# Beyond formal education: Exploring informal apprenticeship as a pathway to entrepreneurial success from a Ghanaian perspective

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**Abstract:** This study investigates how informal apprenticeships serve as a pathway to entrepreneurship in Ghana, focusing on the factors influencing the decision to enter apprenticeships, trade selection, and entrepreneurial ambitions. Utilizing a multinomial logit model, the research examines data from 1,600 apprentices to identify the interplay between individual characteristics, financial limitations, and trade preferences. The analysis reveals that financial constraints significantly impact the decision to pursue an apprenticeship, while trade selection is largely influenced by perceived entrepreneurial prospects. Interestingly, individuals with higher educational qualifications tend to enter skilled trades, implying that formal education enhances their recognition of business potential in these fields. Contrary to expectations, guidance from parents and teachers appears to discourage apprenticeship participation. Additionally, catering and carpentry emerge as trades with strong entrepreneurial potential, though the limited range of available apprenticeship options presents a challenge. These insights question the notion that informal apprenticeships are primarily for academically weak students, highlighting the importance of strategic interventions to strengthen their role in fostering entrepreneurship. To enhance the effectiveness of informal apprenticeships, policies should focus on broadening trade options, incorporating entrepreneurship education, and strengthening the link between formal and informal learning systems. Further research could explore comparative studies of apprenticeship models across different contexts.

**Keywords:** Entrepreneurial potential, Informal apprenticeships, Multinomial logit model, Policy changes.

## 1. Introduction

Formal education often gets prioritized as the primary pathway to career success. For example, in Ghana, the implementation of the Free Compulsory Universal Basic Education (FCUBE) in October 1996 (a constitutional requirement) and the Free Senior High School in September 2017, are all geared towards promoting formal education in Ghana. However, a significant portion of the workforce acquires skills through informal apprenticeships leading to entrepreneurial success [1]. Notably in Ghana, informal apprenticeships contribute 80-90% of Ghana's skilled workforce (Ghana Statistical Service, 2017 - 2018). Yet, the sector lacks the recognition and support.

Now the Ghanaian government acknowledges the significance of informal apprenticeships and has implemented initiatives to bring more structure and regulation to the sector. One such effort is the enactment of the National Apprenticeship Policy (NAP) in 2020, to enhance the quality accessibility, and regulation of apprenticeship training for participants. However, successfully implementing and enforcing these policies remain a work in progress [2].

Prior research suggests various influences on career choices, including personal preferences, skills, financial gain, and family vocations [3-6]. Similarly Yeboah, et al. [7] have examined personal factors and other key success factors, such as personal branding, earlier startup intentions, and brand image formation, as precursors to entrepreneurial success. Some key factors identified include business ideas, customer satisfaction, team cohesion, business models and capital acquisitions, organizational abilities, human capital as well as innovativeness of new products [8-12]. According to ElMassah, et al. [13] the ability to secure financial resources, such as startup capital, and the ability to distinguish oneself from other entrepreneurs are credible antecedents to entrepreneurial success.

Generally, research examining the factors influencing career choice as a pathway to entrepreneurial success, consistently highlights the critical role of interpersonal relationships, but in different jurisdictions other than Ghana. In the Irish context, the Indecon International Research Economists [14, 15]. Identified family and peers as primary determinants of career decisions. These studies emphasize the importance of family and social capital in shaping career aspirations. While family and peers hold considerable influence, other factors also contribute to career decision-making. The Indecon International Research Economists Indecon International Research Economists [14] further identified work experience, career guidance teachers, class teachers, employer engagement, career assessment tools, and social media as relevant factors. Bright, et al. [16] corroborate the importance of family and teachers in the Australian context.

Besides, the role of teachers as career guide has also been highlighted as a complex one relative to the success of entrepreneurs [16]. This research is reflected in teachers' roles as trusted adults, particularly in relation to academic subject choices. However, Musset and Kurekova [17] caution that teacher advice, while well-intentioned, may be biased towards higher education pathways. This highlights the need for both specialized career guidance professionals and broader teacher involvement in career development and entrepreneurship.

Research also indicates disparities in career pathways based on gender and geographic location. Karmel and Roberts [18] and Karmel and Virk [19] found gender differences in occupational choices, with young men overrepresented in traditional trades and older men in transport roles. Geographic location also impacts apprenticeship completion rates, with rural areas showing higher completion rates compared to urban and remote areas [18, 20, 21]. Moreover, the level of qualification is a critical factor, with higher qualifications linked to increased completion rates [21, 22].

Considering the cases of Ireland, Scotland, and Australia, career choice is recognized as a multifaceted process influenced by a combination of personal, social, and contextual factors. These contexts emphasize the roles of family, schools, and peers as key influences. While these studies provide crucial insights into the factors affecting career success in these countries, the mechanisms by which these factors influence entrepreneurial success in Ghana remain unexplored. This highlights a notable gap in the existing literature regarding the key factors motivating young Ghanaians to choose informal apprenticeships as a pathway to entrepreneurial success. Additionally, there is a scarcity of studies examining the potential of these apprenticeships to equip individuals with the necessary skills and knowledge for entrepreneurial ventures in Ghana.

The distinctive nature of this study lies in its examination of the limited availability of career options within a community as a potential factor influencing youth career decisions. Interestingly, there is also a paucity of studies proposing actionable recommendations for stakeholders, including policymakers, educators, and industry leaders, to foster a more supportive environment for entrepreneurial endeavours within the informal apprenticeship system. This study aims to address these gaps by providing a comprehensive analysis of the factors influencing career choices and entrepreneurial success in the context of informal apprenticeships in Ghana. This study, therefore, focuses on the specific context of Ghana, where informal apprenticeships are often perceived as a last resort for underperforming students and the limited availability of career options within a community. This study, therefore, investigates the factors influencing young Ghanaians to choose informal apprenticeships over traditional educational routes [23].

Specifically, it identifies key factors motivating young Ghanaians to choose informal apprenticeships as a pathway to entrepreneurial success. It also examines the potential of these apprenticeships to equip individuals with the necessary skills and knowledge for entrepreneurial ventures. It further, proposes actionable recommendations for stakeholders, including policymakers, educators, and industry leaders, to foster a more supportive environment for entrepreneurial endeavours within the informal apprenticeship system

## 2. Methodology

This study utilizes a multinomial logit model to analyse data from one thousand, six-hundred apprentices across various regions in Ghana. By shedding light on the motivations and potential of informal apprenticeships, we hope to challenge the existing stigma and promote its role in cultivating a thriving entrepreneurial ecosystem in Ghana. It employs a survey design to investigate the factors influencing young Ghanaians' choice of informal apprenticeships as a path towards entrepreneurial ventures. Survey research has proved to be a very effective and common approach in addressing studies relating to behavioural research and by extension, it is effective in capturing decision variables [24]. As mentioned earlier, data collection involved administering structured questionnaires to a sample of 0ne thousand, six-hundred apprentices in Ghana. To ensure representativeness, a multistage sampling technique was implemented. Also, Alvi [25] described multistage sampling technique as very effective in enhancing the representativeness of a sample as the method acknowledges the heterogeneity within the informal apprenticeship population by initially dividing it into vocational groups (carpentry, mechanics, tailoring, hairdressing, catering, driving, masonry, and auto-electrical). Subsequently, a random sample of apprentices within each vocational group across four regions of Ghana was selected.

The questionnaires captured data on various factors potentially influencing the choice of informal apprenticeships for entrepreneurial purposes. These factors include financial constraints, parental and teacher influence, self-motivation, career limitations within a community, peers and educational background.

Data analysis involved a multi-step process. First, descriptive statistics were used to assess the vocational and educational backgrounds of the respondents, disaggregated by gender. This step helps identify potential gender disparities in apprenticeship choices. Second, a correlation matrix was employed to evaluate the relationships between the independent variables (factors influencing choice) to ensure suitability for multinomial logit (MNL) which uses maximum likelihood for estimation. Finally, MNL models were developed using Minitab statistical software (because it also uses maximum likelihood) to analyse the data and identify the most significant factors influencing the decision to pursue informal apprenticeships with an entrepreneurial focus.

### 2.1. Development of the Apprenticeship Logit Models

Multinomial logistic regression extends binary logistic regression to analyse situations with more than two categorical outcomes (choices). It compares the likelihood of choosing each option to a chosen reference category, instead of just one outcome versus its opposite [26]. Apprenticeships in this context represent the response variable $Y_j$, categorized into eight options, while ten explanatory variables $x_i$ were considered. The multinomial logit model is particularly well-suited for this scenario due to the characteristics of the data, such:

a. *Categorical and Unordered Choices:* There are eight distinct apprenticeship options, and the order of preference doesn't necessarily matter (e.g., auto-mechanical engineering is not inherently better than catering).

b. *Mutually Exclusive:* Individuals can only choose one apprenticeship option at a time [27-31].

The core principle behind the multinomial logit model lies in the concept of utility. It assumes that each apprentice associates a certain level of satisfaction (utility) with each apprenticeship option. The

model predicts that individuals will ultimately choose the option that offers them the highest utility. Mathematically, the random utility $U_{ij}$ for the $ith$ respondent is represented by Equation (1).

$$U_{ij} = X_i \beta_j + \varepsilon_{ij} \qquad (1)$$

Building on this principle, the Random Utility Maximization (RUM) framework aims to maximize the likelihood that the chosen option $j$ will be the one with the highest utility for the apprentice. This is expressed mathematically in Equation (2), [30].

$$P(Y_i = j) = P\left(U_{i,j} = \max_{k=1,\dots,J} U_{i,k}\right) \qquad (2)$$

*2.1.1. Model Identification and Coefficients*

For the model to be identifiable (meaning its parameters can be uniquely estimated), one category must be chosen as a reference point for comparison. In this study, "driving" is chosen as the reference category. The model then estimates a set of coefficients for each of the remaining seven apprenticeship categories, allowing us to understand how each independent variable (financial problems, educational level, parent influence, teacher influence, peer influence, academic performance, limited apprenticeship options, self-employment, self-motivation, and lucrativeness) influences the likelihood of choosing a specific option compared to driving. Equation (3) depicts the probability of an individual (apprentice) selecting a particular apprenticeship option [29, 30, 32-37].

$$P(Y = j/X_i) = \frac{e^{\beta_{ij} X_i}}{1 + \sum_{j=1}^{J} e^{\beta_{ij} X_i}} \qquad (3)$$

Where $P$ is the probability of selecting choice $j$ ($j = 1,2,\dots,8$), by an individual $X$ with characteristic $i = 1,2,\dots 10$, and $\beta_j$, a set of coefficients corresponding to each choice category [28, 30, 38].

*2.1.2 Transformation and Odds Ratio*

The apprenticeship multinomial logit models are further transformed into a series of binary logit models as in Equations 4, 5, 6, and 7).

$$P_j/P_J \ for \ j = 1,\dots,J-1 \qquad (4)$$

For example, if option 1(auto-mechanical) is selected, then,

$$\frac{P_1}{P_8} = e^{(\beta_{01} + X_1 \beta_{11} + X_2 \beta_{21} + \dots + X_{10} \beta_{101})} \qquad (5)$$

If option 2 (auto-electrical) is selected, then,

$$\frac{P_2}{P_8} = e^{(\beta_{02} + X_1 \beta_{12} + X_2 \beta_{22} + \dots + X_{10} \beta_{102})} \qquad (6)$$

$$\dots$$

And if option 7 (Hairdressing) is chosen, then,

$$\frac{P_7}{P_8} = e^{(\beta_{07} + X_1 \beta_{17} + X_2 \beta_{27} + \dots + X_{10} \beta_{107})} \qquad (7)$$

This allows us to estimate the coefficients for each independent variable within each category compared to the reference category (driving). A positive coefficient suggests that a unit increase in the corresponding variable makes it more likely for an individual to choose that specific option. Conversely, a negative coefficient indicates a lower likelihood of choosing that option. From Equation (4), the odds ratio is given by

$$P_j/P_J = e^{\sum_{i=1}^{10} \beta_{ij}} \qquad (8)$$

The odds ratio, defined by Equation (8), provides a more intuitive interpretation of the coefficients. It represents the relative odds of choosing a particular option compared to the reference category (driving). An odds ratio greater than 1 suggests a higher chance of choosing that option, while a value less than 1 indicates a lower chance. The next section delves into the interpretation of the estimated coefficients and odds ratios from the model. This will provide a clearer understanding of the specific factors that significantly influence individuals' choices when selecting an apprenticeship program [27, 28, 31, 39-42].

## 3. Results

*3.1. Gender Distribution and Educational Background*

**Table 1.**
Distribution of apprenticeship vocation by sex

| Apprenticeship | Male | | Female | |
|---|---|---|---|---|
| | Freq. | % | Freq. | % |
| Auto Mechanical | 242 | 23.84 | 8 | 1.37 |
| Auto Electrical/Electronics | 147 | 14.48 | 3 | 0.51 |
| Catering | 42 | 4.14 | 218 | 37.26 |
| Masonry | 170 | 16.75 | 0 | 0.00 |
| Carpentry | 148 | 14.58 | 2 | 0.34 |
| Sewing (Tailor/Seamstress) | 70 | 6.90 | 170 | 29.06 |
| Hairdressing | 2 | 0.20 | 178 | 30.43 |
| Driving (commercial) | 194 | 19.11 | 6 | 1.03 |
| Total | 1015 | 100.0 | 585 | 100.0 |

**Source:** Mwinkume, et al. [43]

Significant gender segregation in vocational training is highlighted in the Table 1, with one sex predominating in some sectors. Social standards, gender preconceptions, and perceived physical or skill needs are probably the main causes of this segregation.

In the Auto Mechanical profession, for example, men make up approximately 24% of all apprentices, while women make up only 1.37%. This indicates that the field is heavily dominated by men. This points to a significant gender bias in favour of men, which may be brought on by societal expectations or perceptions of physical demands. The prejudice that links technical job to men is also evident in Auto Electrical/Electronics, where men make up 14.48% of the workforce compared to just 0.51% for women.

This disparity may be influenced by similar factors as those in masonry. Sewing is predominantly female, with females constituting 29.06% of the total apprentices, compared to 6.90% for males. This aligns with traditional gender roles where tailoring and seamstress work are seen as female oriented. Hairdressing is overwhelmingly female, with females making up 30.43% of their total apprentices, while males are only 0.20%. This reflects societal norms associating hairdressing with women. Commercial driving is predominantly male, with males constituting 19.11% of their total apprentices, compared to 1.03% for females. This may be due to perceptions of driving as a male-dominated profession.

**Table 2.**
Distribution of educational level of apprentices by sex.

| Educational Level | Male | | Female | | Total | |
|---|---|---|---|---|---|---|
| | Freq. | % | Freq. | % | Freq. | % |
| Primary | 83 | 8.18(69.7) | 36 | 6.15(30.3) | 119 | 7.44 |
| JSS/JHS | 637 | 62.76(66.4) | 322 | 55.04(33.6) | 959 | 59.94 |
| SSS/SHS | 138 | 13.60(52.5) | 125 | 21.37(47.5) | 263 | 16.44 |
| Technical/Vocational | 64 | 6.31(48.1) | 69 | 11.79(51.9) | 133 | 8.31 |
| Tertiary | 21 | 2.07(84.0) | 4 | 0.68(16.0) | 25 | 1.56 |
| Non-Formal | 72 | 7.09(71.3) | 29 | 4.96(28.7) | 101 | 6.31 |
| Total | 1015 | 100.0 | 585 | 100.0 | 1600 | 100.0 |

**Source:** Mwinkume, et al. [43]

Table 2 presents the distribution of apprentices' educational levels based on gender. Most apprentices have completed Junior Secondary/High School (JSS/JHS), accounting for 59.94% of the total, with more males (62.76%) than females (55.04%). A smaller proportion attained Senior Secondary/High School (SSS/SHS) education (16.44%), with males slightly outnumbering females.

Primary education accounts for 7.44%, with a higher proportion of males (8.18%) compared to females (6.15%). Similarly, non-formal education represents 6.31% of apprentices, with males forming

the larger percentage (7.09%). Technical/Vocational education comprises 8.31%, with a near-equal gender distribution. Tertiary education is the least represented category (1.56%), with a significant gender gap, as males (2.07%) outnumber females (0.68%).

Overall, most apprentices (over 93%) had some formal education before entering the informal apprenticeship system, with male participants generally having higher educational attainment than their female counterparts.

### 3.2. Factors Influencing Apprenticeship Choice

**Table 3.**
Multiple contribution analysis of predictor variables.

| | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ | $X_7$ | $X_8$ | $X_9$ | $X_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| $X_1$ | 1.000 | | | | | | | | | |
| $X_2$ | 0.131 | 1.000 | | | | | | | | |
| $X_3$ | 0.055 | 0.177 | 1.000 | | | | | | | |
| $X_4$ | 0.009 | 0.023 | 0.179 | 1.000 | | | | | | |
| $X_5$ | -.028 | 0.042 | 0.115 | 0.291 | 1.000 | | | | | |
| $X_6$ | 0.059 | 0.059 | 0.034 | 0.161 | 0.301 | 1.000 | | | | |
| $X_7$ | -.009 | 0.019 | 0.054 | 0.222 | 0.215 | 0.305 | 1.000 | | | |
| $X_8$ | 0.020 | 0.017 | 0.005 | 0.026 | -.010 | 0.023 | 0.066 | 1.000 | | |
| $X_9$ | 0.017 | 0.021 | -.027 | 0.000 | 0.011 | 0.003 | -.020 | 0.304 | 1.000 | |
| $X_{10}$ | 0.006 | 0.026 | -.046 | 0.160 | 0.072 | 0.214 | 0.155 | 0.071 | 0.101 | 1.000 |

The correlation matrix was conducted in Table 3 to establish whether the predictors were suitable for the model. It therefore suggests no multicollinearity issues among the predictor variables because, the absolute values of the correlation coefficients are less than 0.31 ($|r| < 0.31$), a weak correlation between the independent variables [44]. Furthermore, the standard errors of the estimates, which range from 0.085 to 0.208 as shown in Tables 4 to 10, indicate precise estimates. This suggests that multicollinearity is not a concern in the analysis. This suggest that the variables are suitable for fitting the logit model.

**Table 4.**
Predictive logit model for auto-mechanical engineering.

| Predictor | Coef. | SE Coef. | Z | P | Odds Ratio | 95% CI Lower | 95% CI Upper |
|---|---|---|---|---|---|---|---|
| Constant | 1.255930 | 0.720394 | 1.74 | 0.08 | | | |
| Edu. Level | 0.020801 | 0.106018 | 0.20 | 0.84 | 1.02 | 0.83 | 1.26 |
| Fin. probl | 0.208991 | 0.087987 | 2.38 | 0.02 | 1.23 | 1.04 | 1.46 |
| Paren Influ | -0.361114 | 0.086933 | -4.15 | 0.00 | 0.70 | 0.59 | 0.83 |
| Peer Influ | 0.176708 | 0.109211 | 1.62 | 0.11 | 1.19 | 0.96 | 1.48 |
| Teach Influ | -0.395696 | 0.139819 | -2.83 | 0.01 | 0.67 | 0.51 | 0.89 |
| Acad Perf | -0.193140 | 0.105250 | -1.84 | 0.07 | 0.82 | 0.67 | 1.01 |
| Vocational Lim | 0.555290 | 0.126828 | 4.38 | 0.00 | 1.74 | 1.36 | 2.23 |
| Self-emplo | -0.568653 | 0.179078 | -3.18 | 0.00 | 0.57 | 0.40 | 0.80 |
| Self-motiv | -0.299356 | 0.188472 | -1.59 | 0.11 | 0.74 | 0.51 | 1.07 |
| Lucrative | -0.114366 | 0.091459 | -1.25 | 0.21 | 0.89 | 0.75 | 1.07 |

Table 4 provides some interesting insights into the factors that influence Ghanaians' decisions to pursue auto-mechanical engineering as a career pathway to entrepreneurial success. The model indicates that financial difficulties and limited job opportunities within the communities were positively associated with the selection of auto-mechanical engineering as a career. Conversely, parental and teacher influence, as well as a desire for self-employment, negatively impacted the likelihood of choosing this

trade relative to commercial driving. While educational level and peer influence did not significantly predict the outcome, they demonstrated a slight positive association with auto-mechanical engineering.

**Table 5.**
Auto-electrical engineering predictive logit model.

| Predictor | Coef. | SE Coef. | Z | P | Odds Ratio | 95% CI Lower | 95% CI Upper |
|-----------|-------|----------|---|---|------------|-------|-------|
| Constant | 0.897056 | 0.674238 | 1.33 | 0.18 | | | |
| Edu. Level | 0.208690 | 0.094291 | 2.21 | 0.03 | 1.23 | 1.02 | 1.48 |
| Fin. probl | 0.077660 | 0.087301 | 0.89 | 0.37 | 1.08 | 0.91 | 1.28 |
| Paren Influ | -0.580386 | 0.085277 | -6.81 | 0.00 | 0.56 | 0.47 | 0.66 |
| Peer Influ | 0.187139 | 0.103088 | 1.82 | 0.07 | 1.21 | 0.99 | 1.48 |
| Teach Influ | -0.465767 | 0.132230 | -3.52 | 0.00 | 0.63 | 0.48 | 0.81 |
| Acad Perf | 0.042416 | 0.105143 | 0.40 | 0.69 | 1.04 | 0.85 | 1.28 |
| Vocational Lim | 0.528436 | 0.120954 | 4.37 | 0.00 | 1.70 | 1.34 | 2.15 |
| Self-emplo | -0.037233 | 0.118231 | -0.31 | 0.75 | 0.96 | 0.76 | 1.21 |
| Self-motiv | -0.597714 | 0.185702 | -3.22 | 0.00 | 0.55 | 0.38 | 0.79 |
| Lucrative | -0.053281 | 0.086015 | -0.62 | 0.54 | 0.95 | 0.80 | 1.12 |

Table 5 introduces factors influencing the decision to pursue auto-electrical engineering as a career among respondents. Educational attainment and limited apprenticeship options within the communities emerged as significant positive predictors. Individuals with higher educational levels and residing in areas with few alternative job options were more likely to choose auto-electrical engineering, with respective odds ratios of 1.23 and 1.70. Conversely, parental and teacher influence, as well as self-motivation, negatively impacted the likelihood of selecting auto-electrical engineering, suggesting that these factors can deter individuals from this career path relative to commercial driving. It is crucial to note that only financial problems, peer influence, and academic performance demonstrated a positive association with the choice of auto-electrical engineering.

**Table 6.**
Catering predictive logit model.

| Predictor | Coef. | SE Coef. | Z | P | Odds Ratio | 95% CI Lower | 95% CI Upper |
|-----------|-------|----------|---|---|------------|-------|-------|
| Constant | -0.400462 | 0.722702 | -0.55 | 0.58 | | | |
| Edu. Level | 0.037164 | 0.113182 | 0.33 | 0.74 | 1.04 | 0.83 | 1.30 |
| Fin. probl | 0.350056 | 0.092767 | 3.77 | 0.00 | 1.42 | 1.18 | 1.70 |
| Paren Influ | -0.806032 | 0.104083 | -7.74 | 0.00 | 0.45 | 0.36 | 0.55 |
| Peer Influ | 0.319492 | 0.117771 | 2.71 | 0.01 | 1.38 | 1.09 | 1.73 |
| Teach Influ | -0.191999 | 0.155214 | -1.24 | 0.22 | 0.83 | 0.61 | 1.12 |
| Acad Perf | 0.010730 | 0.119777 | 0.09 | 0.93 | 1.01 | 0.80 | 1.28 |
| Vocational Lim | 0.149727 | 0.125180 | 1.20 | 0.23 | 1.16 | 0.91 | 1.48 |
| Self-emplo | -0.194634 | 0.138932 | -1.40 | 0.16 | 0.82 | 0.63 | 1.08 |
| Self-motiv | 0.304220 | 0.130993 | 2.32 | 0.02 | 1.36 | 1.05 | 1.75 |
| Lucrative | 0.053146 | 0.096312 | 0.55 | 0.58 | 1.05 | 0.87 | 1.27 |

Table 6 presents the results of a logistic regression model predicting the choice between catering and driving as career paths. Of the ten factors considered, only four significantly influenced this decision. That is, while financial problems, peer influence, and self-motivation are more likely (with odds ratios of 1.42, 1.38, and 1.36,) to choosing catering, parental influence negatively affected the decision to pursue catering. Individuals facing parental encouragement towards this career pathway are 0.45 times less likely to choose it. This means also that individuals who were either influenced by parents were more likely to choose driving instead of catering.

**Table 7.**
Masonry predictive logit model.

| Predictor | Coef | SE Coef | Z | P | Odds Ratio | 95% CI | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower | Upper |
| Constant | −0.417420 | 0.683525 | −0.61 | 0.54 | | | |
| Edu. Level | 0.334633 | 0.095770 | 3.49 | 0.00 | 1.40 | 1.16 | 1.69 |
| Fin. probl | 0.263141 | 0.092169 | 2.85 | 0.00 | 1.30 | 1.09 | 1.56 |
| Paren Influ | −0.573628 | 0.096320 | −5.96 | 0.00 | 0.56 | 0.47 | 0.68 |
| Peer Influ | −0.022144 | 0.110478 | −0.20 | 0.84 | 0.98 | 0.79 | 1.21 |
| Teach Influ | −0.417123 | 0.142965 | −2.92 | 0.00 | 0.66 | 0.50 | 0.87 |
| Acad Perf | −0.042307 | 0.112896 | −0.37 | 0.72 | 0.96 | 0.77 | 1.20 |
| Vocational Lim | 0.481221 | 0.126894 | 3.79 | 0.00 | 1.62 | 1.26 | 2.07 |
| Self-emplo | 0.029245 | 0.121964 | 0.24 | 0.81 | 1.03 | 0.81 | 1.31 |
| Self-motiv | 0.370499 | 0.125415 | 2.95 | 0.00 | 1.45 | 1.13 | 1.85 |
| Lucrative | −0.157790 | 0.097253 | −1.62 | 0.11 | 0.85 | 0.71 | 1.03 |

Table 7 presents the results of a logistic regression model predicting the likelihood of individuals choosing masonry as a career path. Six factors emerged as significant predictors. While educational level, financial problems, Limited apprenticeship options, and self-motivation positively influenced the decision to pursue masonry with respective odds ratios of 1.40, 1.30, 1.62, and 1.45, parental and teacher influence negatively impacted the choice of masonry, reducing the odds by 0.56 and 0.66, respectively. These findings suggest that while personal attributes and external factors such as limited apprenticeship opportunities can drive individuals towards masonry, parental and teacher support may be less influential in this career choice but rather to pursue commercial driving as a career path.

**Table 8.**
Carpentry predictive logit model.

| Predictor | Coef. | SE Coef. | Z | P | Odds Ratio | 95% CI | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower | Upper |
| Constant | 0.550110 | 0.623997 | 0.88 | 0.38 | | | |
| Edu. Level | 0.534074 | 0.087904 | 6.08 | 0.00 | 1.71 | 1.44 | 2.03 |
| Fin. probl | 0.297595 | 0.088237 | 3.37 | 0.00 | 1.35 | 1.13 | 1.60 |
| Paren Influ | −0.799340 | 0.095696 | −8.35 | 0.00 | 0.45 | 0.37 | 0.54 |
| Peer Influ | 0.260130 | 0.107943 | 2.41 | 0.02 | 1.30 | 1.05 | 1.60 |
| Teach Influ | −0.549058 | 0.136271 | −4.03 | 0.00 | 0.58 | 0.44 | 0.75 |
| Acad Perf | 0.014178 | 0.106271 | 0.13 | 0.89 | 1.01 | 0.82 | 1.25 |
| Vocational Lim | 0.119185 | 0.112007 | 1.06 | 0.29 | 1.13 | 0.90 | 1.40 |
| Self-emplo | 0.541817 | 0.105530 | 5.13 | 0.00 | 1.72 | 1.40 | 2.11 |
| Self-motiv | 0.143286 | 0.125361 | 1.14 | 0.25 | 1.15 | 0.90 | 1.48 |
| Lucrative | −0.514785 | 0.102126 | −5.04 | 0.00 | 0.60 | 0.49 | 0.73 |

Table 8 presents the results of a logistic regression model predicting the choice between carpentry and commercial driving as career paths. like previous models, seven of the ten variables significantly influenced this decision. Educational level, financial difficulties, peer influence, and a preference for self-employment were positively associated with the choice of carpentry, increasing the odds by factors of 1.71, 1.35, 1.30, and 1.72, respectively. Conversely, parental and teacher influence, as well as the perceived profitability of carpentry, negatively impacted the likelihood of choosing this trade. While academic performance, limited apprenticeship opportunities, and self-motivation did not reach statistical significance in this model, their potential influence on carpentry selection cannot be entirely dismissed.

**Table 9.**
Predictive logit model for sewing vocation.

| Predictor | Coef. | SE Coef. | Z | P | Odds Ratio | 95% CI | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower | Upper |
| Constant | 5.198150 | 0.686651 | 7.57 | 0.00 | | | |
| Edu. Level | 0.136894 | 0.108403 | 1.26 | 0.21 | 1.15 | 0.93 | 1.42 |
| Fin. probl | 0.202114 | 0.101075 | 2.00 | 0.04 | 1.22 | 1.00 | 1.49 |
| Paren Influ | -0.787773 | 0.112358 | -7.01 | 0.00 | 0.45 | 0.36 | 0.57 |
| Peer Influ | 0.106495 | 0.116973 | 0.91 | 0.36 | 1.11 | 0.88 | 1.40 |
| Teach Influ | -0.662465 | 0.143764 | -4.61 | 0.00 | 0.52 | 0.39 | 0.68 |
| Acad Perf | -0.328890 | 0.112942 | -2.91 | 0.00 | 0.72 | 0.58 | 0.90 |
| Vocational Lim | -0.258932 | 0.114986 | -2.25 | 0.02 | 0.77 | 0.62 | 0.97 |
| Self-emplo | 0.051103 | 0.144774 | 0.35 | 0.72 | 1.05 | 0.79 | 1.40 |
| Self-motiv | -0.501718 | 0.208149 | -2.41 | 0.02 | 0.61 | 0.40 | 0.91 |
| Lucrative | -0.178455 | 0.114822 | -1.55 | 0.12 | 0.84 | 0.67 | 1.05 |

Table 9 predicts the likelihood of individuals choosing sewing as a career path compared to commercial driving. It reveals that financial constraints significantly influenced individuals' decision to pursue sewing over commercial driving. While education, peer relationships, and self-employment aspirations showed a slight positive correlation with sewing, they did not significantly predict this career choice. Conversely, parental and teacher support, academic performance, limited job options, and personal motivation negatively impacted the likelihood of selecting sewing as a career path.

**Table 10.**
Predictive logit model for hairdressing.

| Predictor | Coef. | SE Coef. | Z | P | Odds Ratio | 95% CI | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower | Upper |
| Constant | 2.41051 | 0.598606 | 4.03 | 0.00 | | | |
| Edu. Level | 0.157245 | 0.092204 | 1.71 | 0.09 | 1.17 | 0.98 | 1.40 |
| Fin. probl | 0.263845 | 0.085303 | 3.09 | 0.00 | 1.30 | 1.10 | 1.54 |
| Paren Influ | -0.519488 | 0.087265 | -5.95 | 0.00 | 0.59 | 0.50 | 0.71 |
| Peer Influ | 0.076770 | 0.101768 | 0.75 | 0.45 | 1.08 | 0.88 | 1.32 |
| Teach Influ | -0.440567 | 0.132419 | -3.33 | 0.00 | 0.64 | 0.50 | 0.83 |
| Acad Perf | -0.189414 | 0.099353 | -1.91 | 0.06 | 0.83 | 0.68 | 1.01 |
| Vocational Lim | 0.005930 | 0.103430 | 0.06 | 0.95 | 1.01 | 0.82 | 1.23 |
| Self-emplo | 0.019978 | 0.116177 | 0.17 | 0.86 | 1.02 | 0.81 | 1.28 |
| Self-motiv | 0.324905 | 0.121602 | 2.67 | 0.01 | 1.38 | 1.09 | 1.76 |
| Lucrative | -0.267745 | 0.094107 | -2.85 | 0.00 | 0.77 | 0.64 | 0.92 |

Table 10 compares the choice of hairdressing and commercial driving. It indicates that financial constraints and personal motivation significantly influenced individuals' decision to pursue hairdressing. While educational attainment, peer influence, limited apprenticeship opportunities, and self-employment aspirations showed a positive correlation with hairdressing selection, these factors were not statistically significant. Conversely, parental and teacher support, as well as the perceived profitability of the trade, negatively impacted the likelihood of choosing hairdressing relative to commercial driving.

## 4. Discussion

This study investigated the factors influencing young Ghanaians' choice of informal apprenticeships as a pathway to entrepreneurial success. The findings revealed an interesting link between individual characteristics and career aspirations.

Interestingly, educational level positively correlated with the choice of traditionally male-dominated apprenticeships like auto-electrical and mechanical engineering, masonry, and carpentry. This suggests that individuals with higher education might see greater entrepreneurial potential in these skilled trades. However, for catering, sewing, and hairdressing - sectors often associated with female

entrepreneurs – educational background wasn't a significant factor. Aligned with previous research [21, 22]. Academic qualifications emerged as a critical determinant of career choices.

Financial constraints weren't a major determinant for choosing auto-electrical engineering but positively influenced choices for most other apprenticeships. These findings align with previous research showing that financial factors significantly influence career decisions [3-5]. This suggests that financial limitations might initially steer individuals towards most apprenticeships, but the specific trade chosen could be influenced by other factors such as entrepreneurial potential.

Surprisingly, parental and teacher influence negatively impacted the choice of most apprenticeships, except for commercial driving. That is, parents and teachers mostly influence individuals to pursue commercial driving. This could indicate a disconnect between traditional career guidance and the growing interest in entrepreneurship through apprenticeships. Perhaps, the immediate income earned by apprentices soon after commencing as "driver's mate" could be a motivating factor for parents.

Consistent with previous research [14-17, 43]. This study found that parental and teacher influence significantly impact career choices among youth. Similarly, Musset and Kurekova [17] the findings indicate a potential bias towards academic pursuits over apprenticeships, despite well-intentioned guidance from parents and teachers.

Peers and the desire for self-employment emerged as key drivers for choosing catering and carpentry. This suggests a potential entrepreneurial ecosystem within these trades, where individuals learn skills and build networks to eventually launch their own businesses [45]. Conversely, the "lucrative nature" of a career wasn't a significant factor for most choices, except for driving compared to hairdressing and carpentry. This might indicate a focus on acquiring practical skills and entrepreneurial independence over immediate high income.

However, academic performance of apprentices when they were in formal education played a minimal role in most apprenticeship choices, significantly influencing the choice of only commercial driving. This debunks the myth that apprenticeships are solely for underperformers. Individuals with diverse academic backgrounds are choosing apprenticeships, potentially for their entrepreneurial potential.

Furthermore, limited apprenticeship options in certain areas influenced choices towards driving rather than other trades. Individuals would have opted for other apprenticeships if they were available in their communities. This emphasizes the need for a more diversified range of apprenticeships or vocations that cater to local needs and entrepreneurial aspirations.

Also, self-motivation emerged as a significant factor, positively correlated with catering, masonry, and hairdressing, and negatively correlated with auto-electrical engineering and sewing relative to commercial driving. This suggests that individuals are drawn to these trades due to a strong entrepreneurial drive and a desire to build their own businesses.

Overall, the study underscores the complex decision-making process behind choosing informal apprenticeships. While financial considerations and educational background play a role, the desire for self-employment, entrepreneurial potential within specific trades, and limited job market options emerge as significant factors. These findings highlight the need for a shift in perception and support for informal apprenticeships as a viable pathway to entrepreneurship in Ghana.

## 5. Conclusions

This study explored the factors influencing young Ghanaians' choice of informal apprenticeships as a platform for entrepreneurial success. The findings reveal a dynamic interplay between individual characteristics, career aspirations, and the entrepreneurial ecosystem within specific trades.

While financial constraints remain a factor, the choice of apprenticeship appears to be driven more by the perceived entrepreneurial potential within a trade than immediate financial gain. This is particularly evident in traditionally male-dominated trades like auto-electrical and mechanical engineering, masonry, and carpentry, where individuals with higher education may see greater business

opportunities. Interestingly, educational background wasn't a significant factor for apprenticeships often associated with female entrepreneurs, suggesting a more open pathway for women in these sectors.

A surprising finding is the negative influence of parental and teacher guidance on most apprenticeship choices, except for commercial driving. This underscores a critical gap in career counselling that needs to be addressed to equip students with information on the entrepreneurial potential of informal apprenticeships.

The study highlights the role of peers and the desire for self-employment as key motivators for choosing catering and carpentry. This points to the existence of an entrepreneurial ecosystem within these trades, where individuals can learn skills and build networks to launch their own ventures. Interestingly, the "lucrative nature" of a career wasn't a major driver, suggesting a focus on practical skills and entrepreneurial independence.

Academic performance played a minimal role in most choices, further debunking the myth that apprenticeships are for underperformers. This opens apprenticeship pathways for individuals with diverse academic backgrounds who are interested in pursuing entrepreneurial goals.

Furthermore, the new variable (limitation of apprenticeship options) added to this study identifies this option in certain areas as a factor influencing career choices. This emphasizes the need for a more diversified range of apprenticeships that cater to local needs and entrepreneurial aspirations.

Finally, this research emphasizes self-motivation as a significant factor, particularly for individuals drawn to catering, masonry, and hairdressing. This suggests a strong entrepreneurial drive within these trades, where apprentices can build the skills and confidence to become self-employed.

This research supports the opinions held by some renowned researchers that parents and teachers have considerable influence on youth's decision-making process towards career choice and implications for the job market [15-18].

### 5.1. Theoretical Contributions

The study contributes to theories relating to entrepreneurial success stories by employing logit model in identifying and quantifying the factors that influence an individual's decision to enter an informal apprenticeship. This includes variables such as socioeconomic background, education level, parent and teacher influence, and availability of informal training options. By modelling the likelihood of opting for an informal apprenticeship over others, the logit model provides insights into the probability of such choices under varying conditions.

In addition, the logit model assumes that individuals choose informal apprenticeships based on utility maximization, meaning they select the option that provides the greatest perceived benefit. This framework is useful to explore what benefits or utilities (e.g., financial income, parent and teacher influence, self-motivation,) are most compelling in driving this choice.

The results from a logit model can help policymakers understand the conditions under which informal apprenticeships are attractive to youth. This can inform strategies aimed at either formalizing such apprenticeships or improving the attractiveness of alternative training and employment options. By understanding the factors that drive informal apprenticeship choices, the logit model can contribute to broader theories of labour market participation and informal sector development, particularly in contexts where formal employment opportunities are limited.

### 5.2. Managerial Significance

Through this study, managers can gain insights into the informal apprenticeship system as a critical method of skill acquisition. This understanding can help them identify potential recruits who have practical, hands-on experience and are well-prepared for entrepreneurial activities. Thus, by recognizing the value of informal apprenticeships, managers can identify and harness the skills of individuals who have been trained through these pathways. This can lead to the development of a more skilled and capable workforce, contributing to the overall success and competitiveness of the business.

### 5.3. Policy Implications

Policy wise, the insights from this study can help support and legitimize informal apprenticeship systems as a viable pathway to entrepreneurship, particularly in regions where formal education and training are less accessible. That is; by recognizing and formalizing the role of informal apprenticeships in entrepreneurial success, policies can be designed to empower more youth and individuals from disadvantaged backgrounds to engage in entrepreneurial activities, thereby promoting inclusive economic growth.

Also, as informal apprenticeships often lead to self-employment and small business creation, which are critical for job creation in developing economies like Ghana, policies that encourage and support informal apprenticeships can contribute to reducing unemployment rates and alleviating poverty.

In addition, policymakers can integrate informal apprenticeship models into national skill development programs, creating a structured pathway that supports the transition from apprenticeship to business ownership [46].

### 5.4. Formalization and Regulation

With regards to formalizing, insights from the study can inform policies aimed at standardizing and regulating informal apprenticeships to ensure quality training, fair working conditions, and the protection of apprentices' rights. Ghana Government could develop incentives for businesses and mentors to formalize informal apprenticeships, such as tax breaks, grants, or access to microfinance, which would help transition these apprenticeships into more structured and recognized forms of vocational training.

### 5.5. Cultural and Social Integration

Informal apprenticeships are often deeply rooted in the cultural fabric of societies. Policymakers can design programs that preserve and promote these cultural practices while integrating modern entrepreneurial and business management skills. Also, policies that support informal apprenticeship as a pathway to entrepreneurship can be part of broader youth empowerment strategies, helping to address issues of youth unemployment and social exclusion.

### 5.6. Limitation and Future Research Direction

One significant limitation of this study is the potential lack of generalizability beyond the specific cultural, economic, and social context of Ghana. Informal apprenticeships are deeply rooted in local traditions, norms, and socioeconomic conditions, which can vary widely across different regions and countries. As a result, the findings of this study may not fully apply to other contexts where informal apprenticeship systems operate differently or where the economic environment is not comparable to that of Ghana.

One key limitation of using the logit model is its assumption of the Independence of Irrelevant Alternatives (IIA). The IIA assumption implies that the relative odds of choosing between any two alternatives are unaffected by the presence or characteristics of other available choices. However, in the real-world context of informal apprenticeships and entrepreneurial pathways, choices may not be entirely independent. For instance, as a necessary condition in this research, it was assumed that the selection of an apprenticeship is independent of the selection of the other. However, the decision to pursue an informal apprenticeship might be closely related to or influenced by the availability and attractiveness of other options. This assumption may lead to inaccurate or biased estimates if the alternatives are not truly independent, which could limit the model's ability to fully capture the complexities of decision-making processes in this context.

To mitigate the limitations, future research could consider using other advanced models, such as the nested logit model or a weighted logit model, which allow for relaxation of the IIA assumption. These models may account for potential correlations between alternatives, providing a more accurate representation of the decision-making process in choosing informal apprenticeship pathways.

Also, future research could explore a comparative analysis of informal apprenticeship systems across different countries or regions. This could involve examining how variations in cultural practices, economic development levels, and government policies influence the effectiveness of informal apprenticeships as a pathway to entrepreneurial success. Comparative studies would provide a broader understanding of the role of informal apprenticeships in different contexts and could inform more tailored policy recommendations for diverse settings. Additionally, further studies could consider highlighting different realities such as, how high school dropout rates and youth unemployment influence apprenticeship career paths.

In conclusion, the logit model provides a robust theoretical framework for analysing the factors influencing informal apprenticeship choices, offering insights that are valuable for both academic research and practical policymaking. This study also contributes to a paradigm shift in the perception of informal apprenticeships towards intrapreneurial success in Ghana. It highlights their potential as a viable pathway to entrepreneurship, promoting self-employment and economic empowerment. Moving forward, this necessitates policy changes and stakeholder collaborations to create a more supportive environment for informal apprenticeships. This could include diversifying apprenticeship options, providing entrepreneurial guidance and training within apprenticeships, and fostering collaboration between formal education and informal apprenticeship systems.

### Institutional Review Board Statement:
Authors sort the consent of the individual respondents in the informal sector before administering the questionnaire as a basic requirement in Ghana.

### Transparency:
The authors confirm that the manuscript is an honest, accurate and transparent account of the study that no vital features of the study have been omitted and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

### Competing Interests:
The authors declare that they have no competing interests.

### Authors' Contributions:
The first author (GM) is responsible for the conception, initial draft, preparation, and analysis. The entire work was overseen and edited by the second author (CDN). The third author (EA) ran the data using the statistical program R, then prepared the results for the first draft. This fourth author (STY) validated the technique. After reading the published version of the manuscript, all writers have given their approval.

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