the respondent's likelihood of joining IAS but has no direct effect on the business outcomes[17]. This instrumental variable leverages the influence of family exposure to IAS on participation decisions while remaining exogenous to business performance metrics, ensuring it satisfies the relevance and exclusion criteria essential for robust IV estimation.

5.6.1 IV first stage regression

$$Y_{\text{IAS participant}} = \alpha + \beta_{1\text{part\_fam\_bef\_IAS}} + \beta_{2\text{Demo-socio}} + \beta_{3\text{iB}usi\_variables} + \beta_{4\text{i}} \ldots + \varepsilon_{\text{i}}$$

$$Y_{\text{IAS participant}} = \alpha + \beta_{1\text{aware\_success\_IAS}} + \beta_{2\text{Demo-socio}} + \beta_{3\text{iB}usi\_variables} + \beta_{4\text{i}} \ldots + \varepsilon_{\text{i}}$$

Table 13a: IV Validation test: First-stage regressions

Instrument	First Stage coef. (OLS)
IAS Participant (Part_Fam_bef_IAS)	.5357*** (t=30.69)
IAS Participant (aware_success_ias)	.2460*** (t=17.52)
Business Profit Margin (aware_success_ias)	.0452 (t=0.54)
Customer Growth (Part_Fam_bef_IAS)	-.1275 (t=-1.45)
Revenue Increase (Part_Fam_bef_IAS)	.1752 (t=1.17)
Business Satisfaction (aware_success_ias)	.0031 (t=0.04)
Profit Reinvestment (Part_Fam_bef_IAS)	.0408 (t=0.89)

T statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[17] Refer to *Table 8* and *Table 13a* showing significant coefficients from a Probit and OLS estimations.

From *Table 13*a, it can be seen that in the first stage regression, both variables Part_Fam_bef_IAS and aware_success_ias had significant effects on average for IAS participants at .308 increase and .2602 increase respectively at a 1% significant level, holding other factors constant. These variables also show to have no significant effect on the business outcomes. Hence, the study proceeds to use the predicted value for the IV estimations.

IV Estimations Summary: 2SLS

Table 13b: Comparative test: OLS and IV

Business Outcomes	OLS Estimation (IAS)	Instrumental Variable Estimation (IV)
Business Profit Margin	0.2779 (0.0581)***	0.2414 (0.0622)***
Customer Growth	0.2868 (0.0632)***	0.2189 (0.0669)***
Revenue Increase	0.5374 (0.1017)***	0.5276 (0.0110)***
Business Satisfaction	0.2386 (0.0666)***	0.2007 (0.0689)**
Profit Reinvestment	0.1276 (0.0563)**	0.0554 (0.0585)

Standard error in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 13b compares OLS and Instrumental Variable (IV) estimations to assess the robustness of IAS participation's average effect on various business outcomes while holding other factors constant. For *business profit margin*, the OLS estimation shows a ***.2779*** increase for IAS participants, which slightly decreases to ***.2414*** in the IV model, both highly significant at 1% level. Similarly, *customer growth* shows a ***.2868*** increase in OLS and a robust ***.2189*** in IV, both significant at the 1% level. *Revenue increase* demonstrates a substantial positive effect, with a ***.5374*** increase in OLS and ***.5276*** in IV, maintaining strong significance. *Business satisfaction* rises by ***.2386*** in OLS, with a slightly lower but still significant effect of ***.2007*** in IV at 10% level. However, for *profit reinvestment*, the OLS estimate of ***.1276*** loses significance in the IV model, with a reduced effect of ***.554***. These findings suggest that IAS participation has a robust, positive impact on most business outcomes, with IV estimation providing a more conservative validation of these effects, especially for outcomes like profit margin, customer growth, and revenue increase.

5.7 PSM Estimation

For further robustness check, the study uses Propensity Score Matching (PSM) with nearest-neighbor matching and a 0.1 caliper to match IAS participants with non-participants who have similar characteristics, minimizing selection bias. This robustness check ensures that observed differences in business outcomes, such as profit and customer growth, are due to IAS participation and not pre-existing differences, strengthening the study's findings.

Table 14: Comparative Test: OLS and PSM (ATT & ATET)

Business Outcomes	OLS Estimation	Instrumental Variable Estimation (IV)	Propensity Score Matching (PSM)	
			ATT	ATET
Business Profit Margin	0.2779*** (0.0581)	0.2414*** (0.0622)	0.2754*** (0.0547)	0.2677*** (0.0735)
Customer Growth	0.2868*** (0.0632)	0.2189*** (0.0669)	0.2314*** (0.0567)	0.2573*** (0.1399)
Revenue Increase	0.5374*** (0.1017)	0.5276*** (0.0110)	0.4920*** (0.0984)	0.4750*** (0.1013)
Business Satisfaction	0.2386 (0.0666)***	0.2007** (0.0689)	0.1635* (0.0979)	0.1489* (0.0820)
Profit Reinvestment	0.1276** (0.0563)	0.0554 (0.0585)	0.0737** (0.0491)	0.1976*** (0.0827)

Standard error in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The findings highlighted in *Table 14* provide a comparative analysis of the robustness of IAS participation effects across different estimation methods: OLS, IV, and PSM. This showed consistency in IAS's positive impact on various business outcomes, with slight variations in effect size across methods, which reflects the robustness of the results.

For *Business Profit Margin*, OLS estimates, on average, a significant increase of ***.2779***, holding other factors constant, while IV slightly reduces this to ***.2414,*** suggesting potential endogeneity in the OLS results. PSM methods, both **ATT** ***.2754*** and **ATET** ***.2677,*** align closely with the OLS findings, indicating that IAS participation robustly enhances profitability, likely due to years of practice, improving business skills, particularly negotiation skills imparted through mentorship and training. This consistency across methods underscores the credibility of IAS's influence on profitability.

Customer Growth shows similar robustness, with OLS indicating a ***.2868*** increase on average at a 1% significance level, while IV reduces this effect to ***.2189,*** again hinting at possible endogeneity. ATT estimates a slightly higher effect at ***.2314,*** while ATET is at ***.2538*** and was statistically significant at 1% level. The reduction in effect size with IV and ATT may reflect varying levels of customer base growth tied to regional market conditions or competitive environments.

Revenue Increase is where IAS's impact is most pronounced. The OLS estimated ***.5374*** on average at 1% significance level, with IV slightly lower at ***.5276***. PSM methods, though slightly lower, also indicate increases at **ATT** at ***.4920*** and **ATET** at ***.4750*** 1% significance level. These results suggest that IAS participants experience substantial revenue growth, likely due to increased customer bases and improved business skills to navigate an informal space.

Business Satisfaction shows positive effects in OLS ***.2386*** and IV ***.2007***, both significant. However, satisfaction decreases in PSM with **ATT** at **.1635** and further for **ATET** at ***.1489*** at a 10% significant level. This variation could imply that while IAS participation generally enhances satisfaction, external factors like market challenges and country specific economic situations causing limited growth opportunities could temper overall satisfaction levels for certain participants.

For *Profit Reinvestment*, OLS shows a ***.1276*** increase on average, significant at the 1% level, but IV reduces this to a non-significant ***.0554.*** PSM results, however, show a ***.0737*** effect in **ATT** significant at 5% and a notably higher ***.1976*** in **ATET** at a 1% significant level. This suggests that IAS's effect on reinvestment is more pronounced among highly committed participants, who likely view reinvestment as a pathway to sustaining and growing their businesses. The higher ATET in PSM could reflect a stronger reinvestment drive in those benefiting the most from IAS, further enhancing business resilience.

These findings reinforce the robustness of IAS's positive impact based on access to mentorship, training, and funding across multiple estimation methods, especially on profitability and revenue growth. These results align well with the findings from the literature, supporting the premise that the IAS multicomponent nature combining mentorship, training, and financial support drives substantial business advantages for its participants. The variation in effect sizes across methods indicates that participating in IAS is effective; factors such as participant commitment and market conditions may modulate the size of these outcomes.

6.0 DISCUSSION OF FINDINGS

a. Demographic And Socio-Economic Characteristics: *Respondents and Parental Background*

The average age for respondents is 37.31 years, with broad age distribution from 17 to 72 years. IAS participants are slightly older on average (38.18 years) compared to non-participants (36.53 years). This age difference could imply that older individuals are more likely to engage in the IAS, potentially driven by greater life experience or economic motives that align with seeking structured support for business growth, as noted in similar findings by Kabeer (2018) on age-related economic pursuits. The sample also reflects a significant gender imbalance, with 72% male respondents. This discrepancy is especially prominent within the IAS group, where 90% of participants are male, compared to 55% among non-participants. This trend could be attributed to cultural or structural barriers that make IAS more accessible or appealing to men. Literature, such as studies by Al-Dajani and Marlow (2013), supports that men often dominate entrepreneurial spaces in regions where traditional gender roles are more prevalent, suggesting that socio-cultural dynamics may influence access to or interest in programs like IAS. Marital status shows relative consistency across groups, with around 40% of respondents married. Specifically, 41% of IAS participants and 39% of non-participants are married, indicating balanced representation in marital status. Studies by Grantham et al. (2021) highlight that marital status can impact an individual's entrepreneurial engagement, though it appears uniformly across IAS and non-IAS groups here.

In terms of educational attainment, findings suggest that most respondents have completed at least primary or secondary education. However, IAS participants tend to have a lower educational level than non-participants, with 83% of IAS participants holding only primary or secondary education, compared to 57% of non-participants. This trend implies that individuals with less formal education may see IAS as a valuable alternative for economic empowerment. Research by Deissinger (2015) supports the notion that less formally educated individuals gravitate towards apprenticeship models to gain practical skills that enhance economic mobility.

The trend of lower education extends to the respondents' parents, with approximately 82% of parents across the sample having only primary or secondary education, but a closer look reveals

that IAS participants are more likely to have parents with primary education. This suggests a generational trend where individuals from less-educated backgrounds see IAS as a pathway to upward mobility, aligning with findings by Iwara et al. (2019), which emphasize the appeal of apprenticeship models in socio-economically disadvantaged communities. Parental employment shows a high prevalence of self-employment among both IAS and non-IAS groups, with 76% of fathers and 75% of mothers among IAS participants self-employed, slightly lower than the 79% for fathers and 80% for mothers in the non-participant group. These patterns suggest that many respondents come from entrepreneurial or self-employed family backgrounds, supporting the findings by Ikelegbe (2020) on the influence of family business models in encouraging entrepreneurship in offspring.

Findings for the primary income source of parents reveal that 76% of respondents have parents involved in SMEs or farming. Among IAS participants, this rises to 83%, compared to 69% for non-participants. This over-representation of SME backgrounds among IAS participants suggests that individuals from modest economic backgrounds, often in small-scale trade or farming, may seek IAS as a means to grow beyond these economic constraints, aligning with evidence from Adesoji (2021) on the role of apprenticeships in lifting economically marginalized groups.

Location of parents' housing shows that 38% of respondents have families based in rural areas, with a higher rural representation among IAS participants (52%) than among non-participants (26%). This finding may indicate that IAS appeals more strongly to those from rural areas, where formal employment opportunities are scarcer, reinforcing research by Nwaka (2015) on the rural orientation of apprenticeship programs in Nigeria. Parental Homeownership is more common among IAS participants, with 52.5% owning their homes compared to 42.7% of non-participants. This could reflect a rural tendency towards homeownership, as rural residents are generally more likely to own homes than urban residents, supporting arguments by King (1996) on rural ownership patterns.

Family welfare assistance shows that 39.2% of the sample receive welfare support. IAS participants report a higher rate of family support, 47.1%, compared to non-participants, 32.8%. This suggests that IAS participants may come from backgrounds with fewer support networks, making apprenticeships an attractive option for economic advancement. Research by Adi (2012) reinforces the notion that apprenticeship systems like IAS can offer a viable alternative for people from disadvantaged backgrounds. The findings show a large dominance of low-income earners, with the average estimated income for the sample being ₦163,626, with IAS participants slightly higher at ₦169,366.8 compared to ₦158,391.6 for non-participants. This aligns with the World Bank's (2021) findings that informal sectors in low and middle-income countries absorb a substantial portion of the workforce, particularly among individuals who lack access to financial resources or higher education. Gbandi & Amissah (2014) support this observation by highlighting that informal sectors provide accessible opportunities for low-income earners to sustain livelihoods, especially in developing economies where formal job opportunities are scarce.

b. Multi-component Rating by IAS Participants

In section 5.2, the study explored how IAS participants perceive the impact of the various components of the Igbo Apprenticeship System (IAS) on their business success, as summarized in Table 7. These ratings reveal that mentorship, knowledge and training, cash/goods settlement, market orientation, and ease of customer acquisition are key elements contributing to their entrepreneurial journey.

Mentorship is highlighted as the most critical component, with 44.33% of participants selecting it as their first choice. This strong preference suggests that mentorship plays a foundational role in guiding and supporting participants as they navigate the complexities of running a business. Mentorship's top ranking aligns with findings from studies by Ikelegbe (2020) and Al-Dajani and Marlow (2013), which emphasize the transformative effect of mentorship in entrepreneurship, especially in informal economic settings where access to structured business knowledge is limited.

Training was rated as the highest third-choice component (36.17%), suggesting that while participants find it essential, it is perceived as secondary to mentorship and financial support. The value placed on training aligns with research by Nwaka (2015), who underscores the importance of skill acquisition in enhancing business resilience and adaptability, especially among entrepreneurs with limited formal education. Training contributes to a sustained growth trajectory, providing participants with the necessary skills to operate and expand their businesses over time.

Cash/goods settlement, primarily selected as the second choice (35.46%), underscores the significance of initial financial support. This finding suggests that funding, whether through cash or goods, is crucial for helping participants establish a stable footing in the early stages of business. Studies by Kabeer (2018) and Adesoji (2021) corroborate this, showing that financial support can be a powerful enabler in entrepreneurship, particularly for individuals from disadvantaged backgrounds who lack alternative funding sources.

Market orientation and *ease of customer acquisition* were rated lower than the other components. Market orientation had its highest rating as a fifth choice (35.82%), indicating it is beneficial but not as immediately impactful as mentorship, training, and financial support. This may suggest that participants prioritize foundational support over market strategies, likely due to the immediate demands of business stability in a competitive environment. However, understanding the market remains beneficial for long-term growth, as highlighted by Nnonyelu (2020), who emphasizes market insight as a strategic asset in competitive settings.

Ease of customer acquisition, selected as a fourth choice by 57.09% of participants, indicates that building a customer base is essential but becomes a priority only after the foundational elements of mentorship and financial support are secured. This preference reflects the importance of developing customer relationships and networks, an aspect supported by research on the Igbo Apprenticeship System's networking benefits (Agozino & Anyanike, 2007).

These ratings show that IAS participants value mentorship, training, and financial support as the primary drivers of their business success, with mentorship perceived as the most valuable component.

c. IAS: Nature, Motivation, limitations and Perceived impact

The study highlights that most IAS participants (59.9%) join out of necessity, driven by financial instability or limited job opportunities. This aligns with research by Amine and Staub (2009), which suggests that economic hardship is a key motivator for informal entrepreneurship in sub-Saharan Africa, where survival often depends on informal systems. In this context, IAS offers both financial stability and a chance to acquire business skills, serving as an alternative to scarce formal employment. Thus, IAS can be viewed as a dual-purpose mechanism: it not only provides economic relief but also builds entrepreneurial competencies among those with limited options.

Family background also plays a critical role. With 80.4% of participants coming from families who identified as "poor" at the time of joining, IAS appears to be particularly relevant for economically disadvantaged families. The average 6.26-year duration in the program reflects the time needed for hands-on skill acquisition, resonating with Igwe et al. (2018), who underscore that prolonged mentorship and practical training are crucial in informal business settings.

Social networks within IAS further illustrate its communal aspect. A substantial 67% of participants had relatives or friends in IAS before joining, and 79% reported additional family members joining after them. This cyclical engagement suggests that IAS functions not only as a skills acquisition system but also as a culturally embedded support network. This pattern aligns with Olulu and Udeora (2018), who observed the significance of familial bonds in Nigerian business culture, where economic success often encourages wider family involvement.

The system's effectiveness is evident in participants' perception of business success, with 61% attributing significant achievements to their IAS experience. This finding parallels Kabeer's (2018) argument that skill-based programs can greatly enhance economic capabilities. Moreover, 76.5% of participants now sponsor a sibling or relative's education, showing that IAS's benefits extend beyond the individual, positively impacting family welfare and educational opportunities for future generations. This wider social impact highlights IAS's potential role in reducing poverty and promoting intergenerational support.

A majority (79.7%) of IAS participants reported having an established customer base upon completing their apprenticeship, underscoring the system's role in network-building. Despite these achievements, some participants hesitate to recommend IAS due to negative experiences such as exploitation by "bad bosses," unfulfilled settlement promises, and prolonged training. This reflects Nkamnebe and Idemobi's (2011) caution about the potential for exploitation in informal systems, emphasizing the need for regulatory oversight.

To address these challenges, participants suggest formalizing settlement agreements with legal protections, reducing training length, and increasing settlement amounts. Although 70.6% would still recommend IAS to family members, many acknowledge that structural reforms are needed to make the system more accessible and equitable, underscoring the need for evolving the IAS to meet modern standards of fairness and inclusivity.

Furthermore, there is a call for a female adaptation of IAS, with 57.09% of participants supporting the inclusion of women. This aligns with research by Eze (2018), which advocates for gender-inclusive adaptations in entrepreneurial systems to empower women economically. However, participants also expressed concerns about potential risks, such as harassment in close mentor-apprentice arrangements, suggesting that a separate, gender-sensitive program could better accommodate women's needs while ensuring safety and equality.

Lastly, 74.2% of respondents believe that female economic empowerment through IAS could benefit households, as women often reinvest in family welfare, especially in children's education. This finding supports Kabeer's (1999) view on the ripple effects of women's economic empowerment on household welfare, which can promote broader social and economic improvements across generations.

These findings suggest that while IAS provides a significant economic pathway for low-income individuals motivated by necessity, it also faces challenges that call for reform.

d. IAS Impact on Business Outcomes: Multi-componentality

The findings reflect the multi-component impact of the Igbo Apprenticeship System (IAS) on business outcomes, specifically through its combination of mentorship, skill transfer, and capital support. These components are widely recognized in the literature as key drivers of entrepreneurial success, particularly in informal economies (Al-Dajani and Marlow 2013). The IAS's structure, which integrates these elements, has likely contributed to the significant positive effects observed across profitability, customer growth, revenue increase, and satisfaction. These results align with Familoni (2024), who highlighted the system's critical role in entrepreneurship development in Nigeria, noting that 98% of respondents have participated in the system, and over 60% have sustained their businesses for more than ten years. The study's findings are also consistent with the results of Ekesiobi and Dimnwobi (2021), who found out that entrepreneurs who participated in the IAS tend to have higher business survival rates, business growth rates, and access to trade and informal credit, while non-IAS entrepreneurs have better access to formal credit source than the IAS graduates.

Research shows that **mentorship** provides structured guidance, allowing experienced business owners to share essential knowledge; as Adeola (2020) emphasizes, not just access to mentorship, the quality and frequency matter. It is crucial in transferring not only technical skills but also tacit knowledge, such as negotiation techniques, customer handling, and strategic thinking. Al-Dajani and Marlow (2013) emphasize that mentorship within entrepreneurial programs enhances business performance by fostering confidence and market insight, both of which are critical in informal sectors. The mentorship component in IAS appears to be aligned with these findings, as demonstrated by the significant increase in customer growth (OLS estimate: 0.2868, ATT: 0.2314, ATET: 0.2573), suggesting that IAS participants are able to leverage customer acquisition skills imparted through mentorship.

The **training** aspect of IAS, focused on hands-on business skills, aligns with findings from Ekekwe (2022), who highlights that practical skill acquisition in real business environments directly translates to improved business outcomes. This multi-component effect of mentorship and training likely underpins the strong impacts on revenue increase (OLS estimate: 0.5374, IV estimate: 0.5276), as the combination of skill acquisition and real-time application enables IAS participants to navigate market complexities and build sustainable customer bases. Neuwirth (2018) describes similar outcomes in apprenticeship systems, where skill transfer boosts revenue generation through improved operational efficiency and customer satisfaction. Skill training equips participants with essential business management skills, which Iwara et al. (2019) found to be crucial in the Igba-Boi apprenticeship for driving entrepreneurial growth especially noting the length of training.

Capital support is another critical component that contributes to the observed outcomes. Access to startup capital, whether in the form of cash or goods, allows entrepreneurs to overcome initial barriers to business establishment and growth, particularly where formal funding is scarce (Adesoji 2021, Olulu and Udeora 2018). Similarly, Grantham, Dowie, and de Haan (2021) argue that targeted financial programs can strengthen economic resilience among marginalized communities. The IAS's provision of resources appears to drive notable profit reinvestment among participants, as reflected in the higher ATET (0.1976) in PSM for profit reinvestment. This aligns with Kabeer (1999), who argues that capital support within mentorship programs encourages sustained growth and fosters a cycle of reinvestment.

The **synergistic effect** of combining mentorship, training, and capital support is evidenced in the robust positive impacts of IAS across multiple business metrics. Bhavani and Tendulkar (2001) argue that empowerment programs incorporating multi-component frameworks see compounded effects that individual interventions cannot achieve alone. This interconnectedness of mentorship, training, and capital, the '**multi-componentality,**' amplifies each component's effects, leading to a higher likelihood of sustainable success. Echoing Nwaka (2015) and Adeola (2020), the study affirms that IAS's integrated approach significantly enhances business metrics. Theoretically, this study reinforces the importance of multi-component support systems in informal economies, demonstrating how mentorship, practical training, and capital investment synergize to drive sustainable growth.

This multi-component framework has implications for designing entrepreneurship programs, particularly in informal economies. The IAS model, by enhancing business outcomes through a culturally rooted, integrated approach, provides a valuable blueprint for sustainable economic empowerment. It reinforces the importance of addressing multiple facets of entrepreneurial needs, supporting the literature that advocates for comprehensive frameworks in empowerment programs (Deissinger, 2015; Grantham et al., 2021). These results affirm that combining mentorship, training, and capital in one cohesive program can lead to substantial and sustainable business growth, especially in contexts where entrepreneurs face significant socio-economic challenges.

6.1 Policy Implications Recommendations

As the global community seeks inclusive development strategies that address gender imbalances and leverage culturally grounded systems, this study's insights present an opportune foundation for policy innovation. Integrating the multi-component and cyclically structured IAS model into broader economic frameworks could offer a powerful blueprint for entrepreneurship initiatives in regions with similar socio-economic conditions. Given the proven impact of multi-componentality from the Igbo Apprenticeship System (IAS) in building economic resilience, a gender-responsive adaptation is essential to support and empower women entrepreneurs. A redesigned, women-focused IAS model would not only foster entrepreneurship but also contribute to poverty alleviation and sustainable socio-economic growth.

Why women? The motivation stems from research emphasizing that economically empowering women has significant multiplier effects, as women are more inclined to reinvest in their families' health, education, and overall well-being (Kabeer, 1999). Hence, for long-term, intergenerational impact, Women's Economic Empowerment (WEE) serves as a critical component for lasting poverty reduction and community development.

7.0 CONCLUSION

This study conducted an impact evaluation of the Igbo Apprenticeship System (IAS) to assess its influence on essential business outcomes, using Propensity Score Matching (PSM) and Instrumental Variable (IV) estimation to mitigate selection bias and endogeneity. The findings confirm a substantial positive effect of IAS participation, showing significant increases in profit margins, revenue growth, and customer expansion. Notably, the IV estimations indicate that IAS participants experience an average profit margin increase to boost revenue growth and a higher rate of business expansion compared to non-participants holding other factors constant, giving insights into the effectiveness of the Igbo Apprenticeship System (IAS) whose key operating principles are integrating mentorship, training, and capital support in fostering entrepreneurial success. The findings of this study highlight the potential of locally developed systems, such as the IAS, to provide valuable insights into sustainable development strategies. The IAS features a multi-faceted structure that integrates mentorship, training, and financial support alongside a cyclical framework. This combination creates a powerful blueprint that connects community-based practices with broader economic empowerment objectives in line with the Sustainable Development Goals. However, the IAS framework reveals a gap in gender inclusivity, particularly for women who face unique barriers to accessing mentorship, training, and capital. To address this, the study proposes future research that could examine how the principles of multi-componentality and cyclicality could be adapted in similar contexts. Policymakers and development practitioners can explore its potential within women's economic empowerment programs as the world fights for a more inclusive and resilient economy that contributes to sustainable development and, ultimately, long-term poverty alleviation.

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APPENDICES

APPENDIX A:

Map of Nigeria showing the poverty rate in different states

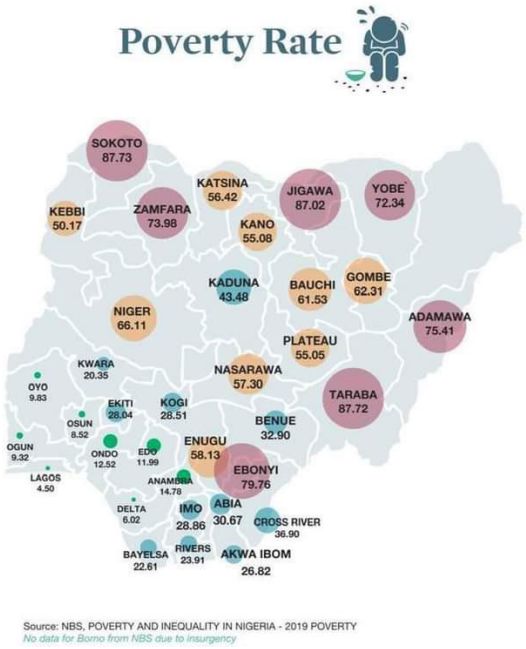


Table 1: **Variables measurement Section A**

Variable Name	Value Labels/Description	Type
Age_Respondent	Continuous	Continuous
Gender_Respondent	1 = Male, 2 = Female, 3 = Prefer not to say	Nominal
Marital_Status_Respondent	1 = Single, 2 = Married, 3 = Divorced, 4 = Widowed	Nominal
Edu_level_Respondent	1 = No formal education, 2 = Primary school, 3 = Secondary school, 4 = Tertiary education	Ordinal
Edu_level_Parents	1 = No formal education, 2 = Primary school, 3 = Secondary school, 4 = Tertiary education	Ordinal
Emp_Father	1 = Farming, 2 = Small business, 3 = Big business, 4 = Formal employment, 5 = Casual labor	Ordinal
Family_primary_source_income	1 = Farming, 2 = Small business, 3 = Big business, 4 = Formal employment, 5 = Casual labor	Nominal
Location_family_housing	1 = Rural, 2 = Suburban, 3 = Urban, 4 = Informal settlement, 5 = Temporary shelter	Nominal
ownership_family_housing	1 = Owned home, 2 = Rented home, 3 = Lived with relatives, 4 = Temporary shelter, 5 = Other	Nominal
family_social_assistance	Yes/No	Binary (Nominal)
Informal_educ_for_children	1 = Vocational training, 2 = Entrepreneurship, 3 = Agricultural skills, 4 = Sports training, 5 = Music/Arts	Nominal
Estim_Household_Income	Continuous	Continuous

Table 2: **Variables measurement Section B**

Variable Name	Value Labels/Description	Type
Respondent_Group	1 = Treatment (IAS Participants), 0 = Control	Nominal (Categorical)
length_years_ias	Continuous	Continuous
family_financial_condition	1 = Very Poor, 2 = Poor, 3 = Average, 4 = Good, 5 = Very Good	Ordinal
pri_motivation_for_joining_IAS	1 = Necessity, 2 = Opportunity, 3 = Passion/Interest, 4 = Family Tradition, 5 = Recommendation	Nominal
Num_Co_apprentices	Continuous	Continuous
employed_current_apprentices	Yes/No	Binary (Nominal)
num_of_current_employed_apprentices	Continuous	Continuous
impact_rate_IAS	1 = No Impact, 2 = Slight Impact, 3 = Moderate Impact, 4 = High Impact, 5 = Major Impact	Ordinal
Living_Conditions_IAS	1 = Very Poor, 2 = Poor, 3 = Average, 4 = Good, 5 = Excellent	Ordinal
recommend_IAS_to_family	Yes/No	Binary (Nominal)
recommendation_strength	1 = Not Strong, 2 = Slightly Strong, 3 = Moderately Strong, 4 = Very Strong, 5 = Extremely Strong	Ordinal
family_participation_before	Yes/No	Binary (Nominal)
family_participation_after	Yes/No	Binary (Nominal)
success_stories_IAS	Yes/No	Binary (Nominal)

Table 3: **Variables measurement Section C**

Variable Name	Value Labels/Description	Type
Business_monthly_Income	Continuous	Continuous
Business_Size	Continuous (number of employees)	Continuous
years_in_operation	Continuous	Continuous
business_expansion	Yes/No	Binary (Nominal)
business_establishment	1 = Family-Transferred, 2 = Self-Started, 3 = Co-Owned, 4 = Acquired	Nominal
business_profit_margin	1 = Less than 10%, 2 = 10%-20%, 3 = 20%-30%, 4 = 30%-40%, 5 = More than 40%	Ordinal
business_revenue_increase	1 = No Increase, 2 = Less than 10%, 3 = 10%-20%, 4 = 20%-50%, 5 = More than 50%	Ordinal
business_size_growth	1 = No growth, 2 = Slow growth, 3 = Moderate growth, 4 = Fast growth, 5 = Very fast growth	Ordinal
reinvest_profits	1 = Never, 2 = Occasionally, 3 = Regularly, 4 = Frequently, 5 = Always	Ordinal

customer_base_growth	1 = No growth, 2 = Slow growth, 3 = Moderate growth, 4 = Fast growth, 5 = Very fast growth	Ordinal
financing_living_expenses	1 = Family support, 2 = Stipend from mentor, 3 = Personal savings, 4 = Other	Nominal
access_to_credit	Yes/No	Binary (Nominal)
used_business_loans	Yes/No	Binary (Nominal)
source_of_loan	1 = Commercial Bank, 2 = Microfinance, 3 = Family/Friends, 4 = Cooperative, 5 = Investor, etc.	Nominal
registered_business_with_CAC	Yes/No	Binary (Nominal)
member_trade_union	Yes/No	Binary (Nominal)
business_performance	1 = Very Dissatisfied, 2 = Dissatisfied, 3 = Neutral, 4 = Satisfied, 5 = Very Satisfied	Ordinal

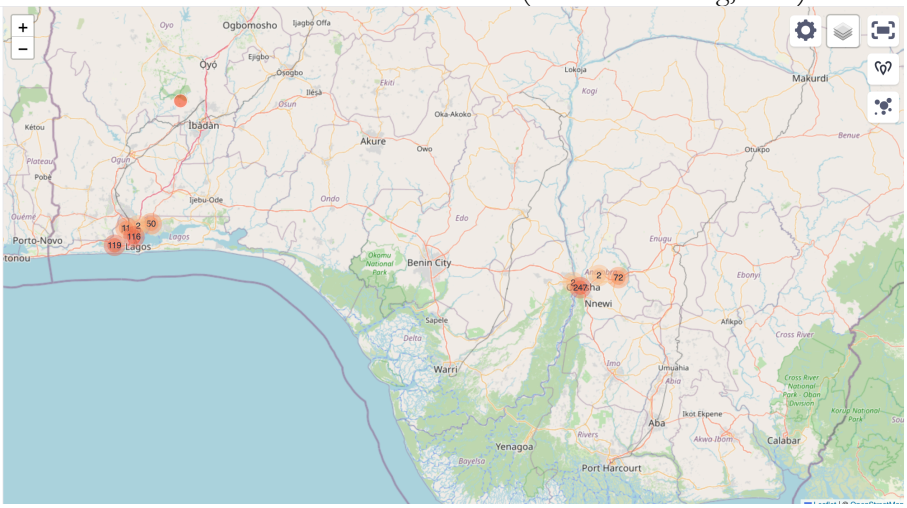
Table 4: **Variables measurement Section D**

Variable Name	Value Labels/Description	Type
business_mentor	Yes/No	Binary (Nominal)
mentorship_structure	1 = Formal, 2 = Semi-formal, 3 = Informal	Nominal
mentor_personalized_advice	Yes/No	Binary (Nominal)
mentor_communication_skills	1 = Poor, 2 = Fair, 3 = Average, 4 = Good, 5 = Excellent	Ordinal
mentor_availability	1 = Always, 2 = Often, 3 = Sometimes, 4 = Rarely, 5 = Never	Ordinal
mentor_hands_on_training	Yes/No	Binary (Nominal)
mentor_feedback	Yes/No	Binary (Nominal)
mentor_support_challenges	1 = Not Supportive, 2 = Slightly Supportive, 3 = Moderately Supportive, 4 = Very Supportive, 5 = Extremely Supportive	Ordinal
mentor_accessibility	Yes/No	Binary (Nominal)
mentor_networking_opportunities	Yes/No	Binary (Nominal)
mentor_honest_feedback	Yes/No	Binary (Nominal)
impact_mentorship_growth	1 = No Impact, 2 = Slight Impact, 3 = Moderate Impact, 4 = Significant Impact, 5 = Transformative Impact	Ordinal
recommend_mentor	Yes/No	Binary (Nominal)
training_before_business	Yes/No	Binary (Nominal)
training_type	1 = Vocational, 2 = Apprenticeship, 3 = University, 4 = Other	Nominal
training_preparation_for_business	1 = Poorly Prepared, 2 = Somewhat Prepared, 3 = Adequately Prepared, 4 = Well Prepared, 5 = Very Well Prepared	Ordinal

training_financial_management_skills	1 = Not at all, 2 = Slightly, 3 = Moderately, 4 = Very, 5 = Extremely	Ordinal
training_marketing_skills	1 = Not at all, 2 = Slightly, 3 = Moderately, 4 = Very, 5 = Extremely	Ordinal
training_customer_acquisition_skills	1 = Not at all, 2 = Slightly, 3 = Moderately, 4 = Very, 5 = Extremely	Ordinal
frequency_knowledge_assessment	1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Always	Ordinal
practical_tasks	Yes/No	Binary (Nominal)
frequency_hands_on_activities	1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Always	Ordinal
knowledge_relevance	1 = Not Relevant, 2 = Slightly Relevant, 3 = Moderately Relevant, 4 = Very Relevant, 5 = Extremely Relevant	Ordinal
impact_knowledge_on_business	1 = No Impact, 2 = Slight Impact, 3 = Moderate Impact, 4 = Significant Impact, 5 = Transformative Impact	Ordinal
training_recommendation	Yes/No	Binary (Nominal)
ability_to_manage_business_after_training	1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, 5 = Excellent	Ordinal
skills_applicability	1 = Not Applicable, 2 = Slightly Applicable, 3 = Moderately Applicable, 4 = Very Applicable, 5 = Fully Applicable	Ordinal
competence_in_business_operations	1 = Not Competent, 2 = Slightly Competent, 3 = Moderately Competent, 4 = Very Competent, 5 = Fully Competent	Ordinal
primary_source_of_capital	1 = Family, 2 = Friends, 3 = Personal Savings, 4 = Loans, 5 = Other	Nominal
alternative_means_of_capital	1 = Microfinance, 2 = Angel Investor, 3 = Bank Loan, 4 = Supplier Credit, 5 = Customer Advance	Nominal
total_amount_of_startup_capital	Continuous	Continuous
difficulty_in_securing_capital	1 = Not at all difficult, 2 = Slightly difficult, 3 = Moderately difficult, 4 = Very difficult, 5 = Extremely difficult	Ordinal
source_of_additional_funding	1 = Microfinance, 2 = Commercial Bank, 3 =	Nominal

	Family/Friends, 4 = Cooperative, 5 = Investor	
ability_to_maintain_customers	1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, 5 = Excellent	Ordinal
strategies_to_retain_customers	Yes/No	Binary (Nominal)
understanding_exploit_market_opportunities	1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, 5 = Excellent	Ordinal

Map Showing the two target locations: Lagos State (west) and Anambra State Onitsha (east)
Source: GPS tracker on KoboCollect Software (Kobotoolbox.org, 2024).



Showing the Eastern Anambra State 7 market clusters (Onitsha main market, Textile market, Ochanja, Building Material, Relief Market, Ogbogonogo and Eke awka)
Source: GPS tracker on KoboCollect Software (Kobotoolbox.org, 2024).

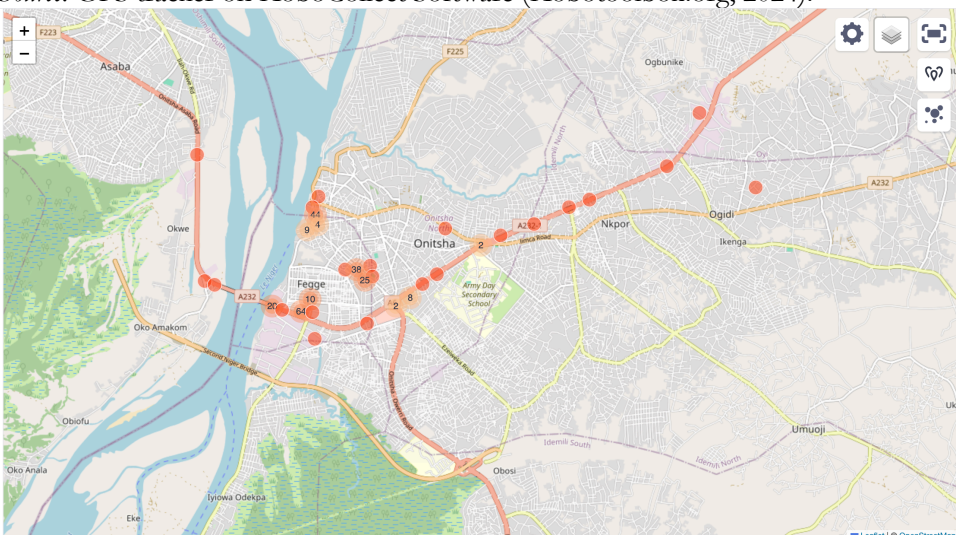
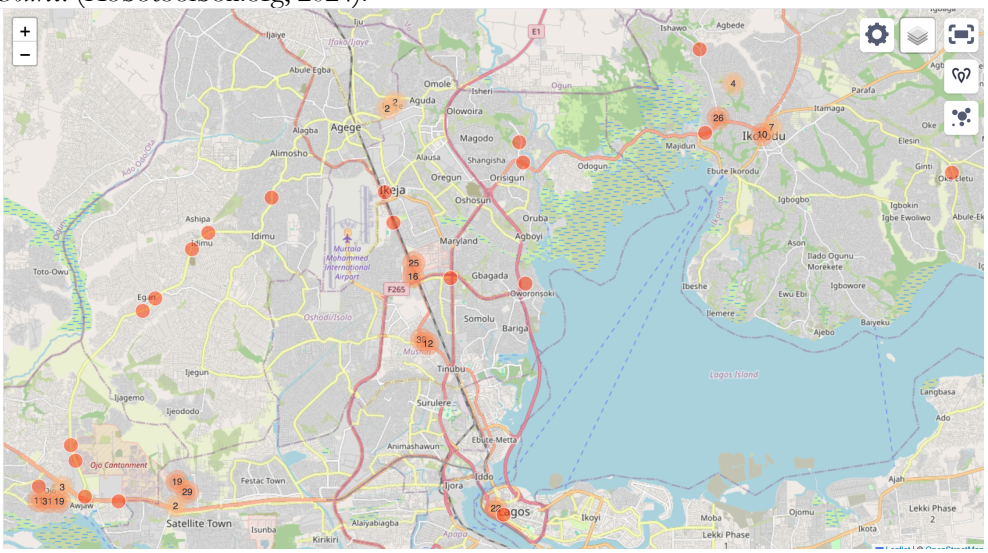
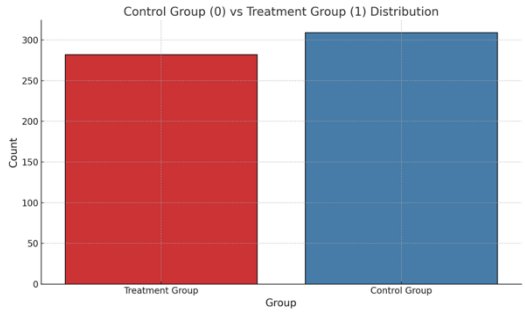


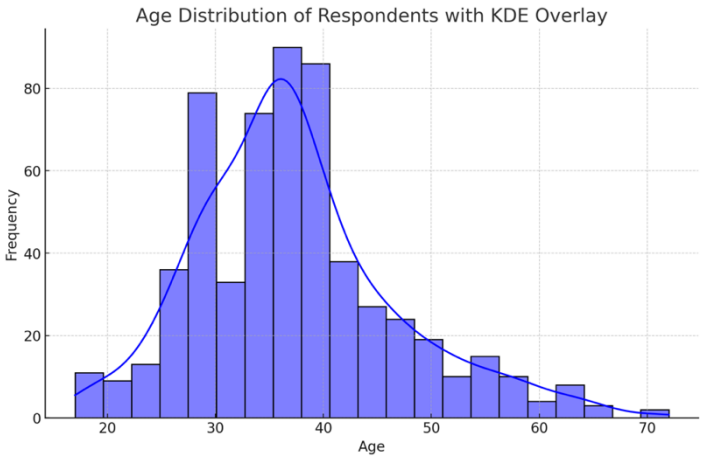
Figure 8 : Figure: Showing the Western Lagos 8 market clusters (Alaba, Mushin, Oshodi, Trade Fair, Lagos island, Ikorodu, Balogun
Source: (Kobotoolbox.org, 2024).



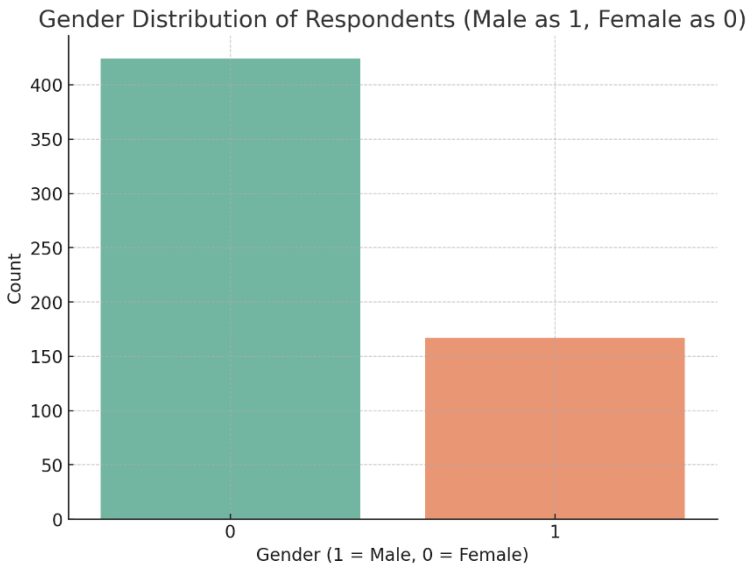
APPENDIX B: Demographic and socio-economic charts



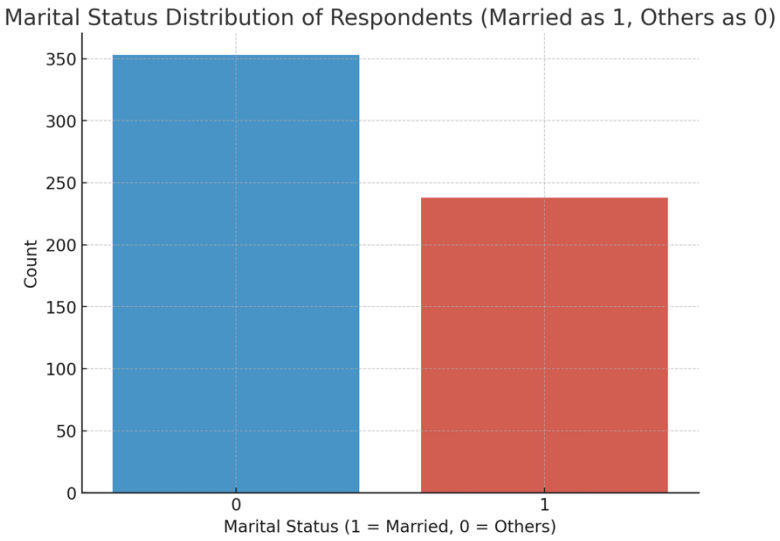
Respondent group: Treatment and Control group



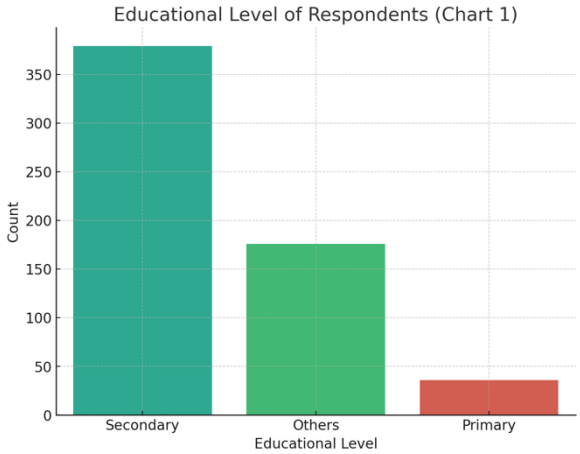
Age distribution of Respondents using the Kernel frequency distribution



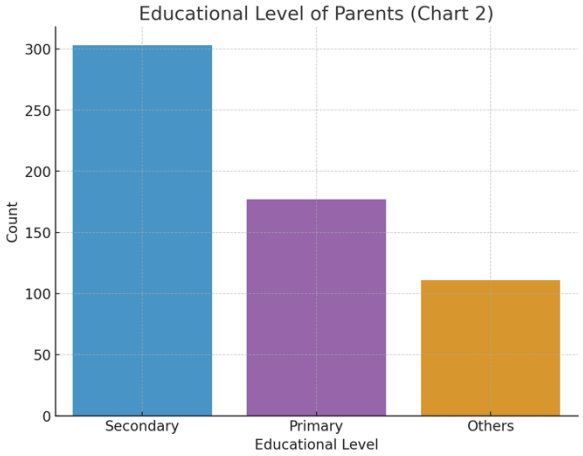
Gender of Respondents



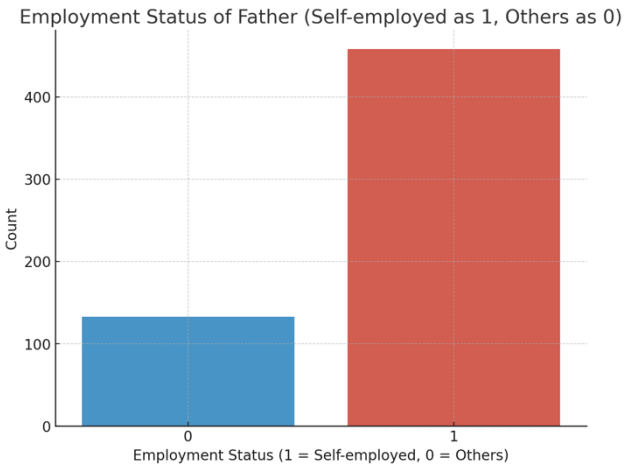
Marital status of Respondents



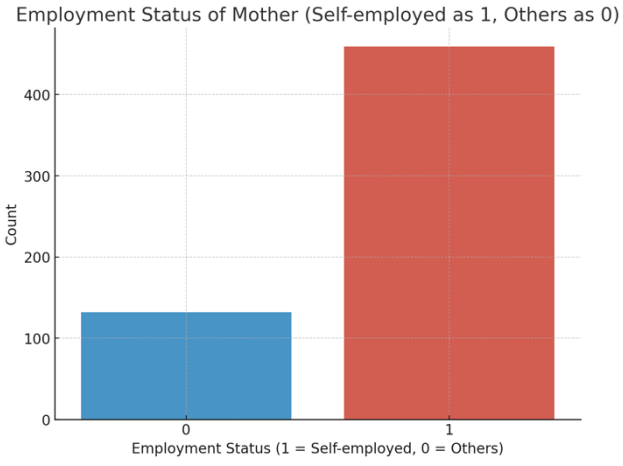
Educational of Respondents



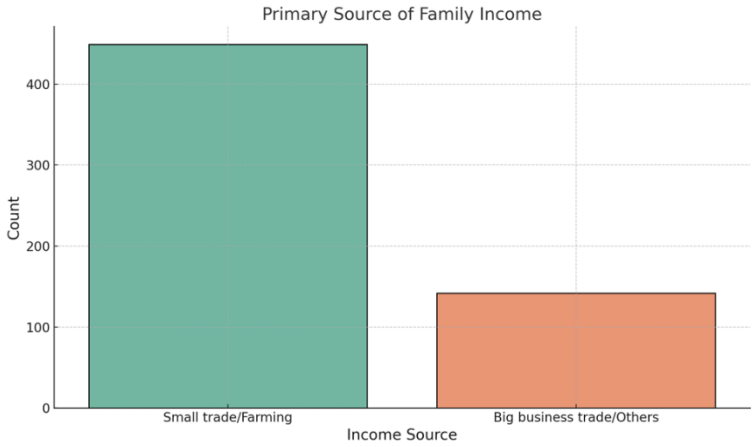
Educational level of Parents



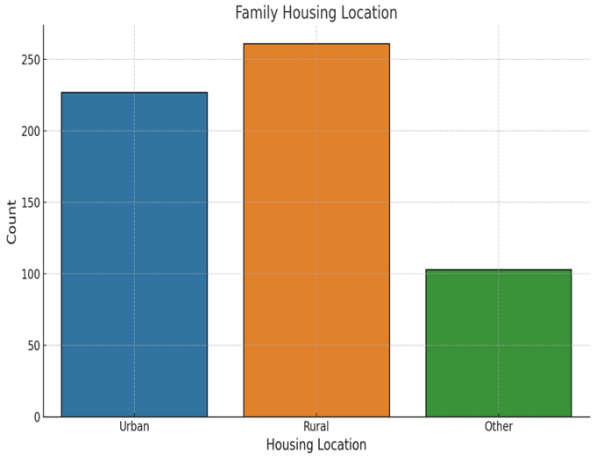
Employment status of Father



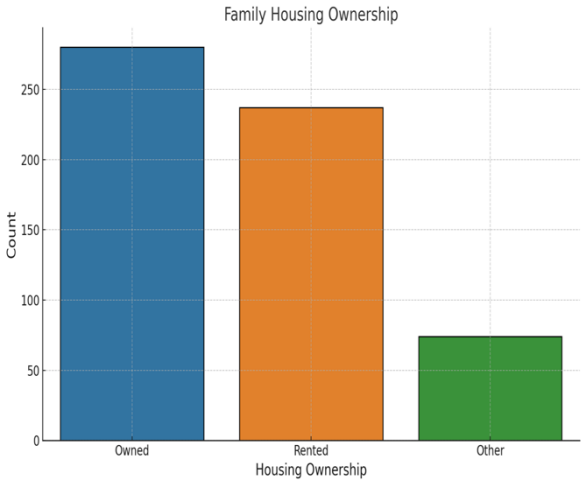
Employment status of Mother



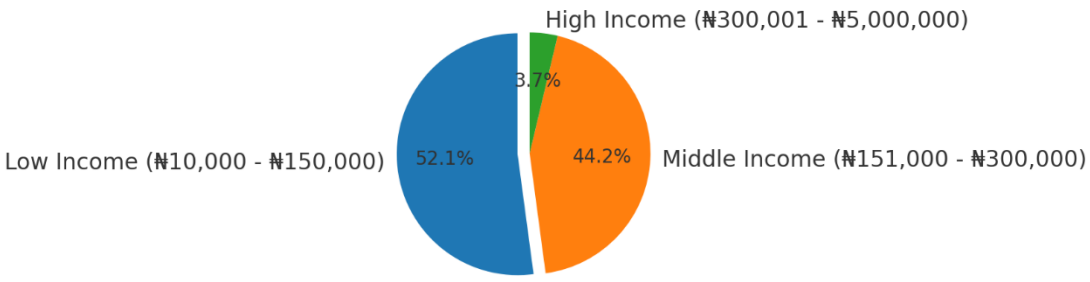
Family's Primary Source of Income



Location of Family Housing



Family Housing ownership



Estimated Household Income of Respondents