

Article

Auto-Rickshaw Repair, Servicing and Maintenance for Youth-in-Entrepreneurship in Kumasi

Prince Owusu-Ansah ¹, Abena Agyeiwaa Obiri-Yeboah ² , A. R. Abdul-Aziz ³, Saviour Kwame Woangbah ^{1,*}, Emmanuel Kwesi Nyantakyi ⁴ and Jack Nti Asamoah ²

¹ Automotive and Agricultural Mechanization Engineering Department, Kumasi Technical University, Kumasi P.O. Box 854, Ghana; prince.oansah@kstu.edu.gh

² Civil Engineering Department, Kumasi Technical University, Kumasi P.O. Box 854, Ghana; abena.obiri-yeboah@kstu.edu.gh (A.A.O.-Y.); jack.nasamoah@kstu.edu.gh (J.N.A.)

³ Statistical Sciences Department, Kumasi Technical University, Kumasi P.O. Box 854, Ghana; abdul-aziz.ar@kstu.edu.gh

⁴ Department of Civil Engineering and Environmental Engineering, University of Energy and Natural Resources, Sunyani P.O. Box 214, Ghana; emmanuel.nyantakyi@uenr.edu.gh

* Correspondence: saviour.kwoangbah@kstu.edu.gh

Abstract: Knowledge and skill acquisition is a driver to the socioeconomic growth of a country, yet economic challenges, rapid urbanization, and migration have contributed to youth unemployment in Ghana. The introduction of auto-rickshaws in 2015 has increased access coverage to transportation, augmented existing public transportation, and created avenues for both operators' and mechanics' employment through co-ordinated skill development actions to empower youth-in-entrepreneurship. However, these have not been fully utilized and developed by the Government. The study seeks to identify basic needs of auto-rickshaw mechanics in establishing a sustainable repair and maintenance enterprise, identify challenges confronting auto-rickshaw mechanics, and analyze activities of the youth who repair, maintain, and service auto-rickshaws within the formal and informal sectors for sustainable enterprises. The study is underpinned by both resource-based and human capital theories: education and apprenticeship bothers on human capital theory, while entrepreneurial experience, shop space, business duration, and so on projects the resource-based theory. Questionnaires were administered to 237 auto-rickshaw mechanics and interviews were conducted for some selected auto-rickshaw mechanics to investigate challenges in the business in the Kumasi Metropolitan Area through a clustered and systematic sampling technique. Data analyzed using SPSS v.26 indicated a very youthful auto-rickshaw mechanic population with low educational level that operates without licensed garages. About 68.8% of the mechanics possessed some form of apprenticeship training, though they are not specific to auto-rickshaw repair and maintenance. Further, 71.7% auto-rickshaw mechanics do not keep records of their activities and there is a general lack of entrepreneurial skills among them. Lack of financial support from financial institutions was found to be a major challenge. The binary logistic regression model retained and confirmed six out of the seven predictors, including sex, age, education, marital status, duration of repairs and/or maintenance, shop space, tools and equipment, and mechanical training, as significant contributing factors to entrepreneurship training offered to enterprises within the Kumasi metropolis. The study recommends the urgent need to upgrade the technical and entrepreneurial skills of auto-rickshaw mechanics through the establishment of targeted and result-oriented training centers for better efficiency. The authors further recommend financial institutions to consider giving financial support to auto-rickshaw mechanics to help sustain their businesses.

Keywords: youth-in-entrepreneurship; regression; unemployment; auto-rickshaw; repair



Citation: Owusu-Ansah, P.; Obiri-Yeboah, A.A.; Abdul-Aziz, A.R.; Woangbah, S.K.; Nyantakyi, E.K.; Asamoah, J.N. Auto-Rickshaw Repair, Servicing and Maintenance for Youth-in-Entrepreneurship in Kumasi. *Sustainability* **2022**, *14*, 8570. <https://doi.org/10.3390/su14148570>

Academic Editor: Fernando Almeida

Received: 15 May 2022

Accepted: 27 June 2022

Published: 13 July 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Human skill and knowledge acquisition through either formal or informal methods is the driving force for socioeconomic growth, which results in growth of a country. The use of the auto-rickshaw as a means of transportation has increased access (especially rural) to transportation in developing countries [1], and Ghana is no exception. Ghana has implemented co-ordinated activities for skills development aimed at empowering youth-in-entrepreneurship ventures in a bid to increase youth employment nationwide. The Government introduced auto-rickshaws in 2015 to alleviate challenges in Northern Ghana to create jobs for the teeming unemployed youth through the Microfinance and Small Loans Centre (MASLOC) amid the myriad transportation challenges. Since its inception, the initiative has spread throughout Ghana and is now widely accepted as part of the public transportation mix [2]. The auto-rickshaw has since been renamed as ‘yellow-yellow’, ‘Mahama can do’ in the north and ‘pragya’ in the south. Entrepreneurship in developing countries has the potential to improve and enhance economic development and create the right platform for sustainable environment for economic growth of a country [3–5]. Small and medium enterprises (SMEs) and entrepreneurship represent a complex mechanism and act as a carrier for employment development and innovation [6]. Thus, the concept of youth-in-SMEs and new businesses in an economy which involves entrepreneurial activities have the potential and capacity to increase innovation and invention.

The structure and complexity of entrepreneurial activities demand a much more extensive study on entrepreneurial idea and intent. The idea of entrepreneurship provides a key element in entrepreneurial research [3,7–10].

Auto-rickshaw as a means of urban transportation has received several varied reactions from the general public. The impact of auto-rickshaw transportation on society, the economy, and the environment has been extensively documented both locally and internationally. However, the engagement of the youth in repairing auto-rickshaws as a job opportunity has not been reported. In this study, we investigated the engagement of Ghanaian youth in the repair, servicing, and maintenance of auto-rickshaws as an entrepreneurship and job creation venture, and a means for sustainable job opportunities, livelihood enhancement, and the overall improvement of the socioeconomic development of sub-Saharan countries.

Findings in the study are expected to give information and policy direction to the government of Ghana on the possible prospects in the auto-rickshaw repair industry, emphasizing on the development of knowledge and skills of those engaged in the industry as a means of reducing unemployment among the youth. Following this section is the theoretical framework; this is followed by the literature review; and the next section contains the study areas and methods. The fourth section presents the results, which are followed by the discussion of the results and analysis. The last section of the paper outlines the conclusions and recommendations and policy implications, which also include recommendations for further studies.

2. Theoretical Framework

In-depth research is underpinned by contextualizing the same in a theoretical framework. The concept of presenting a theory which seeks to explain a peculiar issue and/or challenge is known as the theoretical framework [11]. It sums up the theory relative to a peculiar issue that has ensued based on previously identified knowledge regarding the factors involved. Thus, this study, which focuses on youth-in-entrepreneurship engaged in the repair and servicing of auto-rickshaws, is situated and guided by resource-based and human capital theories. These are contextualized in the subsequent sections.

2.1. Resource-Based Theory

The most common interest for social scientists and other related researchers has to do with the resource-based theory. According to Javed and [3], the resource-based standpoint of an enterprise connotes its capacity to deliver a reliable competitive upper hand if re-

sources are contained in a way that their results would not be imitated by other enterprises, which, in the long run, allows for a competitive barricade. Additionally, resource-based theories seek to explain that an enterprise's long-lasting competitive advantage is arrived at through a peculiar resource being atypical, valuable, nontradable, unreplaceable, and enterprise-specific [12]. A citation of this view was observed in another study [13]. Owing to resource-based theory, it is tenable to opine that past entrepreneurial evidence is a key resource to the auto-rickshaw enterprise. Largely, research has demonstrated that an entrepreneur's training skill contributes to the growth and performance of the enterprise. For purposes of employment and application to varied skill sets, the ability of the entrepreneur has been well documented. Some successes have been chalked by entrepreneurs based on their essential skills in the areas of sales, marketing, accounting, and servicing. Thus, this theory is applicable within the context of youth-in-entrepreneurship in the auto-rickshaw repair industry through apprenticeship training. For example, a youth entrepreneur in a mechanic workshop, can specialize in the repair and servicing of gearboxes and perfect the same such that it provides them with a competitive advantage over their competitors in the same market space. This is achievable based on recruitment of the best minds in the sector and/or apprenticeship mechanics to master in that area [14]. Thus, the theory underlines the survival and ameliorates performance in the repair and servicing of auto-rickshaws for youth-in-entrepreneurship.

2.2. Human Capital Theory

The theory on human capital was originated in 1961 by Schultz. This was subsequently expanded by [15] through an academic paper titled "Investment in Human Capital". In the said article, his perspective of the theory was introduced. This theory is also seen as one that hierarchically chronicles knowledge and skills [16]. Knowledge gained through training and skill both form capital, and that purposeful entrepreneurship growth was a product of capital, the authors of [17] asserted. Human capital concept means to invest in human beings using training and education. Schultz juxtaposes acquiring skills and knowledge to the acquisition of production. The disparity relative to incomes of people relate to the difference in accessing education and entrepreneurship. Thus, [17] asserted that investing in training and education links to an increase in entrepreneurial productivity, which, again, relates to a positive rate on returns and, hence, expansion of enterprises. The human capital theory has often been utilized relative to entrepreneurial training and capacity. The theory hypothesized that an entrepreneur with a high level of input should reflect the same in its output [18]. Hence, when an entrepreneur receives training with the requisite skills, it is anticipated that it leads to the creation of high-caliber enterprise of business ventures.

According to [19], human capital is applicable at both micro and macro levels. For the micro level, this theory indicates that individuals bear the cost of taking part in educating and/or training themselves with the view to obtain superior knowledge and skills that will increase their entrepreneurial abilities, be it repairs or services to be rendered. However, at the macro level, the focus is on entrepreneurial training, including apprenticeship and creation of fresh enterprise that will drive the disparity in marketing, repairs, servicing, and so on [20]. Therefore, this article, which focuses on youth-in-entrepreneurship for auto-rickshaw repair and servicing, has been shown to be underpinned by both resource-based and human capital theories. The study looked at, among other things, education and apprenticeship, which focus on human capital theory, while entrepreneurial experience, shop space, business duration, and so on project the resource-based theory.

3. Empirical Literature Review

3.1. Youth Unemployment and Employment in Ghana

A major challenge for the youth in urban areas in Ghana is the difficulty in finding suitable jobs. Prior to the onset of COVID-19, youth (defined by the United Nations as those persons between the ages of 15 and 24) were already three times more likely to

be unemployed compared to adults, while 126 million young workers were in extreme and moderate poverty worldwide [21]. This predicament now threatens to aggravate the already existing disparities within and between countries [22]. According to [23–25], the population of Africa is relatively young, with over half of the citizenry aged below 25 years. Africa's youth population between 10 and 24 years was estimated at 344.4 million as of 2013 and represents almost a third of the total population, making Africa the youngest continent in the world [2,3].

Several policies and efforts have been put forward by scholars and government aimed at increasing youth employment and employability on the African continent. For example, The African Union Agenda 2063 developmental plan is targeted at giving high priority to investing in youth as the driving force to realize socioeconomic development on the African continent [26]. However, [27] believe that the anticipated solutions should be based on comprehensive understanding of youth livelihood and employment authenticities if the desired impact is to be achieved. Youth unemployment is regarded as part of the labor force aged 15–24 years without work but available and searching for employment. The authors of [28] indicated that youth unemployment in Ghana stood between 12% and 50%, above general unemployment rates in sub-Saharan African countries. The report also concluded that youth unemployment challenges will intensify irrespective of major investments by both government and the private sector. This agrees with [29], who argued that, despite several economic reforms embarked on by successive governments, they have little impact on youth unemployment. Thus, [6] proposed the need to have disaggregated data on youth jobseekers by location, gender skills, and competencies to make informed policy and funding decisions for suitable and specific employment programs that tackle youth unemployment.

3.2. *The Auto-Rickshaw as an Avenue for Youth-in-Entrepreneurship in Ghana*

In 2015, the government of Ghana distributed auto-rickshaws to some youth to mitigate transportation challenges while solving the youth unemployment menace in the informal economy. Such initiatives to address youth unemployment have not been fully exploited. There are two types of motorized tricycles used in Ghana: the open bucket ("aboboyaa") and the auto-rickshaw ("yellow-yellow", "Mahama Can Do", "pragya"). The "aboboyaa" was introduced before 2015 to help farmers transport agricultural and other produce to market centers and other destinations, while the "pragya" is basically designed to carry passengers. Prior to 2015, repair and maintenance of the open bucket type were mostly carried out by mechanics who were already experienced in the motorcycle trade. The use of both tricycle types in Ghana has generated employment opportunities in tricycle assembling but most dealers do not offer after-sale service. The general lack of after-sale service has given rise to the youth offering repair and maintenance services to owners and operators alike [30]. The establishment of garages for repair and maintenance services of auto-rickshaws are mostly small-scale enterprises predominantly found in urban areas where tricycles are extensively used. Many small-scale enterprises have not been able to expand their businesses because of lack of entrepreneurial and technical skills, and logistics [31]. The short-term consequence is the likelihood of the enterprises to fold up and render many young people jobless.

Developing small-scale enterprises has been the focus of discussion among researchers and policymakers in many developing countries as an instrument to better the living conditions of its citizens [29,31]. A characteristic of the informal economy in developing countries is the spontaneous developed industrial or business clusters of mostly micro-, small-, and medium-scale enterprises (MSMEs) in manufacturing, repair services, and commercial activities, including sale of vehicle spare parts and accessories. Such clusters are populated by large numbers of operators, mostly youth [29,31]. In some newly advanced industrialized countries, clusters of industrial/business enterprises experience substantial growth in size and productivity but such success stories are limited in sub-Saharan Africa [32]. Results of some studies, cited in [32], for instance, seem to suggest that key determinants of

enterprise growth and survival include enterprise characteristics, such as enterprise age and size, entrepreneurial skills of the owner, human and social capital, years of schooling, years of business experience, and access to informal network, among others. To establish a small-scale enterprise, such as auto-rickshaw repair and maintenance workshop, the individual must possess the necessary technical skills to operate the enterprise and keep it in operation [33]. Auto-rickshaw mechanics face many challenges to ensure total customer satisfaction, such as low maintenance resulting from low material production quality, flawed designs, and lack of flexibility to maintain and repair.

Additionally, auto-rickshaw mechanics may have to cope with limited financial resources; inadequate work experience in the repair and maintenance of auto-rickshaws; poor infrastructural facilities (workshop and space); poor organizational management; lack of appropriate tools and equipment; and absence of genuine spare parts and consumables which end up affecting the quality of service rendered. The quality of repair and maintenance service provided depends on educational level of provider and could be enhanced through professional training and the provision of adequate modern tools, equipment, and infrastructure [34]. For a small-scale informal auto-rickshaw repair business, organizational performance is necessary for success and survival and is best implemented gradually as opposed to radical innovations [35,36] amid external factors, such as customer demand, business competition, government regulations, environmental consideration, and scarcity of resources. Innovation is greatly emphasized when improving and expanding customer-oriented services [37]. Given the present circumstances of globalization, auto-rickshaw mechanics have no option than to conform to standards in the repair and maintenance industry for the growth and survival of their businesses.

Some studies in Ghana [38–40] indicated that informal automobile mechanics without adequate formal education and technical skills cannot identify and use modern equipment, manuals, and technology, such as computers and internet, to complement their skills in the automotive industry. It is, therefore, necessary for auto-rickshaw mechanics to adapt and familiarize themselves with current and available technological trends to repair and maintain auto-rickshaws through knowledge acquisition and formal training. For an individual to establish a small-scale auto-rickshaw repair enterprise, the individual should have the basic tools, equipment, and workshop facility; technical and employability skills in automobiles or auto-rickshaws; managerial and entrepreneurship skills; and adequate financial resources. Figure 1 shows auto-rickshaw repair activities by youth without appropriate working tools and PPEs.



Figure 1. Auto-rickshaw repair being carried out by youth without appropriate working tools and PPEs.

Most auto-rickshaws are deployed in the urban and rural communities with poor road networks and frequent breakdowns which require regular maintenance. The study, therefore, seeks to identify basic needs of auto-rickshaw mechanics in establishing a sustainable repair and maintenance enterprise, identify challenges confronting auto-rickshaw mechan-

ics, and analyze activities of the youth who repair, maintain, and service auto-rickshaws within the formal and informal sectors for sustainable enterprises.

4. Materials and Methods

4.1. Study Area

Kumasi (Figure 2) is inhabited by over three million people, growing at 4.02% per annum, with huge economic potential that attracts lots of migrants from all over Ghana [41]. It is the second-largest city in Ghana and the administrative capital of the Ashanti Region. Kumasi is centrally located in a unique geographical area and is considered to be the hub of economic activities that stretch to other West African countries [42].

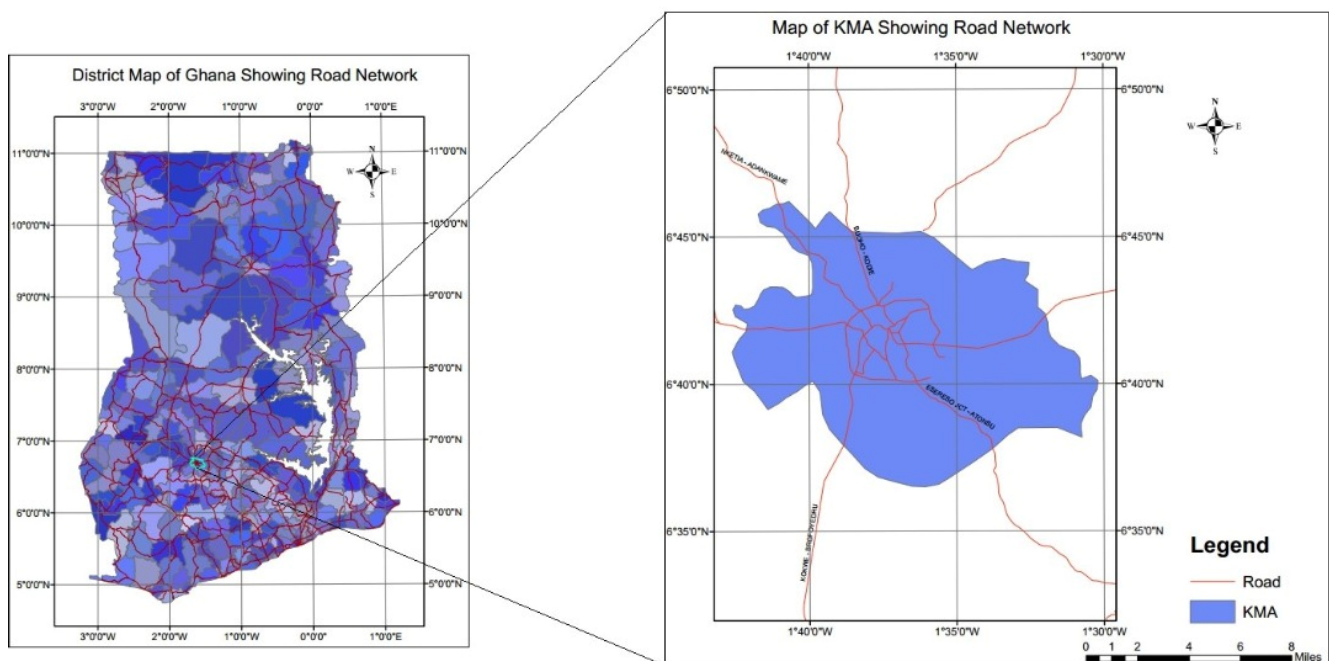


Figure 2. Map of Kumasi Metropolis showing some key road networks.

The transport terminal located at Kejetia is the pivot for most inter- and intra-city transportation. The transport terminals facilitate the distribution of goods and services within the country and in the sub-regions and encompass about 90 suburbs [42].

4.2. Study Approach

This research adopted a qualitative method and case study approach to survey the operations of auto-rickshaw mechanics in the Kumasi Metropolis. An exploratory field survey was conducted to identify auto-rickshaw mechanics operating in the Kumasi Metropolis. The research identified six communities within the metropolis considered as the hub of auto-rickshaw repair activities. The communities are Aboabo, Tafo, Suame, Moshie Zongo, Bantama, and Asawase. Table 1 shows the number of respondents interviewed.

Table 1. Communities selected for the research survey.

Identified Communities	Number Selected	Number of Respondents	Percentage
Aboabo	40	40	100
Tafo	40	40	100
Suame	40	39	97.5
Moshie Zongo	40	40	100
Bantama	40	38	95
Asawase	40	40	100
Total	240	237	98.75

In all, 98.8% of randomly selected tricycle mechanics responded to the close-ended questionnaires administered. Respondents answered questions on gender, age, educational level, marital status, maintenance activities, shop management, entrepreneurship, and record keeping. Respondents were interviewed in a language they were comfortable with, such as English only, local language only, or a blend. Questions were further explained to respondents' understanding to elicit their best responses. Additionally, group discussions were held for volunteered auto-rickshaw mechanics to investigate challenges in the business. Data were collated and analyzed using SPSS v. 26 and R v. 4.0.4.

4.3. Data Collection Instrument and Procedure

Based on the two theories, resource-based and human capital, used in the literature, the study utilized a questionnaire with a set of questions which reflected these theories relative to a youth's ability to be competitive and demonstrate knowledge and skills. Both closed and open-ended questions were adopted for the study. The respondents were probed on three main areas: demographic features, competitiveness (resource-based theory), and knowledge and skills (human capital theory) relative to auto-rickshaw repairs, servicing, and maintenance. The demographic factors included sex, age, educational background, and marital status. The competitiveness section comprised shop space or size, adequacy of tools and equipment used, maintenance records, servicing and repairs, and special tools. The section on knowledge and skills focused on how long a person has been engaged in the repair, servicing, and maintenance enterprise, formal mechanical training, and apprenticeship skills training received. This structured system was put in place to ensure proper data gathering and investigation of the theme under consideration.

4.4. Model Specification and Tests

The outcome variable in the binary logistic regression model is dichotomous, which assumes the values 1 (linked to probability of success, p) and 0 (associated with probability of failure, $1 - p$). Thus, it is deemed as a Bernoulli variable. Suppose the logistic function is called $f(z)$, then:

$$f(z) = \frac{1}{1 + e^{-z}} \quad (1)$$

To attain the binary logistic regression model from the logistic function, z is written as a linear sum as follows:

$$z = \alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k \quad (2)$$

where the x s are the predictors of interest to the researcher(s), while α and β_i are the intercept and the coefficients, respectively. Now, putting (1) into (2) yields the following:

$$f(z) = \frac{1}{1 + e^{-(\alpha + \sum \beta_i x_i)}} \quad (3)$$

The probability statement, $p(x)$, can replace $f(z)$ in (3), where x is the notation for x s and the expression then become:

$$p(x) = \frac{1}{1 + e^{-(\alpha + \sum \beta_i x_i)}} \quad (4)$$

To the extent that the binary logistic model is nonlinear, it is transformed through logit to make it linear, as given below:

$$\text{logit } p(x) = \ln_e \left[\frac{p(x)}{1 - p(x)} \right] \quad (5)$$

This transformation enables us to compute a number, known as $p(x)$, for a predictor variable given by x . Now, by substituting (5) into (4), the binary logistic regression model is obtained as follows:

$$\begin{aligned} \ln_e \left[\frac{p(x)}{1-p(x)} \right] &= \ln_e \left[\frac{1}{\frac{1 + e^{-(\alpha + \sum \beta_i x_i)}}{e^{-(\alpha + \sum \beta_i x_i)}}} \right] \\ &= \ln_e \left[e^{(\alpha + \sum \beta_i x_i)} \right] \\ &= \alpha + \sum \beta_i x_i \\ \text{Logit } p(x) &= \alpha + \sum \beta_i x_i \\ \therefore \text{Logit } p(x) &= \alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k \end{aligned}$$

For purposes of this study, the predictors were analyzed through dummies that facilitated the process. The dummies utilized for building the binary logistic regression model include sex (male = 1, female = 0), age (youth = 1, more than 45 years = 0), education (educated = 1, not educated = 0), marital status (married = 1, not married = 0), duration of repairs and/or maintenance (less than 5 years = 1, at least 5 years = 0), shop space (yes = 1, no = 0), tools and equipment (yes = 1, no = 0), mechanical training (yes = 1, no = 0), and keeping maintenance records (apprentice training = 1, no apprentice training = 0).

Subsequent to building the binary logistic regression model for this study, it was tested for its goodness of fit. To this end, the deviance test statistic given below was utilized:

$$d_i = \pm \sqrt{2 \left[y_i \log \left(\frac{y_i}{\hat{\pi}_i} \right) + (1 - y_i) \log \left(\frac{1 - y_i}{1 - \hat{\pi}_i} \right) \right]}$$

5. Results

5.1. Demographic Characteristics

5.1.1. Gender

A total of 225 (94.9%) males and 12 females (5.1%) completed the questionnaire (Table 1). The low number of females who took part in this study can be attributed to a low female population offering technical programs in Ghana [43].

5.1.2. Age

In Table 1, the majority of respondents involved in auto-rickshaw repair and maintenance are youthful. About 40.5% of the respondents were below 25 years, 29.5% were between 25 and 34 years, and 27.0% were between 35 years and 44 years.

The data in Table 2 show that 32.9% of the respondents have only attained basic education, while 22.4% do not have any formal education. Some 28.3% and 16.5% have attained secondary- and tertiary-level education, respectively. Low educational background makes it difficult for the mechanics to use modern sophisticated tools and equipment accurately and efficiently to diagnose faults and carry out repair and maintenance activities. Lack of formal education prevents mechanics from using information and technology tools, such as the internet, to learn about modern machines, tools, and equipment used in industry, as well as upgrade their skills using online platforms.

The research also indicates that 50.2% of respondents were single, 47.3% were married, 1.7% were divorced, and 0.8% were widowed. However, to remain in business and support a family, their activities must be properly streamlined to appropriate levels of sustainability.

Table 2. Demographic characteristics of respondents.

Characteristics		Frequency	Percent
Sex of respondent	Male	225	94.9
	Female	12	5.1
	Total	237	100.0
Age of Respondent	Less than 15 years	11	4.6
	15–24 years	85	35.9
	25–34 years	70	29.5
	35–44 years	64	27.0
	More than 45 years	7	3.0
	Total	237	100.0
The educational level of respondent	No formal education	53	22.4
	Basic	78	32.9
	Secondary	67	28.3
	Tertiary	39	16.5
	Total	237	100.0
Marital status of the respondent	Single	119	50.2
	Married	112	47.3
	Divorce	4	1.7
	Widowed	2	0.8
	Total	237	100.0

5.2. Operational Characteristics

Maintenance Practices

Table 3 indicates that 101 respondents representing 42.6% had been in the business of maintaining auto-rickshaws for less than 5 years, while 31.6% and 4.6% had done so for 5–10 years and some more than 20 years, respectively, indicating that more people are being introduced to the business in recent times. It is, however, noted that most respondents started with repair of bicycles and motorcycles before graduating to the repair of auto-rickshaws. This is evident in Table 4, as the majority (86.1%) of auto-rickshaw mechanics have had some formal education or apprenticeship training (training-on-the-job) or both before embarking on the repair and servicing of auto-rickshaws as a business.

Table 3. Maintenance practices.

		Frequency	Percent
How long have you been in the auto-rickshaw repair and maintenance business?			
Less than 5 years		101	42.6
5–10 years		75	31.6
10–15 years		35	14.8
15–20 years		15	6.3
More than 20 years		11	4.6
Total		237	100.0
Do you have a shop where you do your repair and maintenance work?			
Yes		178	75.1
No		59	24.9
Total		237	100.0
Do you have adequate tools and equipment that helps you to do proper maintenance and repair works?			
Yes		161	67.9
No		76	32.1
Total		237	100.0
Do you a keep maintenance records for future reference?			
Yes		67	28.3
No		170	71.7
Total		237	100.0

Table 4. Training acquisition.

	Frequency	Percent
What kind of training did you receive for your activities		
Formal education	35	14.8
Apprentice training	163	68.8
Both formal education and apprentice training	6	2.5
No formal and apprentice training	33	13.9
Total	237	100.0
Do you have any formal training in business management		
Yes	29	12.2
No	208	87.8
Total	237	100

Table 3 also indicates that 75.1% of respondents had a garage to carry out their activities, 67.9% of respondents had appropriate basic tools, such as bench vice, ring spanners, screwdrivers, set of spanners, set of screw drivers, offset spanners, Allan keys, and jack, while 32.1% had a toolbox containing most needed tools for their daily activities, which is encouraging. The researchers sought to find out whether the respondents kept records, such as basic book-keeping, fault, customer information, stock of spare parts, etc., but only 28.3% kept records for future reference.

A cross-tabulation between educational level and record keeping practices (Table 5) shows that 81.1% of mechanics with no formal education do not keep records of their maintenance activities, while 79.5% mechanics with basic education do not. Table 4 also shows record keeping being better with secondary- and tertiary-educated respondents, representing 35.8% and 43.6%, respectively.

Table 5. Cross-tabulation of educational level and record keeping.

		Do You Have Proper Maintenance Record for Future Reference?				Total
		Yes	%	No	%	
Educational level	No formal education	10	18.9	43	81.1	53
	Basic	16	20.5	62	79.5	78
	Secondary	24	35.8	43	64.2	67
	Tertiary	17	43.6	22	56.4	39
Total		67	28.3	170	71.7	237

Aside from education, the cognitive process of acquiring skills or knowledge, experience, and on-the-job training is equally important for mechanics. For this research, formal training is classified as training received in an educational institution relevant or related to mechanical engineering, and apprenticeship training as on-the-job training in any field related to mechanical engineering. People who taught themselves how to repair auto-rickshaws by observing or experimenting are classified as having no formal education or apprentice training.

Table 5 shows that 54% of respondents acquired some form of training as mechanics, while 46% did not acquire any training. Further, 14.8% of respondents were trained in the formal education system, 68.8% through apprenticeship training, and 2.5% had both formal and apprenticeship training. Most mechanics do not have business management skills.

It is evident from Table 6 that those who owned more repair and maintenance shops were those who had not been in the auto-rickshaw repair and maintenance business for long periods. This is surprising since it was expected that those who know the intricacies

of the business, have mastered the art and have built experiences would own more shops and vice-versa. The reason, however, could be economic rather than technical expertise.

Table 6. Cross tabulation of shop ownership and years of repair activities.

		Do Have a Shop Where You Do Your Repair and Maintenance Work?		Total
		Yes	No	
How long have you been in the auto-rickshaw repair and maintenance business	Less than 5 years	55	46	101
	5–10 years	64	11	75
	10–15 years	33	2	35
	15–20 years	15	0	15
	More than 20 years	11	0	11
Total		178	59	237

Although the informal sector economy has been identified as one that is easy to get into, it entails little capital and relatively little/no skills to start [44], but not so for some types of enterprises in the informal sector. Developing a new small- and micro-scale enterprise in the automotive sector is influenced by several factors, key of which is the inability to access and secure financial support from financial institutions for the start-up. Table 5 indicates 46 out of the 237 auto-rickshaw mechanics operating for less than five years without a garage to carry out their activities, yet all mechanics with over 15 years in operation own a garage or workshop.

According to [45], the main challenge confronting apprentices after completing their training is the lack of available space to establish a workshop of their own to begin operation. He further observed that lack of adequate provision by urban planners and managers for the integration of informal businesses into the urban space economy is a major weakness confronting local economic development in Ghana. This can be attributed to lack of financial support and poor spatial planning in some communities where these auto-rickshaws are extensively operated from.

An interview with some auto-rickshaw mechanics revealed that they lack financial resources and, therefore, appealed for loans at low interest rates to help them expand their businesses. The mechanics expressed their need for periodic training as new technologies emerge to help them diagnose faults and improve on their businesses. On employment, the mechanics strongly believed that the repair and maintenance of auto-rickshaws have created employment for them and called on the government to invest in them through space allocation and financing agreements so they can, in turn, create more jobs for the youth. During the discussion, lack of tools, equipment, logistics, and spare parts came up strongly as being difficult to come by and expensive where available.

Some comments from the mechanics during the discussion include:

“I suggest that if the authorities can also help us in the field of employment of skilled and trained students who can be able to read and write so that they can keep our records for us”.

“It will help us a lot if the government should allocate a dedicated space for motorcycles, Aboboyaa and Pragma mechanics to site”.

According to [46] in their final report to “Facilitation Services for Consultation on Motorcycles Operations in Ghana”, many reasons for and against the legalization and regularization of the use of auto-rickshaws were propounded. Some of the reasons for the legalization and regularization included the fact that they were convenient and flexible to use, provide a source of employment for the youth [47,48], provide a cheaper mode of transport in rural and urban areas, offer reduced travel time on bad and congested roads, are a potential source of revenue to the Government, are the only means of transport available in some rural areas, and their operation may engage the youth and prevent crime [46]. Ref. [46], however, opined that inadequate police personnel and resources to manage increased auto-rickshaws, potential increase in school dropouts, conflict and

threat to conventional transport modes, and disregard for road traffic regulations could serve as disincentives to their legalization and regularization. The authors believe that the Government must take steps towards the legalization and regularization of the operations of auto-rickshaws to enable the Government to provide better strategies for their management and monitoring.

Several mechanics were also concerned about gender representation in their line of work and indicated that government should encourage females who are interested in engineering to venture into the repair and maintenance of auto-rickshaws. Auto-rickshaw mechanics also believe that they need to protect their enterprise and entreated insurance companies to involve them in insuring their businesses. Those with shops pleaded for licenses to operate. Some auto-rickshaw mechanics also expressed concern about their safety and suggested that sidebars should be provided to protect passengers from falling. Work safety is also very key in the repair and maintenance industry and awareness creation on safety should be intensified, since most auto-rickshaw mechanics do not follow basic laid-down safety protocols during their repair activities.

5.3. Regression Model

From Table 7, the binary logistic regression model can be stated as follows:

$$\log\left(\frac{P(x)}{1-P(x)}\right) = -6143 - 3.566\text{Sex} - 1.223\text{Age} + 0.998\text{Ed} - 5.334\text{MS} - 2.657\text{DR} + 0.291\text{SS} + 0.823\text{TE} + 1.169\text{MR} + 1.215\text{MT} \quad (6)$$

Table 7. Binary logistic regression outcome.

	Estimate	Std. Error	Z-Value	Pr(> z)	Odds Ratio	C.I. for Odds Ratio	
						2.5%	97.5%
(Intercept)	−6.143	0.254	−2.022	0.02091	2.249	1.234	3.071
Sex	−3.556	0.201	−7.547	0.0000 ***	1.574	1.133	2.113
Age	−1.223	0.105	−4.871	0.0432	2.822	1.853	3.166
Education	0.998	0.118	1.442	0.0013 *	4.005	3.561	4.801
Marital status	−5.334	0.206	−39.101	0.0471	1.662	1.109	2.114
Duration of repairs	−2.657	0.227	−6.060	0.0000 ***	1.552	1.187	2.208
Shop space	0.291	0.192	2.016	0.0001 **	1.190	0.972	1.675
Tools and equipment	0.823	0.187	4.127	0.0001 **	0.823	0.355	1.021
Maintenance records	1.169	0.202	3.603	0.0653	0.779	0.485	1.127
Mechanical training	1.215	0.141	1.895	0.0021 *	1.697	1.232	2.044

NB: Signif codes: '***' 0.001 '**' 0.01 '*' 0.05.

From Table 7, an odds ratio of 1.574 (*C.I.* = 1.133 – 2.113) indicates that, for the explanatory variable sex, males have a higher likelihood of predicting entrepreneurs with formal business training than their female counterparts, holding the remaining factors constant. On age, respondents within the youth cohort were more likely, with an odds ratio of 2.822 (*C.I.* = 1.853 – 3.166), to receive formal business training than those who were outside the youth cohort (beyond 45 years), when other factors remain constant. Respondents who were educated, with an odds ratio of 4.005 (*C.I.* = 3.561 – 4.801), had a probability of receiving formal business training compared to those who had no formal education, holding other factors constant. Again, for the duration a respondent has been in the repair and maintenance enterprise, those who had spent less than five years were more likely, with an odds ratio of 1.552 (*C.I.* = 1.187 – 2.208), to undertake business training than their counterparts who had worked for at least 5 years. For operational shop space, youth entrepreneurs, with an odds ratio of 1.190 (*C.I.* = 0.972 – 1.675), who had access to shop space had a higher chance of impacting their receipts of formal business training compared to those without access to shop space. Respondents who had no adequate tools and equipment to operate recorded higher probability, with odds of 0.823 (*C.I.* = 0.355 – 1.021), of influencing their formal training in business against their counterparts who had adequate tools and equipment. Further, for keeping records of the maintenance being carried out, entrepreneurs who were not practicing records keeping recorded a higher likelihood,

with odds of 0.779 ($C.I. = 0.485 - 1.127$), of impacting their receipt of formal business training as opposed to those who keep records, given that all other variables remain constant. Additionally, with an odds ratio of 1.697 ($C.I. = 1.232 - 2.044$), entrepreneurs who went through mechanical training were more likely to undergo formal business training compared to those who had no form of mechanical training.

Meanwhile, six out of the seven factors considered as explanatory in the model were statistically significant. These include sex ($p < 0.0001$), age ($p < 0.05$), education ($p < 0.01$), marital status ($p < 0.05$), duration of repairs and/or maintenance ($p < 0.0001$), shop space ($p < 0.001$), tools and equipment ($p < 0.001$), and mechanical training ($p < 0.01$), which were each significantly influencing business training received by entrepreneurs. However, keeping maintenance records was not deemed as a significant ($p > 0.05$) contributing factor or explanatory variable relative to its influence on entrepreneurs' receipt of business training.

The deviance generally measures the extent to which the model equation (6) is properly fitted to the data set. The smaller the value of the deviance, the better the model. Thus, it can be opined from Table 8 that the residual deviance (139, $df = 135$) shows a proper fit for the model utilized in this study, and the same is emphasized when compared with the null deviance (201.14, $df = 137$), for which the model comprises only the intercept. Therefore, the outcome variable was generally well fitted relative to either when only the intercept or all the explanatory variables were included in the model. The AIC figure of 172.27 reinforces the fact that, to a high extent or degree, the model was well fitted as it yielded a small figure.

Table 8. Model indices.

Index	Value
Null deviance	201.14 on 137 degrees of freedom
Residual deviance	139.35 on 135 degrees of freedom
AIC	172.27

6. Discussion

The study has unraveled a couple of interesting and revealing findings which are worth highlighting and situating within the context of previous studies reviewed here. The study observed that most of the youth were engaged in the repair and maintenance services, especially those within the age groups 15–24 years and 25–34 years. This assertion is supported by [32,49], who opined that the youth are mostly engaged in the repair and servicing of auto-rickshaws. They noted that such entrepreneurial enterprises are mostly populated by the youth within the said age groups. Also, this finding was confirmed by [30], in which they noted that the general lack of after-sale service has given rise to the youth, who are often within the age group of 25–34 years, to offer repair and maintenance services to owners and operators of rickshaws. It is worth noting that two of the significant contributing factors, duration of repairs and servicing, as well as shop space, identified in this study contradict some previous studies, such as [29,31]. These studies found sales of vehicle spare parts and accessories as the two notable driving factors of youth engagement in repair and maintenance services. This contrast might have arisen because this study concerns auto-rickshaws, whereas [29,31] centered on vehicles.

In terms of the factors utilized in modeling this study, it was revealing to note that it agrees and disagrees with [32] relative to the predictor variables which were influencing youth-in-entrepreneurship and those which were not. For instance, this study identified sex as a significant factor, whilst [30] did not. However, in both studies, age and duration (years) of repairs were significant players to youth-in-entrepreneurship with formal training. Thus, the similarity may be attributed to the fact that small-scale enterprises were largely considered, whilst the contrasting views could be due to the application of dissimilar statistical methods and/or models. Also, mechanical training found by this paper to have immense influence on youth-in-entrepreneurship with formal training was in line with the

findings of [33], in which it was argued that small-scale enterprises, such as auto-rickshaw repair and maintenance workshop, require an individual to possess the necessary technical skills acquired through training.

Meanwhile, despite the youth-in-entrepreneurship solving unemployment challenges among the youth, the introduction of the auto-rickshaw servicing and its associated benefits to the youth is threatened by unintended consequences of school dropouts, and this contradicts [32], where they proposed that the key determinant of enterprise growth and survival includes characteristics of the entrepreneur, such as educational level. Interestingly, this study showed that record keeping was better with secondary- and tertiary-educated respondents. This confirms earlier studies by [34] that auto-rickshaw mechanics with basic education and specialized training can keep records of their activities, which will inure to their benefit. These have ensured successes in the repair and maintenance of their business activities.

It is, however, noted that most respondents started with repair of bicycles and motorcycles before graduating to the repair of auto-rickshaws. This agrees with the human capital theory as propounded by [17], who asserted that investing in training and education links to an increase in entrepreneurial productivity, which further relates to a positive rate on returns and, hence, expansion of the enterprise. This is evident in Table 5 as a majority (86.1%) of auto-rickshaw mechanics have had some formal education or apprenticeship training (training-on-the-job) or both before embarking on the repair and servicing of auto-rickshaws as a business. This human capital theory has often been utilized relative to entrepreneurial training and capacity.

Again, it was evident in this study that most of the respondents acquired some form of training as mechanics. Further, an appreciable number of respondents were trained in the formal education system, and the majority through apprenticeship training. Most mechanics do not have business management skills. This supports the human capital theory postulated by [17], which asserted that investing in training and education links to an increase in entrepreneurial productivity. The authors believe that informal training and business management acumen coupled with apprenticeship training will still yield a positive rate on returns and, hence, expansion of the enterprise. Therefore, the human capital theory can be utilized relative to entrepreneurial training and capacity building in the informal sector and experiential learning through apprenticeship training.

7. Conclusions

The study has established that the introduction of auto-rickshaws as a means of transportation has generated employment avenues for the youth in the automobile industry. Despite tackling unemployment challenges among the youth, the study has established that repair and maintenance of auto-rickshaws in Ghana is characterized by mechanics with low educational background, a phenomenon which, unchecked, has the potential to contribute to high school dropout rates among the youth. Most auto-rickshaw mechanics have received informal training, since mechanics do not have specific training to repair and maintain auto-rickshaws. In addition, lack of space to operate a shop/garage is a major challenge which hinders their growth and expansion. The study also established that lack of financing, adequate technical skills, and basic managerial skills may cause some businesses to fold up. The binary logistic regression model retained and confirmed six out of the seven predictors, including sex, age, education, marital status, duration of repairs and/or maintenance, shop space, tools and equipment, and mechanical training, as significant contributing factors to entrepreneurship training offered to enterprises within the Kumasi Metropolis. However, keeping maintenance records did not contribute significantly to entrepreneurship skills upgrade. This study concludes that there is an urgent need for skills upgrade and entrepreneurship development of tricycle mechanics, as well as financial support for them to sustain their business. There is also the need to create specialized training and training schools for tricycle repair and maintenance. This will make them relevant and contribute meaningfully to the economy.

8. Recommendation

8.1. Education and Training

Auto-rickshaw repair and maintenance is a recognized livelihood opportunity for the youth in Ghana; thus, the study recommends the following:

1. Formal training of auto-rickshaw mechanics must be inculcated into the educational system and the Technical and Vocational Education and Training (TVET) National Qualification Framework by the National Vocational Training Institute (NVTI) and the Commission for Technical and Vocational Education and Training (CTVET). Auto-rickshaw mechanics through the informal apprenticeship or experiential learning program can then be examined by NVTI and/or CTEVT to obtain qualification certificates that will make them employable in the formal sector and also give them an educational and career pathway.
2. Importers and dealers of auto-rickshaws in conjunction with technical education institutions and other organizations, such as manufacturers, should organize periodic training sessions to upgrade the knowledge of auto-rickshaw mechanics.
3. Basic training on business management, such as innovation and entrepreneurship, should be a mandatory part of the periodic training, as these skills are key to the survival of any business, especially in the informal sector.
4. The youth development policy should facilitate inculcating these skills in the youth by their integration into current education and training programs for a more effective implementation.

8.2. Financial Support

Microfinance and Small Loans Centre (MASLOC) was established by the Government of Ghana in 2006 to provide, manage, and regulate funds for microfinance and small-scale credit schemes for start-ups. Other financial establishments also exist to provide loans and credit schemes to start-ups and small and medium enterprises (SMEs).

1. It is recommended that MASLOC and other financial institutions should extend the credit facility to auto-rickshaw mechanics for easy access to funding to foster growth, expand businesses, and enhance job/wealth creation.
2. Further, MASLOC and other financial institutions should organize and train auto-rickshaw mechanics in financial, managerial, and entrepreneurship skills and monitor their progress for necessary advice.

8.3. Policy Implication

The findings from this study will inform government agencies and policymakers on the need to revisit the issue of the legalization and regularization of the operations of auto-rickshaws as a means of commercial transportation in Ghana. This will improve transportation access to rural areas where public transportation services are erratic. This calls for a review of existing policies and development of new ones in this regard.

Author Contributions: Conceptualization—P.O.-A. and S.K.W.; methodology—A.A.O.-Y. and A.R.A.-A.; validation—E.K.N. and A.A.O.-Y.; formal analysis—A.R.A.-A.; investigation, data—A.R.A.-A., writing—original draft—S.K.W.; writing—review and editing—A.A.O.-Y., P.O.-A., A.R.A.-A. and E.K.N.; resource—J.N.A. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki and the Publication of Research Ethics Policy of Kumasi Technical University.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

References

- Hegazy, M.M.; Slima, S. Pattern and Injury Severity of Auto Tricycle “Tok-Tok” Vehicles’ Accidents: One Year Prospective Study. *Egypt. J. Forensic Sci. Appl. Toxicol.* **2020**, *20*, 55–71.
- Obiri-Yeboah, A.; Ribeiro, J.; Asante, L.; Sarpong, A.; Pappoe, B. The new players in Africa’s public transportation sector: Characterization of auto-rickshaw operators in Kumasi, Ghana. *Case Stud. Transp. Policy* **2021**, *9*, 324–335. [\[CrossRef\]](#)
- Bakator, M.; Dorđević, D.; Čočkalović, D.; Vorkapić, M. Lean startups with industry 4.0 technologies: Overcoming the challenges of youth entrepreneurship in Serbia. *J. Eng. Manag. Compet.* **2018**, *8*, 89–101. [\[CrossRef\]](#)
- Crudu, R. The Role of Innovative Entrepreneurship in the Economic Development of EU Member Countries. *J. Entrep. Manag. Innov.* **2019**, *15*, 35–60. [\[CrossRef\]](#)
- Bruton, G.D.; Ahlstrom, D.; Obloj, K. Entrepreneurship in Emerging Economies: Where Are We Today and Where Should the Research Go in the Future. *Entrep. Theory Pract.* **2008**, *32*, 1–14. [\[CrossRef\]](#)
- Wellalage, N.H.; Fernandez, V. Innovation and SME finance: Evidence from developing countries. *Int. Rev. Financ. Anal.* **2019**, *66*, 101370. [\[CrossRef\]](#)
- Choi, Y.R.; Shepherd, D. Entrepreneurs’ Decisions to Exploit Opportunities. *J. Manag.* **2003**, *30*, 72–90. [\[CrossRef\]](#)
- Neneh, B.N. From entrepreneurial intentions to behavior: The role of anticipated regret and proactive personality. *J. Vocat. Behav.* **2019**, *112*, 311–324. [\[CrossRef\]](#)
- Thompson, E.R. Individual Entrepreneurial Intent: Construct Clarification and Development of an Internationally Reliable Metric. *Entrep. Theory Pract.* **2009**, *33*, 669–694. [\[CrossRef\]](#)
- Wilson, F.; Kickul, J.; Marlino, D. Gender, Entrepreneurial Self-Efficacy, and Entrepreneurial Career Intentions: Implications for Entrepreneurship Education. *Entrep. Theory Pract.* **2007**, *31*, 387–406. [\[CrossRef\]](#)
- Creswell, J. *Research Design: Qualitative, Quantitative, and Mixed Methods Approach*, 3rd ed.; Sage: Los Angeles, CA, USA, 2009.
- Gómez-Mejía, L.R.; Balkin, D.B.; Cardy, R.L. *Managing Human Resources*; Pearson Prentice Hall: Upper Saddle River, NJ, USA, 2007; p. 669.
- Grawhich, J.G.; Barber, L.K. *Are You Focusing Both Employees and Organizational Outcomes*; Organizational Health Initiative at Saint Louis University: Saint Louis, MO, USA, 2009; Available online: <https://paperzz.com/doc/7362203/are-you-focusing-on-both-employee-and-organizational-outc> (accessed on 5 May 2022).
- Nath, P.; Nachiappan, S.; Ramanathan, R. The impact of marketing capability, operations capability and diversification strategy on performance: A resource-based view. *Ind. Mark. Manag.* **2010**, *39*, 317–329. [\[CrossRef\]](#)
- Becker, G.S. Investment in Human Capital: A Theoretical Analysis. *J. Political Econ.* **1962**, *70*, 9–49. [\[CrossRef\]](#)
- Ucbasaran, D.; Westhead, P. Opportunity Identification and Pursuit: Does an Entrepreneur’s Human Capital Matter? *Small Bus. Econ.* **2008**, *30*, 153–173. [\[CrossRef\]](#)
- Schultz, T.W. Investment in Human Capital. *Am. Econ. Rev.* **1961**, *51*, 1–17.
- Davidsson, P.; Honig, B. The role of social and human capital among nascent entrepreneurs. *J. Bus. Ventur.* **2003**, *18*, 301–331. [\[CrossRef\]](#)
- Mulongo, G. *The Human Capital Theory in Education: Principles, Critiques and Current Thinking*; University of London, Institute of Education: London, UK, 2012.
- Lucas, R.E. On the mechanics of economic development. *J. Monet. Econ.* **1988**, *22*, 3–42. [\[CrossRef\]](#)
- International Labour Organization. *Global Employment Trends for Youth 2020: Technology and the Future of Jobs*. 2020. Available online: https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_737648.pdf (accessed on 13 May 2022).
- International Labour Organization. *World Employment and Social Outlook Trends 2022*; International Labour Office: Geneva, Switzerland, 2022.
- World Bank. *Youth Employment in Sub-Saharan Africa*; The World Bank: Washington, DC, USA, 2014.
- Population Reference Bureau. *The World’s Youth: 2013 Data Sheet*. 2013. Available online: www.prb.org (accessed on 8 January 2022).
- Adeniran, A.; Ishaku, J.; Yusuf, A. Youth Employment and Labor Market Vulnerability in Ghana: Aggregate Trends and Determinants. In *West African Youth Challenges and Opportunity Pathways, Gender and Cultural Studies in Africa and the Diaspora*; Palgrave Macmillan: London, UK, 2020. [\[CrossRef\]](#)
- African Union Commission. *Agenda 2063. The Africa We Want: A Shared Strategic Framework for Inclusive Growth and Sustainable Development & a Global Strategy to Optimize the Use of Africa’s Resources for the Benefit of All Africans*. 2015. Available online: https://au.int/sites/default/files/documents/33126-doc-01_background_note.pdf (accessed on 3 March 2022).
- The Mastercard Foundation. *Invisible Lives: Understanding Youth Livelihoods in Ghana and Uganda*; The Mastercard Foundation: Toronto, ON, Canada, 2017. Available online: https://1-ift.com/wp-content/uploads/2020/08/Report_YouthLivelihoods_Feb2017.pdf (accessed on 10 January 2022).
- World Bank. *Addressing Youth Unemployment in Ghana Needs Urgent Action, Calls New World Bank Report*. 2020. Available online: <https://www.worldbank.org/en/news/press-release/2020/09/29/addressing-youth-unemployment-in-ghana-needs-urgent-action> (accessed on 4 March 2022).
- Oppong, M.; Owiredu, A.; Churchill, R.Q. Micro and Small Scale Enterprises Development in Ghana. *Eur. J. Account. Audit. Financ. Res.* **2014**, *2*, 84–97.

30. Priye, S.; Manoj, M.; Ranjan, R. Understanding the socioeconomic characteristics of paratransit drivers and their perceptions toward electric three-wheeled rickshaws in Delhi, India. *IATSS Res.* **2021**, *45*, 357–370. [\[CrossRef\]](#)
31. Asare, R.; Akuffobe, M.; Quaye, W.; Atta-Antwi, K. Characteristics of micro, small and medium enterprises in Ghana: Gender and implications for economic growth. *Afr. J. Sci. Technol. Innov. Dev.* **2015**, *7*, 26–35. [\[CrossRef\]](#)
32. Iddrisu, A.; Mano, Y.; Sonobe, T. Entrepreneurial Skills and Industrial Development: The Case of a Car Repair and Metalworking Cluster in Ghana. *J. Knowl. Econ.* **2009**, *3*, 302–326. [\[CrossRef\]](#)
33. Robinson, J.P. Technical and Employability Skill in the work Place. *Workplace* **2000**, *5*, 1–3.
34. Baidoo, F.; Odum-Awuakye, G.A. Influence of Service Quality Delivery in the SMEs of the Motor Vehicle Repair Service Industry In Ghana. *Afr. J. Appl. Res.* **2015**, *1*, 440–452.
35. Farid, M.; Day, J.-D. Constructing Service Innovation Model for SMEs in Automotive Service Industries: A Case Study of Auto Repair Motorcycle in Makassar City. In Proceedings of the International Conference on Innovation, Management and Industrial Engineering, Kyoto, Japan, 10–11 November 2016.
36. Damanpour, F.; Walker, R.M.; Avellaneda, C.N. Combinative Effects of Innovation Types and Organizational Performance: A Longitudinal Study of Service Organizations. *J. Manag. Stud.* **2009**, *46*, 650–675. [\[CrossRef\]](#)
37. Kowalkowski, C.; Kindström, D. Service innovation in product-centric firms: A multidimensional business model perspective. *J. Bus. Ind. Mark.* **2014**, *29*, 96–111. [\[CrossRef\]](#)
38. Akpakpavi, M. Modern Automobile Vehicle Repair Practices in Micro, Small and Medium Scale Garages in Ghana. *Int. J. Sci. Technol. Soc.* **2014**, *2*, 216. [\[CrossRef\]](#)
39. Edunyah, I. Technology and modern automobile industry challenges and opportunities for roadside mechanic in Ghana. *Int. J. Sci. Res. Innov. Technol.* **2015**, *2*, 58–63.
40. Akuh, R. Assessing the Knowledge and Impact of Advanced Automobile Technology on Repair Business of Informal Automobile Mechanics in Ghana (Ho Municipality). *Int. J. Sci. Eng. Technol. Res.* **2019**, *8*, 71–78.
41. World Population Review. Kumasi Population. 2022. Available online: <https://worldpopulationreview.com/world-cities/kumasi-population> (accessed on 4 April 2022).
42. Wikipedia. Kumasi Metropolitan Assembly. 2021. Available online: https://en.wikipedia.org/wiki/Kumasi_Metropolitan_Assembly (accessed on 28 February 2022).
43. Appiah-Castel, M.V.D.; Lamptey, R.B.; Titiloye, K.; Pels, W.A. Female Enrolments in STEM in Higher Education: Trend Analysis from 2003–2018: KNUST as a Case Study. *Libr. Philos. Pract.* **2020**. Available online: <https://digitalcommons.unl.edu/libphilprac/4327> (accessed on 14 March 2022).
44. International Labour Office (ILO). *Employment, Incomes, and Equality: A Strategy for Increasing Productive Employment in Kenya*; ILO: Geneva, Switzerland, 1972.
45. Yankson, P.W.K. Accommodating Informal Economic Units in the Urban Built Environment: Petty Commodity Enterprises in the Accra Metropolitan Area, Ghana. *Third World Plan. Rev.* **2000**, *22*, 313–334. [\[CrossRef\]](#)
46. Afukaar, F.; Damsere-Derry, J. *Facilitation Services for Consultation on Motorcycles Operations in Ghana*; Building and Road Research Institute (Council for Scientific and Industrial Research) Research for Community Access Partnership (ReCAP): Kumasi, Ghana, 2019; Final Report.
47. Phun, V.K.; Kato, H.; Chalermpong, S. Paratransit as a connective mode for mass transit systems in Asian developing cities: Case of Bangkok in the era of ride-hailing services. *Transp. Policy* **2019**, *75*, 27–35. [\[CrossRef\]](#)
48. Oyedepo, O.J.; Fadugba, O.G.; Odesanya, J.O. The role of commercial motorcyclist on economic growth in developing countries: Akure township in focus. *Transp. Logist.* **2016**, *16*, 25–32.
49. Yankson, P.; Owusu, G. Youth Entrepreneurship in Auto Spare Parts Sales and Repair Service in Accra, Ghana. *Dev. Ctry. Stud.* **2015**, *5*, 4.