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Application of Metalwork Technology Education Skills in the Fabrication of Vertical Palm Kernel Nut Cracking Machine

Koku K. Obiyai (Ph.D) (Corresponding Author)
Department of Vocational and Technology Education Niger Delta University Yenagoa, Nigeria
Email: osemenees@gmail.com

Engr. Ayibakuro Songi
Works and Maintenance Department, Federal Polytechnic, Ekowe, Bayelsa State, Nigeria

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Abstract

The study examined the role of Vocational Skills in the construction of a Vertical Palm Kernel nut cracking machine. Descriptive research design was used. The population was Nineteen (19), which comprises of Five (5) instructors and Fourteen (14) NO 2 Mechanical Engineering Students of Federal Polytechnic Ekowe, Bayelsa State. The whole 19 was also used as the sample because it is relatively small; a questionnaire titled "Application of Vocational Skills in the Fabrication of Vertical Palm Kernel Nut Cracking Machine Questionnaire (AVSFVPKNCMQ)" was used for the data collection. Five research questions and hypothesis were raised for the study. Mean and standard deviation was used to analyze the data collected while t-fest was used to test the two-null hypothesis at 0.05 level of significance. Findings revealed that Vocational Skills such as Measuring Filling Cutting, Welding and Assembling are needed by students for the fabrication of the Vertical Palm Kernel nut cracking Machine. It also revealed the problems associated with cracking and supply-demand gap of Palm Kernel. It was therefore, recommended that government and Private Fabricating Firms should go into full production of cracking machines to aid in mass production of cracked shells and nuts from palm fruits to meet the needs of Pharmaceutical, Cosmetics as well as Food Processing Industries.

Keywords: Cracking machine; Fabrication; Palm kernel nut; Vertical; Vocational skills.

1. Introduction

One of Nigeria's main commercially viable agricultural products is palm kernels. It comes by breaking the nut and taking the shells off of the palm bunch fruit. Manual method of cracking the palm nuts is the most common traditional practices of obtaining the palm kernels in rural areas in Nigeria and these include:

1. Stone arrangement method, and
2. Mortar and pestle method

The aforementioned techniques are crude but are simplest as well as the easiest methods practiced in Nigeria by local youths and elderly women. The first approach was to crack the nuts to release the kernel by using the principles of impact force. Typically, this involves setting the six or seven nuts on a level stone, using a different stone as a hammer to break them open, and then manually pulling the nuts out of the shell. The stone arrangement is labour intensive and very slow with probable output of 50 kg kernel in a working day per worker. And hence, it cannot meet the demand for growing industries John, *et al.* [1], [2] and palm kernel oil (PKO) processing individuals in the locality. Additionally, the person the cracking the nuts are in endless threat of absent mindedly or unexpectedly striking their fingers on the stones [3].

Vocational education pertains to the facet of an educational curriculum that encompasses the acquisition of knowledge, honing of skills, cultivation of work habits, and fostering of positive attitudes, all with the aim of preparing individuals for the realm of professional employment. In the scholarly work authored by Wapmuk [4], vocational education is delineated as a meticulously designed programme aimed at equipping individuals with the necessary proficiencies to proficiently execute practical tasks. This programme is specifically tailored to cultivate a repertoire of skills and competencies that enable individuals to effectively navigate the realm of industrial and commercial occupations, thereby facilitating their productive functionality within these domains. In contrast, Daso [5] conceptualised vocational education as a meticulously crafted curriculum aimed at equipping learners with both theoretical and practical competencies, thereby facilitating the acquisition of essential skills, abilities, knowledge, values, understanding, and attitudes within the framework of a structured educational system. This integration of learners into society encompasses diverse domains, including agricultural education, business education, home economics education, computer science education, health education, and more, all with the ultimate objective of enabling individuals to sustain themselves financially.

The development of the cracking machine was undertaken with the intention of accommodating the diverse physical attributes inherent in the palm kernel varieties, namely Dura and Tenera. These attributes encompass a range of factors, including the varying sizes of the palm kernel nuts as well as the distinctions between the shell and the kernel. The arduous task of extracting the nuts from their protective shells has proven to be quite challenging. The process of fracturing palm nuts in order to liberate the kernel is an imperative stage that exerts a profound influence on the quality of the resultant oil. The utility of kernels only becomes apparent once they have been successfully extracted from their protective encasement. This pivotal stage is where vocational aptitudes come into play.

In the year 2021, an unidentified scholar put forth the notion that fabrication entails the construction of metallic frameworks through the utilisation of techniques such as cutting, bending, and assembling. The aforementioned process pertains to the augmentation of value through the intricate fabrication of mechanical components and structures derived from diverse raw materials. According to Bethe [6] findings, individuals who possess expertise in metal fabrication are aptly prepared to engage in entrepreneurial endeavours as well as contribute to sectors involved in the conception, construction, and installation of products derived from sheet, plate, and structural metals.

Skills can be elucidated as the cognitive and physical aptitude to execute a given occupation or undertaking with a level of proficiency that meets or surpasses the established criteria of acceptability. As per the scholarly work of Okorie [7], expertise can be defined as the aptitude to proficiently execute a given task or skill. Moreover, it is imperative to acknowledge that a skill embodies a meticulously structured series of actions executed with proficiency and often exhibiting a malleable yet methodical temporal arrangement. According to Njoku [8], the acquisition of a skill entails the manifestation of a consistent pattern of action, cognition, and conduct within a particular domain, such that the execution becomes second nature to the individual through repeated practice or established repute, thereby facilitating the attainment of excellence in any form of construction or fabrication.

Technology education is a special grade of vocational education, which can be distinguished from other vocational education programmes because it places more emphasis on mathematics and sciences. Onyeukwu [9] defined technology education as the acquisition of basic skills capable of transforming scientific knowledge to the solutions of practical societal problems.

Metalwork technology is an aspect of technology education that is geared towards leading an individual towards the attainment of practical and applied proficiencies, alongside fundamental scientific comprehension in the realm of metalwork. Furthermore, it is specifically oriented towards cultivating the capacities of individuals to thrive with efficacy and proficiency within the societal framework, thereby fostering their active participation in its progress and betterment.

This work therefore, will involve a critical examination of skills: measuring skills, cutting/marching skills, welding skills, filling skills and assembling skills.

1.1. Measuring Skills

These are skills needed for the measurement of one parameter or the other in the fabrication of the palm kernel nut cracking machine. An in-depth knowledge on these will ensure the achievement of the required dimension for the fabrication of the machine.

According to Linton [10], machining as a skill is the working with metals using machine like drill, press, planes and mills, etc. to take precise cut-away from the trench of metal so that the desired part remains. Ramesh [11], defined machining as the process of cutting tools to remove some amount of a piece, shape it for an intended use. The author also established that machining skills equipped individuals with the employability skills to be gainfully employed in any available opportunity in the industries.

1.2. Cutting/Marching Skills

These are the skills the worker needs to display: the ability to quickly and repeatedly adjust the control of a machine or other metal pieces to exact positions, as well as the dexterous ability to make precisely coordinated movements in grasping and manipulating small objects or metal pieces. In addition to the above-mentioned skills in the fabrication of the desired quality vertical palm kernel cracking machine, the operator or worker must possess the capacity to engage in physical tasks such as climbing, lifting, balancing, walking, and timely material handling that demand a significant amount of movement with the arms and legs as well as the whole body.

1.3. Welding Skills

These are abilities and knowledge required for the fabrication and joining of metals and equipment together to form an integral whole. Additionally, it is essential for the fusion of two metallic components in order to facilitate bonding at their initial boundary surface. Rogers [12] opined that welding skill is a skill in metal work technology that involves the art of joining metals to fabricate or assemble a product, using manual, semi-automatic and automatic welding equipment. To use the palm kernel cracking machine effectively, you need to have a lot of faith in your predictions about the weld parameter. This is important for making sure that the welded joints have the right amount of mechanical strength.

1.4. Filling Skills

These are abilities and knowledge required to fill different components. It involves several activities like the watching of gauges, dials and output to make sure a machine is working properly. These skills are also responsible

for running the machine. Operating the machine may be tasking and the task must be completely for many hours. This is especially important because injuries or accident may occur if the operator get distracted or fatigued [13].

1.5. Assembling Skill

These are the skills and knowledge required to construct a palm kernel nut cracking machine. The acquisition and mastery of this act is very important because it involves studying assembling instruction manual, gather component parts, tools and materials. According to Truity Psychometrics LLC [14], assemblers put together complex machines, for example, real detailed schematics and show how to assemble the machine. Once the parts are properly aligned, they are then connected with bolts and screws or welded or solder together. In fabrication and construction of a palm kernel nut cracking machine, quality control is of immense important throughout the assembly process in order to locate faulty components and errors in the assembly process. This will help in detecting problems before the machines are fabricated.

The skills mentioned above have different roles to play a major role in the fabrication of the desired machine.

1.5.1. Purpose of the Study

The major purpose of the study is to determine the application of vocational skills in the construction of vertical palm kernel nut cracking machine. Specifically, the study intends to determine the extent to which:

1. Measuring skills is applied in the construction of vertical palm kernel nut cracking machine.
2. Cutting/matching skills is applied in the construction of vertical palm kernel nut cracking machine.
3. Welding skills is applied in the construction of vertical palm kernel nut cracking machine.
4. Assembling skills is applied in the construction of vertical palm kernel nut cracking machine.

1.5.2. Research Questions

The following research questions guided the study:

1. What is the extent of relevance of measuring skills in the construction of vertical palm kernel nut cracking machine?
2. What is the extent of relevance of cutting/matching skills in the construction of vertical palm kernel nut cracking machine.
3. What is the extent of relevance of welding skill in the construction of vertical palm kernel nut cracking machine
4. What is the extent of relevance of assembling skill in the construction of vertical palm kernel nut cracking machine.

1.5.3. Hypotheses

The following null hypotheses was tested at 0.05 level of significance and used for the study:

1. There is no significant difference between mean response of instructors and students on the extent of relevance of measuring skills In the construction of vertical palm kernel nut cracking machine.
2. There is no significant difference between mean response of instructors and students the extent of relevance of cutting / matching skills in me construction of vertical palm kernel nut cracking machine.

1.5.4. Scope

The study is limited to the skills relevant m constructions of vertical palm kernel nut cracking machine

2. Materials and Methods

The study adopted a descriptive design. The population was 19 comprising of five (5) lecturers and fourteen (14) part 2 Mechanical Engineering students of Federal Polytechnic, Ekowe, Bayelsa State. The instrument for data collection was validated by three experts, one from Mechanical Engineering department of Niger Delta University, Bayelsa State and the two from Bori Polytechnic, Bori in Rivers State. The essence was to ensure clarity of content, coverage and suitability for use in carrying out the study. Their comments and inputs were noted and incorporated into the final draft that was used. Test-retest method was used to establish the reliability co-efficient which yielded and a score of 0.67.

The Instrument was administered by the researchers directly to the respondents. The data collected was analyzed using Mean and Standard deviation. While t-test was used to test the two null hypothesis at 0.05 level of significance. The instrument contains a total of 48 items. A five (5) point Likert scale was used which was graded as VGE (5), GE (4), ME (3), L-E (2) and VLE (I). Mean was used to answer the five research questions and any item that scores a mean value of 2.50 and above was regarded as accepted while any below 2.50 was regarded as rejected. In testing the null hypothesis, if the calculated value is greater than the critical value at 0.05 alpha level, the hypothesis of no significance difference is accepted but if on the contrary, the null hypothesis was rejected.

3. Area of the Study

The study was carried out in Federal Polytechnic Ekowe, Bayelsa State. The state is located in the Niger Delta Region of Nigeria. Bayelsa State is an oil rich region with little commercial activities and fishing activities.

4. Construction and Fabrication Technique

The fabrication and construction of vertical palm kernel cracking machine was arranged in stages:

1. The construction was carried out independently on each component.
2. Each part was produced using different method to achieve accurate result.
3. The hopper was produced from mild steel plate by cutting, making, welding and fitting process.
4. The students folded a thick steel pipe that is placed at a certain angle.
5. The technologist calculated the size and angle of the cracking chamber before installing on the machine.
6. They aided in constructing the stand and frames as a base stand of the machine.
7. The electrical appliance was installed on the base stand of the machine.
8. Steel blades were constructed and mounted in the cracking chamber.
9. The shaft was machined using the turning tool and fitted with shoulder for bearing.
10. The v-belt was connected as part of the pulley system.
11. Steel plate was folded and fitted and created as a cover for the cracking chamber.
12. The students fitted m the required bolt and nuts on the various part of the machine.

5. Data Analysis

Research Question 1: To what extent does the application of measuring skills relevant in the construction of a vertical palm kernel cracking machine?

Table-1. Response of Instructors on the Application of Measuring Skills Relevant in the Construction of a Vertical Palm Kernel Cracking Machine

S/NO	Items	VGE	GE	ME	LE	VLE	Mean	S0	Decision
1	Is skill of no parallax error required in using measuring instrument	3	1	1	-	-	4.40	1.98	Accepted
2	Skill of No parallax error required in using measuring instruments to standard cutting of parts or machine element	3	1	1	-	-	4.40	1.98	Accepted
3	The ability to transfer inside and outside dimensions unto standard measuring instrument required in cutting work	2	I	1	1	-	3.80	1.50	Accepted
4	Skill of precise setout of dimensions required in cutting / mating of work piece	4	1	-	-	-	4.80	2.29	Accepted
5	The ability to transfer inside and outside dimensions unto standard measuring instrument required in cutting work	5	-	-	-	-	5.00	2.45	Accepted
	Grand Mean						**4.48**	**2.04**	**Accepted**

Table-2. Response of Students on the Application of Measuring Skills Relevant in the Construction of a Vertical Palm Kernel Cracking Machine

S/No	Items	VGE	GE	ME	LE	VLE	Mean	SD	Decision
1	Is skill of no parallax error required in using measuring instrument	10	2	2	-	-	4.57	2.12	Accepted
2	Skill of No parallax error required in using measuring instruments to standard cutting of parts or machine element	8	2	2	2	-	4.14	1.67	Accepted
3	The ability to transfer inside and outside dimensions unto standard measuring instrument required in cutting work	10	2	2	-	-	4.57	1.87	Accepted
4	Skill of precise setout of dimensions required in cutting / mating of work piece	10	2	2	-	-	4.57	1.87	Accepted
5	The ability to transfer inside and outside dimensions unto standard measuring instrument required in cutting work	8	2	2	2	-	4.14	1.67	Accepted
	Grand Mean						**4.40**	**1.84**	**Accepted**

Findings obtained from table 1 on instructors' response revealed that item 1, 2, 3, 4 and 5 were all accepted to the various questions. Also, findings from table 2 on students' response revealed that item 1, 2, 3, 4 and 5 were all

accepted to the various questions. This indicates that skill of no parallax error, standard cutting of parts or machine element, skill of precise setout of dimensions and ability to transfer inside and outside dimensions into standard are required in using measuring instrument.

Research Question 2: To what extent is the application of cutting I mating skills relevant In the construction of a vertical palm kernel nut cracking machine?

Table-3. Response of Instructors on Application of Cutting/Mating Skills Relevant in the Construction of a Vertical Palm Kernel Nut Cracking Machine

S/No	Items	VGE	GE	ME	LE	VLE	Mean	SD	Decision
7	The ability of identification of mating dimension to degree specification required for proper cutting/mating of machine members	5	-	-	-	-	5.00	2.45	Accepted
8	Ability to select a hacksaw blade of the right type for varying jobs	4	1	-	-	-	4.80	2.29	Accepted
9	The ability of testing the straightness and flatness of work edges required in cutting mating of machine elements	-	1	1	-	-	4.40	1.98	Accepted
10	The ability of teeth setting of the saw blade required in the cutting / matching work	2	1	1	1	-	3.80	1.50	Accepted
11	The ability of making the right choice of grade of files required in cutting of nut cracker machine members	3	1	1	-	-	4.40	1.98	Accepted
	Grand Mean						**4.48**	**2.04**	**Accepted**

Table-4. Response of Students on Application of Cutting/Mating Skills Relevant in the Construction of a Vertical Palm Kernel Nut Cracking Machine

S/No	Items	VGE	GE	ME	LE	VLE	Mean	SD	Decision
7	The ability of identification of mating dimension to degree specification required for proper cutting / mating of machine members	8	2	2	2	-	-	1.67	Accepted
8	Ability to select a hacksaw blade of the right type for varying jobs	10	2	2	-	-	4.57	1.87	Accepted
9	The ability of testing the straightness and flatness of work edges required in cutting mating of machine elements	8	2	1	1	2	3.93	1.62	Accepted
10	The ability of teeth setting of the saw blade required in the cutting / matching work	10	2	2	-	-	4.57	1.87	Accepted
11	The ability of making the right choice of grade of files required in cutting of nut cracker machine members	8	2	-	-	2	3.86	1.72	Accepted
	Grand Mean						**4.23**	**1.75**	**Accepted**

Findings obtained from table 3 on instructors' response revealed that hem 7, 8. 9, 10 and 11 were ail accepted to the various questions. Also, findings from table 4 on students' response revealed that item 7, 8, 9, 10 and 11 were all accepted to the various questions. This indicates that the ability of identification of mating dimension to degree specification, ability to select a hacksaw blade of the right type for varying jobs, ability of testing the straightness and flatness of work edges, ability of teeth setting of the saw blade and ability of making the right choice of grade of files required in cutting of nut cracker machine members.

Research question 3: To what extent is the application of welding skills relevant in the construction of a vertical palm kernel nut cracking machine?

Table-5. Response of Instructors on Application of Welding Skills Relevant in the Construction of a Vertical Palm Kernel Nut Cracking Machine

S/No	Items	VGE	GE	ME	LE	VLE	Mean	SD	Decision
13	Ability to select the appropriate welding method required in the fabrication of nut cracker machine member	4	1				4.80	2.29	Accepted
14	Use the appropriate welding method	2	2	1	-	-	4.20	1.75	Accepted
15	use the control appropriate arc length/cutting required in welding	4	-	-	-	1	4.20	1.87	Accepted
16	Ability to choose the appropriate electrode required in the welding	3	1	1	-	-	4.40	1.98	Accepted
17	ability to strike and maintain arc required in welding of nut cracker machine members	2	2	1			4.20	1.75	Accepted
	Grand Mean						**4.36**	**1.93**	**Accepted**

Findings from table 3 revealed that item 13, 14, 15,16 and 17 were all accepted to the various questions. This indicates that the ability to select the appropriate welding method, use the appropriate welding method, use the control appropriate arc length/cutting, ability to choose the appropriate electrode and ability to strike and maintain arc required in welding of nut cracker machine members.

Research Question 4: To what extent is the application of assembling skills relevant in the construction of a vertical palm kernel nut cracking machine?

Table-6. Response of Instructors on Application of Assembling Skills Relevant in the Construction of a Vertical Palm Kernel Nut Cracking Machine

S/No	Items	VGE	GE	ME	LE	VLE	Mean	SD	Decision
19	Ability to select appropriate device for assembling and testing required in efficiency of assembled machine members	5	-	-	-	-	5.00	2.45	Accepted
20	The ability to select appropriate lifting equipment for alignment with respect to horizontal height required in the assembly of nut cracker shift and couplings	4	1	-	-	-	4.80	2.29	Accepted
21	The ability to test the straightness and roundness of finish surfaces with respect to centre distance required in the assembly of the nut cracker machine member	3	2	-	-	-	4.60	2.12	Accepted
22	The ability to provide the right type of seating for fasteners required in the assembly of nut cracker member	3	2	-	-	-	4.60	2.12	Accepted
23	The ability to carry out alignment for shaft, pulley, coupling, belt and chain required in the assembly of the nut cracker machine element	2	3	-	-	-	4.40	1.97	Accepted
24	**Grand Mean**						**4.68**	**2.19**	**Accepted**

Findings from table 3 revealed that item 19, 20, 21, 22 and 23 were all accepted to the various questions. This indicates that the ability to select appropriate device for assembling and testing, ability to select appropriate lifting equipment for alignment with respect to horizontal height, ability to test the straightness and roundness of finish surfaces with respect to centre distance, ability to provide the right type of seating for fasteners and ability to carry out alignment for shaft, pulley, coupling, belt and chain are required in the assembly of the nut cracker machine element.

Hypothesis I

There is no significant difference between mean response of instructors and students on the extent of relevance of measuring skills m the construction of vertical palm kernel nut cracking machine.

Table-7. t-Test Analysis of difference between Mean Response of Instructors and Students on the Extent of Relevance of Measuring Skills in the Construction of Vertical Palm Kernel Nut Cracking Machine

S/No	Items	N	Mean	SD	df	t-tab	t-cal	Decision
1	Instructors response on relevance of measuring skill	5	4.48	2.04	17	1.740	0.07	Not significant
2	Students response on relevance of measuring skill	14	4.40	1.84				

Findings from table 7 revealed that t-calculated value of 0.07 is less than t-tabulated value of J.740 at 0.05 level of significance. This implies that the null hypothesis was accepted. This means that there is no significant difference between mean response of instructors and students on the extent of relevance of measuring skills in the construction of vertical palm kernel nut cracking machine.

Hypothesis 2

There is no significant difference between mean response of instructors and students the extent of relevance of cutting/matching skills in the construction of vertical palm kernel nut cracking machine.

Table-8. t-Test difference between Mean Response of Instructors and Students the Extent of Relevance of Cutting/Matching Skills in the Construction of Vertical Palm Kernel Nut Cracking Machine

S/No	Items	N	Mean	SD	df	t-tab	t-cal	Decision
1	Instructors response on relevance of cutting skill	5	4.48	2.04	17	1.740	0.22	Not significant
2	Students response on relevance of cutting skill	14	4.23	1.75				

Findings from table 8 revealed that t-calculated value of 0.22 is less than t-tabulated value of 1.740 at 0.05 level of significance. This implies that the null hypothesis was accepted. This means that there is no significant difference between mean response of instructors and students the extent of relevance of cutting/matching skills in the construction of vertical palm kernel nut cracking machine.

6. Discussion of Findings

6.1. Vocational Skills in Fabrication

Findings from the study revealed that skill of no parallax error, standard cutting of parts or machine element, skill of precise setout of dimensions and ability to transfer inside and outside dimensions into standard are required in using measuring instrument. This is in line with the view of Fisher [15] requisite skills are needed to provide specific guidance to students to improve the accuracy, precision, and reliability of measurements.

Findings also show that the ability of identification of mating dimension to degree specification, ability to select a hacksaw blade of the right type for varying jobs, ability of testing the straightness and flatness of work edges, ability of teeth setting of the saw blade and ability of making the right choice of grade of files required in cutting of nut cracker machine members. This corroborates Bruce [16] viewpoint that the cutting skill is commonly employed in the realm of engineering, specifically for manipulating components that facilitate the production of flat metal sheets. These sheets are subsequently shaped through cutting techniques and further manipulated through folding methods to ultimately yield the desired final product. The peripheries are subsequently affixed through a diverse array of techniques, including welding, brazing, soldering, and riveting.

Findings also reveal that the ability to select the appropriate welding method, use the appropriate welding method, use the control appropriate arc length / cutting, ability to choose the appropriate electrode and ability to strike and maintain arc required in welding of nut cracker machine members. This is also in accordance with the perspective of Idris and Rajuddin [17], who conducted a study examining the significance and proficiencies of employability skills among senior TVET students in Nigeria. Moreover, it is worth noting that, according to the esteemed National Board for Technical Education [18], individuals who have successfully completed their studies in the field of fabrication and welding are expected to possess the capability to proficiently acquire and apply the necessary skills in the realm of gas welding and cutting, irrespective of the metal type. Additionally, they should be adept at producing uncomplicated yet refined structural steel work projects while prioritizing.

Further findings also show that the ability to select appropriate device for assembling and testing, ability to select appropriate lifting equipment for alignment with respect to horizontal height, ability to test the straightness and roundness of finish surfaces with respect to centre distance, ability to provide the right type of seating for fasteners and ability to carry out alignment for shaft, pulley, coupling, belt and chain are required in the assembly of the nut cracker machine element. The imperative to ascertain the qualifications of labourers is particularly pronounced for enterprises operating within the realm of special machinery. This is due to the fact that such companies necessitate workforces possessing a profound level of erudition and expertise, capable of proficiently executing intricate assembly procedures [19].

Findings also revealed that there is no substantial disparity among mean response of instructors and students on the extent of relevance of measuring skills in the construction of vertical palm kernel nut cracking machine. This is in line with the opinion of Fisher [15] that opined that both instructors and technician needs to be accurate in measurement skill utilization.

In addition, it was further revealed that there is no substantial disparity among mean response of instructors and students the extent of relevance of cutting / matching skills in the construction of vertical palm kernel nut cracking

machine. This also agrees with the opinion of Bruce [16] which opined that cutting skills should key to avoid material wastage.

7. Conclusion

In all, the study showed that vocational skills such as welding, cutting, measuring and assembling skills are needed by students for fabrication m engineering works.

Recommendations

The following recommendations were made from this study,

1. Based on the development of this machine, it would be recommended therefore that government and private fabricating firm should go into production of vertical palm kernel cracking machine to aid in mass production of cracked shells and nuts from palm fruits to meet the demand of industries and other areas.
2. Government and technical institutions at all level should engage students in practical and mass fabrication project related in palm kernel production to enhance students' skills.

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