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Entrepreneurial Competencies Required by Technical College Products for Successful Entering into Fabrication and Welding Enterprise for Sustainable Development In Akwa Ibom State

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Abstract

This study focused on identifying entrepreneurial competencies required by technical college products for entering into fabrication/welding enterprises in Akwa Ibom state for sustainable development. Three research questions were developed and answered in line with the purpose of the study. Three hypotheses were formulated and tested at the probability of .05 level of significance. Survey research design was adopted for the study. The population of the study was 22 made up of 12 technical teachers and 10 workshop technologists in fabrication/welding section in all the technical colleges that offer fabrication/welding trade in Akwa Ibom state. The sampling was purposive because of the manageable size of the population. The instrument used for data collection was a 72 competencies structured questionnaire which was face validated by three experts. Split-half technique and cronbach alpha reliability method were adopted to determine the reliability of the competencies on the questionnaire. A cronbach alpha coefficient of .84 was obtained. Mean with standard deviation were used to answer the research questions while t-test statistic was used to test the hypotheses at 0.05 levels of significance. It was revealed that technical college products in fabrication/welding craft practice require all the 14 competencies in planning for establishing fabrication/welding enterprises, 46 competencies for processing of metals into finished products, and 12 competencies for marketing of fabrication/welding enterprises' finished products. It was recommended that the identified entrepreneurial competencies be used for retraining of technical college products for entering into fabrication/welding enterprise as entrepreneurs. Also, that entrepreneurship education centres should be established by Akwa Ibom State Government for retraining of technical college products in entrepreneurial competencies for sustainable development.

Keywords: Entrepreneurial competencies, Technical college products, Fabrication/Welding enterprise, Sustainable development.

Introduction

Fabrication and welding is the art of joining metal parts together by the use of heat or pressure. Thus fabrication and welding craft practice is a trade or occupation taught in technical colleges. The trade exposes students to the use of metals of various forms such as

sheet metals, rods, angle bars, flat bars, and plates of various sizes and thicknesses to manufacture domestic and industrial components, machines, systems, and household equipment for the service of man. However, fabrication and welding trade can also be learnt through apprenticeship training (out of school training). But the study of fabrication and welding in technical colleges exposes students to the theoretical and practical components of the trade thereby making technical college products more technically literates and productive to the society. This is in line with the view of the Federal Republic of Nigeria (FRN) (2004) which describes technical college as an institution designed to prepare students to acquire practical skills and basic scientific knowledge and attitudes for the world of work. Thus Robert and Udoh (2015) stated that technical college is an appropriate educational pathway that can provide relevant knowledge, skills, and competencies for employment and quality living among technical college products.

Technical college products are individuals who have completed a three year senior technical college education programme and are awarded the National technical certificate (NTC) in any of the fields in technical areas such as fabrication/welding craft practice, motor vehicle mechanics' work, and so on. While National and Business certificates (NBC) is awarded to those that did business subjects. Olaitan, Eze, and Ogbonnaya (2009) observed that secondary school and technical college products without being admitted into tertiary institutions or without job usually move into the cities in search of white collar jobs without success. The authors maintained that the absent of jobs may lead them to engage in anti social activities, such as stealing, drug abuse, robbery. This view is also shared by Robert (2016) who stated that the effect of unemployment among Nigerian youths with resulting incidences of poverty has given birth to various crimes and socio- economic instability. This is because many technical college products are lacking the necessary competencies in their field of study that could make them productive in their area of study.

One of the ways of overcoming this ugly trend is by empowering technical college products in fabrication and welding with the necessary competencies that would make them owners of fabrication and welding enterprises. Fabrication and welding enterprise is a composite unit of metal work industry that involves a group of skilled personnel in fabrication and welding and other related trade areas working together to achieve common goals. Fabrication and welding enterprise is relevant in many sector of the economy such as agro and allied industries, oil and gas industries, transport and housing among others. The

wide range of avenues enable individual participant in fabrication and welding enterprise as entrepreneur to create wealth to themselves and jobs to others.

Anayakoha (2006) defined entrepreneur as a person who takes or assumes risks, identifies business opportunities gather resources, initiates actions and establishes a business organisation to meet market opportunities. In this study, entrepreneur is an individual who

owns, manages and bears financial risks and benefits of fabrication and welding enterprise. Therefore technical college products in fabrication/welding should possess some entrepreneurial competencies to enable them become successful entrepreneurs.

Competencies are specific abilities an individual possesses which enable him/her to carry out a task successfully. Okoro (2007) identified entrepreneurial competencies in the area of planning, technical tasks, marketing, public relation among others. Thus entrepreneurial competencies in fabrication and welding enterprises are the integrated performance capabilities acquired by an individual for the purpose of achieving the objectives of fabrication and welding enterprise. Such objectives include wealth creation through asset acquisition that lead to sustainable development. Sustainable development has to do with one improving productivity, increase income and equitable access to employment among members of the society. Successful entrepreneurs in fabrication/welding enterprises are among those that can bring about sustainable development in the society. Therefore, technical college products require entrepreneurial competencies to be able to carry out tasks in the area of planning, processing of metal into finished products and marketing of the finished products for improved interest to become entrepreneurs in fabrication and welding enterprise.

Statement of the Problem

The major objective of technical college education is to provide individual with scientific knowledge, practical skills and attitudes that are necessary for the world of work. But it was observed by Olaitan (2004) that the inability of the Nigerian graduates to be gainfully employed was as a result of misplacement and misdirecting the intelligence and ability of the learner in the learning process. This has led to technical college products of fabrication/welding craft practice not to acquire the necessary competencies required to operate fabrication/welding enterprise as entrepreneurs. If this abnormally is not corrected, there will be continuous increase of unemployed products from technical colleges. Therefore, there is need to identify the competencies required to operate fabrication /welding enterprise hence this study.

Purpose of Study

The purpose of this study is to determine the entrepreneurial competencies required by technical college products for successful entering into fabrication and welding enterprises as entrepreneurs in Akwa Ibom State.

Specifically, the study will

1. determine entrepreneurial competencies required by technical college products for successful planning for entering into fabrication and welding enterprise.

2. determine entrepreneurial competencies required by technical college products for successful processing of metals into useful finished products in fabrication and welding enterprise.

3. determine entrepreneurial competencies required by technical college products for successful marketing of processed metal products of fabrication and welding enterprise.

Research Questions.

1. What are the entrepreneurial competencies required by technical college products for successful planning for entering into fabrication and welding enterprise?

2. What are the entrepreneurial competencies required by technical college products for successful processing of metals into useful products in fabrication and welding enterprise?

3. What are the entrepreneurial competencies required by technical college products for successful marketing of processed metal products of fabrication and welding enterprise?

Null Hypotheses

The following hypotheses will be tested at .05 level of significance.

1. There is no significant difference in the mean rating of technical college teachers and workshop technologists in fabrication/welding craft practice on the entrepreneurial competencies required by technical college products for successful planning for fabrication welding enterprise

2. There is no significant difference in the mean rating of technical college teachers of fabrication/welding craft practice and technologists of fabrication/welding enterprises on the entrepreneurial competencies required by technical college products for successful processing of metals into useful products in fabrication welding enterprise

3. There is no significant difference in the mean rating of technical college teachers of fabrication/welding craft practice and workshop technologists in fabrication/welding enterprises on the entrepreneurial competencies required by technical college products for successful marketing of processed metal products of fabrication/welding enterprise

Methodology

The study adopted survey research design. Survey research design according to Nworgu (1991) is a process used in obtaining data from a sample that are familiar with the

ideas relating to the objectives of the study. The study was carried out in Akwa Ibom State of Nigeria. The population for the study was 22 consisting of 12 technical teachers, and 10 workshop technologists of fabrication/welding craft practice in seven Government owned technical colleges that offer fabrication/welding craft practice. There was no sampling as the population was manageable. A 72 items structured questionnaire titled Questionnaire on Entrepreneurial Competencies in Fabrication and Welding (QECFW) was used to collect data from the respondents. The competencies items in each area had a 4 point rating scale of highly required, HR, Averagely required (AR), slightly required (SR) and not required (NR) with corresponding value of 4, 3, 2, and 1. The instrument was face validated by three university lecturers two from the Department of vocational education university of Uyo; and on from department of mechanical Engineering, Akwa Ibom State university, Ikot Akpaden. Split half technique and Cronbach alpha reliability were used to determine the internal consistency of the instrument which yielded a coefficient of 0.84.

Twenty two copies of the questionnaire were administered on the respondents. The entire 22 copies were retrieved and analysed. Data collected from the study was analyzed using weighted mean and standard deviation (SD) to answer the research questions, while t-test statistic was used to test the hypotheses at 0.05 levels of significance and at 20 degree of freedom. The arithmetic mean for the value was computed as 4 + 3 + 2 +1 = 10; 10/4 = 2.50. Therefore, any item with a weighted mean of 2.50 or above was regarded required while any item whose weighted mean is less than 2.50 was regarded as not required. Any item with standard deviation between 0.000 and 1.96 indicated that the respondents were not too far from the mean and from one another in their responses.

Any item whose t-cal is less than the t- table value of 2.09 indicates that there was no significant difference in the responses of the two groups of the respondents. Thus a hypothesis of no significant difference was upheld for such item. Any item whose t-cal value is greater than the t- table value of 2.09 indicated that there was a significant difference in the

responses of the two groups of respondents. Thus a hypothesis of no significant difference was rejected for that item.

Results

The results for the study was obtained from the research questions answered through data collected and analysed and Null hypotheses tested.

Research Question 1:

What are the entrepreneurial competencies required by technical college products for successful planning for entering into fabrication and welding enterprise?

Null Hypothesis 1:

There is no significant difference in the mean rating of technical college teachers and workshop technologists in fabrication/welding craft practice on the entrepreneurial competencies required by technical college products for successful planning for fabrication welding enterprise

Competencies in Planning

S/NO	Item statement	ẋ	SD	t-cal	t-tab	Remarks RQ	Remarks Ho
						Req	NS
1	Formulate specific objectives for fabrication /welding enterprise.	3.36	0.65	1.07	2.09	Req	NS
2	Review the objectives of enterprise based on the changes in market demand and supply.	3.10	0.68	0.67	2.09	“	“
3	Select suitable site for fabrication/welding enterprise	3.81	0.39	0.00	2.09	“	“
4	Decide on the type of metal products to produce based on the financial strength of the enterprise.	3.68	0.47	0.95	2.09	“	“
5	Decide on the sources of finance for fabrication/welding enterprise	3.36	0.65	0.34	2.09	“	“
6	Decide on the materials and equipment for fabrication/welding enterprise	3.72	0.45	1.00	2.09	“	“
7	Decide on various levels of personnel (skilled and unskilled) and number needed for the enterprise	3.13	0.63	-0.36	2.09	“	“
8	Make budget for the fabrication/welding enterprise	3.59	0.50	1.90	2.09	“	“

9	Draw schedule of activities for fabrication/welding enterprise	3.18	0.64	1.06	2.09	"	"
10	Decide on appropriate work ethics for personnel in fabrication/welding enterprise	3.36	0.49	1.48	2.09	"	"
11	Decide on appropriate records for fabrication/welding enterprise	3.45	0.50	1.41	2.09	"	"
12	Decide on inventory control systems in fabrication/welding enterprise	3.27	0.70	0.33	2.09	"	"
13	Decide on appropriate means for storage of items of the enterprise	3.59	0.50	1.90	2.09	"	"
14	Decide on appropriate sources of power for the enterprise (national grid/ personal source)	3.50	0.51	1.92	2.09	"	"

Key: RQ=Research question; Ho = null hypothesis; Reqrd = Required; NS = Not Significant

The data in table 1 revealed that the sixteen (14) entrepreneurial competency items had their mean ranged from 2.90 to 3.81. This indicated that each mean was above the cut off point of 2.50. The implication of this is that all the sixteen (14) items are required by technical college products in planning for establishing fabrication/welding enterprises. The items had their standard deviation ranged from 0.394 to 0.811, which indicated that the respondents were not far from the mean and were close to one another in their opinion.

The table also indicated that each of the 14 items in planning had its calculated t-value lower than t-table value of 2.086. This showed that there was no significant difference in the mean rating of the responses of teachers in fabrication and welding craft practice and managers of fabrication and welding enterprises on entrepreneurial benchmarks required in planning for fabrication /welding enterprises. Therefore, the hypothesis of no significant difference was upheld for the items.

Research Question 2:

What are the entrepreneurial competencies required by technical college products for successful processing of metals into useful products in fabrication and welding enterprise?

Null Hypothesis 2:

There is no significant difference in the mean rating of the responses of technical college teachers of fabrication/welding craft practice and technologists of fabrication/welding enterprises on the entrepreneurial competencies required by technical college products for successful processing of metals into useful products in fabrication welding enterprise

	Competencies in Processing Metal into Finished Products					Remarks	
	i Mathematical calculations and measurement Item statement						
						RQ	**Ho**
	Item statement	**$\dot{x}_1$**	**SD**	**t-cal**	**t-tab**	**Req**	**NS**
1.	Perform simple mathematical calculations	3.59	0.50	0.00	2.09	Req	NS
2	Read various measuring instruments	3.72	0.45	-0.51	2.09	"	"
3	Calculate volumes	3.31	0.56	-0.41	2.09	"	"
	ii General metal cutting processes						
4	Cut various thicknesses of metals with electrically/ mechanically operated machines	3.72	0.45	1.00	2.09	"	"
5	Cut various thicknesses of metals with electric arc	2.72	1.03	0.44	2.09	"	"
6	Cut various thicknesses of metals with gas flame	3.72	0.45	2.14	2.09	"	"
	iii General metal drilling processes						
7	Drill holes on various thicknesses of metals with manually operated drilling machines	2.77	0.00	-0.71	2.09	"	"
8	Drill holes on various thicknesses of metals with different types of electrically operated drilling machines	3.63	0.49	1.41	2.09	"	"
9	Counter bore holes on metals	2.81	0.90	1.52	2.09	"	"
10	Countersink holes on metals	2.72	0.93	1.46	2.09	"	"
	iv Assembling of parts for welding						
11	Interpret drawings/ welding symbols	3.40	0.66	1.40	2.09	"	"
12	Identify various weld joints	3.45	0.59	0.34	2.09	"	"
13	Prepare various weld joints	3.46	0.50	0.43	2.09	"	"
14	Provide appropriate root face and root gap for weld joints	3.68	0.47	1.49	2.09	"	"
15	Carry out tacking appropriately	3.90	0.29	1.49	2.09	"	"
16	Place work in appropriate welding positions	3.63	0.49	1.41	2.09	"	"
	v Arc welding						
17	Set current correctly	3.90	0.29	0.00	2.09	"	"
18	Select electrodes for a given job	4.00	0.00	0.00	2.09	"	"
19	Maintain correct arc length during welding	3.95	0.21	1.00	2.09	"	"
20	Ensure adequate penetration during welding	3.86	0.35	0.63	2.09	"	"
	vi Gas Welding and Cutting						
21	Select flames for various jobs	3.77	0.42	0.52	2.09	"	"
22	Select/apply fluxes correctly	3.68	0.47	1.49	2.09	"	"
23	Select appropriate filler rods for welding	3.77	0.42	0.00	2.09	"	"
24	Use appropriate angles for filler rod/ blowpipe	3.45	0.67	1.82	2.09	"	"
25	Weld metals with appropriate speed and accuracy	3.68	0.47	1.49	2.09	"	"
	vii General faults prevention /control in welds						
26	Apply different methods for controlling expansion	3.95	0.21	1.00	2.09	"	"

	and contraction in welds						
27	Identify/ control various defects in welds	3.81	0.39	0.00	2.09	"	"
	viii Finishing						
28	Clean weld surfaces free from spatters and other impurities	3.77	0.42	0.00	2.09	"	"
29	Dull edges and corners correctly	3.63	0.58	-0.40	2.09	"	"
30	Apply filler appropriately where necessary	3.13	0.71	0.31	2.09	"	"
31	Apply appropriate corrosion protective materials on metals	3.68	0.47	0.95	2.09	"	"
32	Carryout grinding with various electrically operated machines	3.50	0.51	0.00	2.09	"	"
33	Carryout filling hand files	3.50	0.51	-0.90	2.09	"	"
34	Carryout smoothening of surfaces with emery clothe	3.40	0.50	-0.91	2.09	"	"
	ix Riveting						
35	Carry out manual riveting (riveting using hammer)	3.40	0.50	0.00	2.09	"	"
36	Carryout riveting with machines	3.45	0.50	-1.38	2.09	"	"
	x Self –secured joints						
37	Carryout paned down joints	2.72	1.03	0.44	2.09	"	"
38	Carryout knock-up joints	2.81	1.00	-0.24	2.09	"	"
39	Carryout grooved joints	2.77	1.02	0.21	2.09	"	"
	xi Safety practices						
40	Select/ use appropriate safety wears	3.63	0.42	1.41	2.09	"	"
41	Observe all safety rules regarding machines/equipment operation	3.72	0.45	1.00	2.09	"	"
42	Observe safety rules regarding arc welding and cutting	3.77	0.42	1.63	2.09	"	"
43	Observe safety rules regarding gas welding and cutting	3.77	0.42	0.52	2.09	"	"
44	Observe safety rules regarding materials handling	3.77	0.42	1.63	2.09	"	"
45	Operate all workshop safety equipment and materials	3.77	0.42	0.52	2.09	"	"
46	Maintain personal hygiene	3.90	0.29	1.49	2.09	"	"

Key: RQ=Research question; Ho = null hypothesis; Reqd = Required; NS = Not Significant

The data in table 2 revealed that the 46 items had their mean ranged from 2.72 to 4.00. This indicated that their mean were all above the cut-off point of 2.50. These mean values indicated that the rest of the 46 items were entrepreneurial competencies required by technical college products of fabrication and welding craft practice for processing metals into finished products. Also the standard deviation ranged from 0.000 to 1.052, indicating that the respondents were not too far from the mean and from one another in their opinions.

The null hypothesis tested in table 2 also indicated that the 46 entrepreneurial competencies had their calculated t- values ranged from -1.382 to 1. 825 which were less than t- table value of 2.09 at 0.05 levels of significance and 20 degree of freedom. This indicated that there is no significant difference in the mean ratings of the responses of the two groups of respondents on the 46 entrepreneurial competencies required by technical college products for processing metals into finished products. With this result, the null hypothesis of no significant difference is upheld for the 46 entrepreneurial competencies.

Research Question 3:

What are the entrepreneurial competencies required by technical college products for successful marketing of processed metal products of fabrication and welding enterprise?

Null Hypothesis 3:

There is no significant difference in the mean rating of technical college teachers of fabrication/welding craft practice and workshop technologists in fabrication/welding enterprises on the entrepreneurial competencies required by technical college products for successful marketing of processed metal products of fabrication/welding enterprise

						Remarks	
	Competencies in Marketing of Finished Metal Products	$\dot{x}_1$	**SD**	**t-cal**	**t-tab**	**RQ**	**Ho**
	Item statement					Req	NS
1	Decide. appropriate market survey strategies	3.22	0.42	0.53	2.09		
						Req	NS
2	Apply appropriate advertisement programme of enterprise products	3.09	0.52	0.00	2.09	"	"
3	Identify cost of various metal products in the market	3.27	0.55	0.00	2.09	"	"
4	Grade the enterprise products according to designs	3.68	0.47	1.49	2.09	"	"
5	Fix appropriate prices for the products	3.40	0.50	0.00	2.09	"	"
6	Identify buyers according to their need/choice of products	3.00	0.81	-1.52	2.09	"	"
7	Use appropriate means of transporting the metal products to the buyers	2.77	0.97	0.00	2.09	"	"
8	Keep sales book/records for all the products	3.40	0.50	0.00	2.09	"	"
9	Balance the enterprise account at the end of each day	3.22	0.52	-0.44	2.09	"	"
10	Arrange for safe keeping/ banking of financial	3.5	0.51	-0.90	2.09	"	"

	proceeds from sales of enterprise products						
11	Select sales promotion strategies	2.95	0.89	1.26	2.09	"	"
12	Select/use appropriate communication skills	3.13	0.63	0.34	2.09	"	"

Key: RQ=Research question; Ho = null hypothesis; Reqrd = Required; NS = Not Significant

Data in table 3 showed that the 12 entrepreneurial competencies had their mean ranged from 2.77 to 3.68. This indicated that their mean were above the cut-off point of 2.50. This observation implies that all the 12 items are entrepreneurial competencies required by technical college products for successful marketing of processed finished metal products of fabrication/welding enterprise. The items also had their standard deviation ranged from 0.428 to 0.898. This implies that the respondents were not far from the mean and were close to one another in their opinions.

Similarly, data presented in table 3 also revealed that the 12 entrepreneurial competencies have their calculated t-values ranged from -1.520 to 1.493, which were less than t-table value of 2.09 at 0.05 level of significant and 20 degree of freedom. This indicated that there is no significant difference in the mean ratings of the responses of the two groups of respondents on the entrepreneurial competencies required by technical college students to market finished metal products for fabrication/welding enterprise. With this result, the null hypothesis of no significant difference was upheld for the 12 entrepreneurial competencies in marketing.

Discussion of Findings

The result of this study in table 1 showed that 14 entrepreneurial competencies were required by technical college products in fabrication/welding craft practice in planning for entering into fabrication/welding enterprise as entrepreneurs. The result of this study is in agreement with the opinion of Olaitan and Mama (2001) who stated that planning for an enterprise involves formulating specific objectives of the enterprise, drawing up programme plan, budgeting, procurement of inputs for the enterprise and so on. The result of the study is also in consonant with the opinion Alebiosu (2005) who stated that planning should have a broad outline for goals, policies and procedures that will accomplish the objectives of the enterprise including forecasting and developing budget plus establishing the organisational design and structure.

In Table 2, the result of the study revealed that 46 competencies were required by technical college products in fabrication/ welding craft practice for processing metals into finished products. The result agrees with the submission of Enete, Amusa and Eze (2009) who stated that cocoa yam processing means the altering of cocoa yam corms or cormels to

improve their quality towards profit making for livelihood. Thus processing of metals into finished products is the conversion of metals through various steps to useable state for sustainable living. Technical college products should be able to execute these steps with high level of competency for improved interest in venturing into fabrication/welding enterprises as entrepreneurs. The finding on processing of metals into finished products are in agreement with the opinion of Robert (2013) who identified activities of processing metals into finished products to include cutting, drilling, riveting, folding of metals, welding, filing, painting among others.

The result in Table 3 revealed that 12 competencies were required by technical college products in fabrication/welding craft practice in marketing products of fabrication/welding enterprise. The result agrees with the opinion of Aneke (2011) who outlined the activities involved in marketing of snail products to include market survey, sorting snails into sizes, fixing of prices for each group, advertising the snails in the local markets / media, keep sales records and so on. The opinions and submissions of these authors cited above helped to validate the results of the present study on entrepreneurial competencies required in fabrication/welding enterprises. In addition, the finding on the hypotheses revealed that there was no significant difference in the mean ratings of the responses of the teachers in fabrication/welding craft practice and workshop technologists in fabrication/welding craft practice section on the 72 entrepreneurial competencies required by technical college products for successful entry into fabrication/welding enterprises as entrepreneurs. This indicated that the professionals experience of the respondents in their respective occupations did not significantly influence their responses on the 72 competencies

required by technical college products in planning, processing, and marketing of fabrication/welding enterprises products in Akwa Ibom state.

Conclusion

In Akwa Ibom state, many technical college products in fabrication /welding craft practice are unemployed despite the wide range of opportunities available in welding trade. The reason for this unemployment is that this group of technical college products do not possess the required competencies for entry to fabrication/welding enterprises as entrepreneurs or at least as employees for a healthy living. The unemployment has resulted in anti social behaviours among technical college products and by implication among youths generally. Therefore, this study was carried out to identify the entrepreneurial competencies required by technical college products to become self employed and employers of labours for sustainable development in Akwa Ibom state. The study found out that 72 entrepreneurial

competencies were required by technical college products for successful entering into fabrication/welding enterprise as entrepreneurs.

Recommendations

Based on the findings, the following recommendations were made:

1. That the identified entrepreneurial competencies be used by organized private bodies for retraining of technical college products for entering into fabrication/welding enterprise as entrepreneurs

2. Entrepreneurship education centres should be established by Akwa Ibom State Government for retraining of technical college products for sustainable development.

3. The National Business and Technical Examination Board should incorporate the identified entrepreneurial competencies in their NTC curriculum to prepare prospective graduating students in fabrication/welding craft practice for entering into fabrication/welding enterprise as entrepreneurs

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