European Journal of Educational and Development Psychology
Vol.7, No.3, pp.46-55, October 2019
Published by ECRTD-UK
Print ISSN: 2055-0170(Print), Online ISSN: 2055-0189(Online)

# MECHANICAL CRAFT PRACTICE TRADE FACILITIES AND COMPETENCIES REQUIRED FOR SOARING SUSTAINABLE NATIONAL PRODUCTIVITY IN RIVERS STATE

**Prof. Okwelle. P. Chijioke, Beako, Y.Tombari & Ojotule, I. Daniel**
Faculty of Education, Rivers State University, Nkpolu Oroworukwo, Port Harcourt. Nigeria.

***ABSTRACT****: The study investigated mechanical craft practice trade facilities and competencies required for soaring sustainable national productivity in Rivers State. Two research questions were posed and two hypotheses were formulated to guide the focus of the study. Population of the study consists of 33 respondents, comprising 18 teachers and 15 technical instructors from three government owned technical colleges and one Government Craft Development Centre in Rivers State. No sampling was taken considering the small size of the population. .Self-structured instrument titled "Mechanical Craft Practice Trade facilities for Sustainable National Productivity METFCSNP) was designed to elicit information from the respondents. Findings of the study include electronic parking brake, electronic sensors, modern actuators, electromechanical power steering system, oxygen sensor, oscilloscope multimeter among others are modern electronic gadgets expected in mechanical craft practice trade for soaring sustainable national productivity in Rivers State. Based on the findings, recommendations were made that; the government should provide modern electronic gadgets into mechanical craft practice section in technical college workshops for efficiency in practical training. That, the student of mechanical craft practice trade should be allowed to embark in industrial training in multinational oil industries to pave way for a universal learning in the institution and be familiar with modern electronic gadgets and tools in industry workshops.*

**KEYWORDS:** competencies, mechanical craft practice, soaring, sustainable national productivity

## INTRODUCTION

The society we live today is dynamic. The dynamic which stems from one fact events keep changing with respect to time. One has to develop up-to-date knowledge and present day realities. One of the present day's society is the lack of competencies and skills. Ryu (2017) stated that skills have become a leading policy concern and there is strong demand for upgrading skills and improving linkages between learning and work, in the background of demographic shift, rapid labour market changes and high youth unemployment in many countries. It is in this backdrop, Mojekwu, Uka, Nwabueze, Agbai and Ugwuegbulen (2017) asserted that technological expansion and integration into the educational system of a nation requires functional skills and competencies so that individuals can develop and be self-reliant and self-sufficient. Such skills are acquired in the technical colleges.

Nigeria has 132 technical colleges, 19 are owned by the Federal Government, 110 are owned by the State Government, and 3 are owned by the private individuals. Rivers State has four (4) technical colleges (National Board for Technical Education, 2014). Technical Colleges train and produce technicians for industries, impart vital technical skills in the youth and help towards realizing the goals of self-employment and job creation in the struggle towards

technological advancement and acquisition (Beako, 2017). The major goals of technical colleges are to produce efficient and relevant craftsmen that will promote industrial development in the areas of maintenances, production of goods and general services (Kama, 2018). Kama further declared that youth acquire such skills and become skilled technicians: Bricklayers, carpenters, painters, electrical installation and maintenance and mechanical craft practice trade.

Mechanical craft practice trade at the technical college level is made up of welding and fabrication, panel beating and car body works, air conditioning and refrigeration, Auto-electrical works, motor vehicle mechanic works among others. Individuals who acquire skills in any of this trades related areas can establish and manage their private businesses and generate wealth (Okeke & Eme, 2014). Mechanical craft practice trade is one of the trades in technical colleges in which students are examined by the National Business and Technical Examination Board (NABTEB) for the award of National technical Certificate (NTC) and the Advanced National technical Certificate (ANTC). Beako (2018) stated that mechanical craft practice trade is one of the severally recognized engineering fields that start from the practice of machine and mechanized processes, particularly concerned with power generation, transmission, utilization of tools and equipment. Okereke, Bello and Yakubu (2018) stated that modern machines and electronic sensors are fixed and useful in most modern cars today and it is mandatory to every craftsmen and women to identified and be familiar with it to avoid any form of accident. These machines include electronic parking brake, electronic sensors, modern actuators, electromechanical power steering system among others. Thomas (2013) stated that school workshops accommodate instructional materials such as electronic sensors, equipment, machines and consumables materials for practical activities. It's gears to produce an educated, skilled, motivated, dynamic workforce through soaring of a systematic and organized machines, tools and equipment used in training to improve national productivity and encourage competencies.

Competencies refer to those attributes which enable the application of skills, knowledge and attitudes in performing technical tasks in an occupation or profession. Being competent, implies that the person has acquired knowledge, skills and attitude required for performing successfully at a specified proficiency level in any given work. Alawa, Abanyan and Okene (2013) opined that competency is the successful performance of a task through the use of knowledge, skills, attitude and judgement. Alawa et al, further opined that competency is the state of being functionally adequate in the performance of one's duty. In this study, competency refers to the knowledge, skills and attitudes acquired by mechanical craft practice students to be actively functional in performing the task of diagnosis, maintaining, and servicing adequately the modern electronic gadgets in modern motor vehicles (electronic sensors, actuators) and application of modern tools and equipment, to diagnose and repair successfully in accordance with manufacturers specifications with view to soaring mechanical craft practice. Olaitan and Ikeh (2015) stated that competencies required to diagnosis modern machines in the technical college should involves ideas and knowledge that meet international standards to enhance competency, expertness and efficiency in term of acquiring practical knowledge needful and requires to operate machines in place of work. Wilcox (2013) stated that machines used in multinational oil industries and other place of work would help the students to easily adapt and mastery practical works at the various technical college workshops. If these students should acquires these competencies and explore after graduation, it expected that these

graduates will require to be competent, versatile and able to use machines and tools available in multinational oil industries, be employed or self-employed that would promote sustainable national productivity.

Sustainable refers to meeting the need and aspiration of the present without compromising the ability to meet those at the future generation (Obiajulu, 2018). According to Paul (2017) Sustainable can be referred to as a continual process that is geared towards restoring positive development and growth in a nation that has experienced depression. Improving mechanical craft practice facilities would bring about sustainable productivity that will expose the student's capacities and competencies to be familiar with modern machines, used modern electronic gadgets and equipment, repair modem machines in the workplaces and be exposed to contemporary issues in the mechanical industries. It is evident that most equipment such as tools and machines use for training which needs to be replaced and modernized where in a developed Countries, most of their machines are automated (Okwori, Bala, Ogbu, 2016). Most industries used modern apparatus to soaring capacities and competencies to improve productivity in a trade. Where these skills and competencies acquired help to diagnose, maintain and service modern vehicles and broadening the scope of their knowledge to be relevance and enhance sustainable national productivity. The national productivity will rise capacities through soaring.

Soaring refers to rising very quickly to a high level or great height. Merrian (2010) defined soaring as to ascend to a higher or more exalted level or to rise to majestic status. Oxford (2017) defined soaring as to rise or increase dramatically (as in position, value or price). In this context, soaring refers to rising up facilities and of machines, tools and equipment used in training students in mechanical craft practice to delivers quality instruction. Rising up mechanical craft practice facilities to this high, implies providing modern machines, equipment and tools, engage quality instructors and build standard equipped workshop suitable for training that will rapidly enhancing national productivity. Mechanical craft practice facilities will be exposed to the students where instrument used in the industry, also be used in teaching and learning in these college. Hence, its graduates will be versatile, relevant and contribute to the revenue base of the nation through taxes and productivity.

Productivity is the rate at which a worker, a company produces goods or deliver services adequately towards yielding desire results within specific time frame. Araoye (2016) defined productivity as doing the right thing, the right way, getting more output, punctuality and promptness, elimination of wastes in all forms, justifying your pay, improvement in all aspects of life, producing more of better quality. This implies that, staff personnel are essential in all organizations, especially the educational sector, the effective management of staff personnel no doubt has a great influence on productivity. In this study, productivity refers to the rate at which services are delivered, through the influence of modern electronic gadgets and equipment and material used for training in mechanical craft practice towards effective output. The knowledge acquired through mechanical craft practice facilities (modern electronic gadget and equipment) will bring and enhances regular output from graduates of this trade. This will enable them to diagnose, repair and operate machines easily, used modern electronic gadgets and equipment of any kind, and other lathe machines used in the multinational oil industries. Today's engine control systems are On-Board Diagnostic (OBD) second generation systems. Common to majority of the new trend is the brain box and other electronic gadget that sense

instant faults in the vehicle and immediately notifies the driver through the dashboard display. The modern trend of mechanical services therefore requires the use of more complex and highly technological specialty diagnostic equipment to analyse vehicle faults for repair and service (Babayo & Ismaila, 2018). Okwori, Bala, Ogbu (2016) stated that the government should strive to replace machines and tools in our technical college that are obsolete if we are to compete favourably with advance countries and keep with latest trend in industries. It is on this premise, the study mechanical craft practices trade facilities and competencies required for soaring sustainable national productivity in Rivers State was investigated.

**Statement of the Problem**

Graduates of mechanical craft practice trade are described as craftsmen and master craftsmen who are expected in the maintenance of all types of motor vehicles, machines, generators for the award of National Technical Certificate (NTC) and Advanced National Technical Certificate (ANTC) in technical colleges (NBTE, 2014). However, Okereke, Bello, and Adamu (2018) stated that these competencies and skills required for the repair and diagnosis of modern motor vehicles, machines and other sophisticated electronic devices is lacking. This situation had made graduates of mechanical craft trade irrelevant and not responsive in performing their legitimate duties of diagnosis and repair classic cars in the city where many vehicles are seen parked due to technical faults relating to electronic gadgets. Therefore, craftsmen required competencies and skills to diagnose and repair modern electronic gadgets, equipment, automated devices, such as diagnosis and repairs of electronic sensors, actuators, basic technology of modern motor vehicle, and fault diagnosis. It is in light of this foregoing, mechanical craft practice trade facilities and competencies required for soaring sustainable national productivity in Rivers State was carried out.

**Purpose of the Study**

The main purpose of this study is to examine mechanical craft practice craft trade facilities and competencies required for soaring sustainable national productivity in Rivers State. Specifically, the study sought to:

1. ascertain modern electronic gadgets expected in mechanical craft workshops for soaring sustainable national productivity in Rivers State.
2. determine competencies required of mechanical craft practice students to diagnose and repair modern electronic gadgets for soaring ssustainable national productivity in Rivers State.

**Research Questions**

The following research questions were posed to guide the study.

1. What are the modern electronic gadgets expected in mechanical craft workshops for soaring sustainable national productivity in Rivers State?
2. What are the competencies required of mechanical craft practice students to diagnose and repair modern electronic gadgets for soaring sustainable national productivity in Rivers State?

**Hypotheses**

The following null hypotheses ($H_0$) were formulated to guide the study and were tested at 0.05 level of significance.

**1.** There is no significant difference in the mean rating between Technical Teachers and Instructors on the modern electronic gadgets for soaring sustainable national productivity in Rivers State.

**2.** There is no significant difference in the mean rating between technical teachers and instructors on the competencies required of mechanical craft practice students to diagnose and repair modern electronic gadgets for soaring sustainable national productivity in Rivers State.

## METHODS

The study adopted descriptive survey design. The population of the study consists of 33 respondents. It comprised 18 teachers and 15 Instructors drawn from the three Rivers State owned technical colleges that offered courses in Mechanical Craft Practice (Government Technical College, Port Harcourt, 5 teachers and 4 instructors, Government Technical College, Eleogu, 3 teachers and 3 instructors, Government Technical College, Ahoada, 4 teachers and 3 instructors, Government Craft Development Centre Port Harcourt, 6 teachers and 5 instructors)(Field work, 2019). No sampling was taken considering the small and manageable size of the population. The instrument titled "Mechanical Craft Practice Trade facilities and Competencies Required for Soaring Sustainable National Productivity (METFCSNP) were developed for the study. The instrument was designed and patterned on five point rating scale of Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D) and Strongly Disagree (SD) with numerical values of 5, 4, 3, 2 and 1 respectively. Copies of the instrument were given to three experts. Two in the Department of Vocational and Technology Education, Rivers State University, Port Harcourt one from the Department of Measurement and Evaluation, Rivers State University, Port Harcourt for face validity. These experts vetted the instrument in terms of appropriateness, relevance and language level. Relevant observations made were incorporated into the work. Test-retest method was used to determine the reliability of the instrument. Cluster sampling techniques was used to draw a sample of 5 mechanical craft practice teachers and 5 Instructors which are not part of the population from Boys Technical College, Aba, Abia State. The instrument was administered, retrieved and analysed. Within an interval of three weeks, the same instrument was administered, retrieved and analysed. The results were correlated using Pearson Product Moment to determine the reliability coefficient of the entire instrument which yielded 0.87. The instrument was administered to the respondents alongside two assistants who were trained by the researchers. Thirty three (33) copies of the questionnaire were printed and distributed. However, 33 copies were retrieved and used for the study. The research questions were analysed using mean and standard deviation. The hypotheses were tested at 0.05 level of significance with Z-test statistical tool. Any item with a mean value equal to or greater than 3.50 was agreed while item with mean value less than 3.50 was not agreed. For the null hypotheses, if the value of Z- calculated is less than the value of Z-critical, the hypothesis was accepted. While if the value of the Z- calculated is greater than or equal to the value of the Z- critical, the hypothesis was rejected.

European Journal of Educational and Development Psychology
Vol.7, No.3, pp.46-55, October 2019
Published by ECRTD-UK
Print ISSN: 2055-0170(Print), Online ISSN: 2055-0189(Online)

## RESULTS

### Table 1: Mean and Standard Deviation of Respondents on the Modern Electronic Gadgets expected to Soaring Sustainable National Productivity

| S/N | Modern Machines Expected to Soaring Mechanical craft practice | Technical Teachers | | | Instructors | | |
|---|---|---|---|---|---|---|---|
| | | $X_1$ | $S.D_1$ | Remark | $X_2$ | $S.D_2$ | Remark |
| 1 | Electromechanical parking brake. | 4.01 | .94 | Agreed | 3.69 | 1.17 | Agreed |
| 2 | Electromechanical power steering system. | 3.62 | 1.19 | Agreed | 3.96 | .99 | Agreed |
| 3 | Electronic Sensors. | 3.79 | 1.14 | Agreed | 3.66 | 1.19 | Agreed |
| 4 | Electronic fuel injection(EFI)system | 3.69 | 1.10 | Agreed | 3.95 | .93 | Agreed |
| 5 | Modern actuators | 3.58 | 1.21 | Agreed | 3.71 | 1.17 | Agreed |
| 6 | Electronically braking system. | 3.98 | .95 | Agreed | 3.74 | 1.12 | Agreed |
| 7 | Electronic control system | 3.85 | 1.19 | Agreed | 3.68 | 1.10 | Agreed |
| 8 | Wheel speed sensor pulsers. | 3.78 | 1.15 | Agreed | 3.75 | 1.15 | Agreed |
| 9 | Crank position sensor. | 3.61 | 1.18 | Agreed | 3.94 | .87 | Agreed |
| 10 | A.C technology in modern vehicles. | 3.86 | 1.08 | Agreed | 4.02 | .93 | Agreed |
| **Grand Means and Standard Deviation** | | **3.78** | **1.10** | | **3.81** | **1.06** | |

Table 1 displays the mean values ranging from 3.78 to 3.81 which are all greater than the criterion mean of 3.50. This shows that the 10-items listed are agreed as modern electronic gadgets expected in soaring sustainable national productivity in Rivers State. The table further displays that the standard deviations of the respective items are within the ranges of .87 to 1.21, signifies that the mean values are not distant from each other. The results in Table 1 also indicate that the respondents agreed all the items as indicated on the table.

### Table 2: Competencies Required of Mechanical Craft Practice Students to Diagnosis and Repair Modern Electronic Gadgets for Soaring Sustainable National Productivity

| S/N | Competencies Required to Diagnosis and repair Modern Electronic Gadgets | Technical Teachers | | | Instructors | | |
|---|---|---|---|---|---|---|---|
| | | Mean | S.D | Remark | Mean | S.D | Remark |
| 11 | Conduct fault diagnosis on Distributorless Ignition System (DIS). | 3.97 | .92 | Agreed | 3.85 | 1.17 | Agreed |
| 12 | Conduct fault diagnosis on power sensor, reluctor sensor | 3.54 | 1.30 | Agreed | 3.99 | .99 | Agreed |
| 13 | Conduct fault diagnosis on Power Control Module (PCM) | 3.74 | 1.14 | Agreed | 3.76 | 1.19 | Agreed |
| 14 | Check and repair Electronic Diesel Control (EDC). | 3.84 | 1.10 | Agreed | 3.96 | .93 | Agreed |
| 15 | Conduct fault diagnosis on electronic sensors. | 3.70 | 1.21 | Agreed | 3.76 | 1.17 | Agreed |
| 16 | Check Windmill software for reading on board diagnostic data. | 3.95 | .95 | Agreed | 3.79 | 1.12 | Agreed |
| 17 | Conduct fault diagnosis on vehicle steering system. | 3.85 | 1.06 | Agreed | 3.85 | 1.10 | Agreed |
| 18 | Check and repair electromechanical parking brake system. | 3.83 | 1.09 | Agreed | 3.85 | 1.15 | Agreed |
| 19 | Conduct fault diagnosis on vehicle. | 3.78 | 1.18 | Agreed | 4.04 | .87 | Agreed |
| 20 | Check and repair DC and AC technology. | 3.86 | 1.06 | Agreed | 3.96 | .93 | Agreed |
| **Grand Means and Standard Deviation** | | **3.81** | **1.09** | | **3.58** | **1.06** | |

Table 2 reveals the mean values ranging from 3.81 to 3.58 which are all greater than the criteria mean of 3.50. This shows that all the items listed are agreed competencies required of mechanical craft practice students to diagnoses and repair modern electronic gadgets for soaring sustainable national productivity in Rivers State. The table further shows that the standard deviations of the respective items are within the range of .92 to 1.30, signifies that the mean values are not distance from each other. The results in Table 2 also indicate that the respondents agreed with all the items indicated on the table.

.

**Table 3: Z-test Analysis on the Responses of Technical Teachers and Instructors on Competencies Required of Mechanical craft Practice Students for Soaring**

| Respondents | X | S.D | N | df | ∝ | Z-cal | $Z_{cri}$ | Remark |
|---|---|---|---|---|---|---|---|---|
| Teachers | 3.81 | 1.06 | 18 | 31 | .05 | .0797 | +1.96 | Accepted |
| Technical Instructors | 3.78 | 1.09 | 15 | | | | | |

The information on Table 3 shows that z-calculated is .0797 while z-critical is 1.96. Based on the analysis, the value of z-calculated is less than the value of z-critical. This indicates that the null hypothesis is accepted, hence there is no significant difference on the mean rating of responses between teachers and technical instructors on modern electronic gadgets expected in mechanical craft practice workshops for soaring sustainable national productivity in Rivers State.

**Table 4: Z-test Analysis on the Responses of Technical Teachers and Instructors on Competencies Required for Soaring Sustainable National Productivity**

| Respondents | X | S.D | N | df | ∝ | Z-cal | $Z_{cri}$ | Remark |
|---|---|---|---|---|---|---|---|---|
| Teachers | 3.81 | 1.10 | 18 | 31 | .05 | .2763 | +1.96 | Accepted |
| Technical Instructors | 3.70 | 1.17 | 15 | | | | | |

The information on Table 4 shows that z-calculated is .2763 while z-critical is 1.96. Based on the analysis, the value of z-calculated is less than the value of z-critical. This indicates that the null hypothesis is accepted, hence there is no significant difference on the mean response between teachers and technical instructors on the competencies required to diagnose and repair modern electronic gadgets for soaring sustainable national productivity in Rivers State.

## DISCUSSION

The finding of this study revealed that all the items listed are modern electronic gadgets expected in mechanical craft practice trade workshop for soaring sustainable national productivity in Rivers State. The findings include electronic parking brake, electronic sensors,

modern actuators, electromechanical power steering system, oxygen sensor, oscilloscope multimeter. The finding agreed with the opinion of Okereke, Bello and Yakubu (2018) who stated that modern electronic gadgets are fixed and useful in most modern cars today and it is mandatory to every craftsmen and women to identified and be familiar with it to avoid any form of accident. These machines includes electronic parking brake, electronic sensors, modern actuators, electromechanical power steering system among others would help in the training of students in mechanical craft practice workshops of technical colleges for sustainable national productivity in Rivers State. These machines are needed for training at the technical college workshops and should be made available to technical colleges for training in Rivers State. These will serve as instructional materials and will aid both teachers and technical instructors to achieve their desired goals and objectives. The finding also is in line with Thomas (2013) who stated that school workshops accommodate instructional materials such as electronic sensors, equipment, machines and consumables materials for an achievable practical exercise in the workshop. These are instrumentalities needed to perform a service and required regular assessment and upgrading to meet up contemporary issues in mechanical craft practice trade towards achieving sustainable national productivity. The result of the study further found that there is no significant difference in the mean responses between Teachers and technical Instructors on the modern electronic gadgets expected in mechanical craft practice trade workshops for soaring sustainable national productivity in Rivers State. This signifies that modern machines and technologies easily aid teaching and learning in a technical college workshop. This available machine will serve as instructional materials that will improve competencies and encourage skills development among students in various occupations. As such, they will be useful and relevance in the world of work.

The finding further revealed competencies required of mechanical craft practice students to diagnosis and repair modern electronic gadgets in soaring sustainable national productivity in Rivers State. These findings include conduct fault diagnosis on electronic control system, conduct fault diagnosis on electronically braking system, check electronic diesel, conduct fault diagnosis on electronic sensors Control, conduct fault diagnosis on Distributorless Ignition System (DIS) among others are modern electronic gadgets expected in soaring sustainable national productivity in Rivers State. This finding agreed with the opinion of Olaitan and Ikeh (2015) which stated that competencies required to diagnosis modern machines in the technical college should involves ideas and knowledge that meet international standards to enhance competency, expertness and efficiency in term of acquiring practical knowledge needful and requires to operate machines in place of work. The finding also is in line with the view of Wilcox (2013) who stated that machines used in multinational oil industries and other place of work would help the students to easily adapt and mastery practical works at the various technical college workshops. The finding further revealed that there is no significant difference in the mean responses between teachers and technical instructors on the competencies required to diagnose modern electronic gadgets in soaring sustainable national productivity in Rivers State. This signifies that competencies acquired in mechanical craft practice trade basically required quality modern gadgets that help in fasting-up production process, providing training and other services to trainees in order to acquire practical knowledge and requisite skills.

## CONCLUSION

It is known fact that technology has made a step in revolutionizing the education process by adopting varieties of means to facilitate both teaching and learning in Technical Vocational Education and Training (TVET). These fast growing demand driven technologies will quickly help the mechanical craft practice to attain greater height and assist in building capacities in Nigeria economy for sustainable national productivity. It is a known fact, that technologies increase capacities every day and as such required competencies to tackle its fault on the various components for optimal productivity. These competencies are expected from graduates of mechanical craft practice to diagnosis and repair every fault identified which will be trained with these modern electronic gadgets in modern motor vehicles and acquired these skills and competencies involve. Improving mechanical craft practice facilities and teachers in the technical college will require competencies and skills to drive the process and rebranding the structures in the technological institution as it enhances soaring sustainable national productivity and growth in Rivers State.

### Recommendations

Based on the findings, the researchers recommend as follow:

1. That the government should provide modern electronic gadgets into mechanical craft practice section in technical college workshops for efficiency in practical training of the school.
2. That, the student of mechanical craft practice should be allowed to embark in industrial training in multinational oil industries to pave way for a universal learning in the institution and be familiar with modern electronic gadgets and tools in industry workshops.

### References

Alawa, V. A., Abraham, V.A. & Okeme, I. (2018). Competency improvement needs of teachers of agricultural in afforestation to effective teaching in Government owned secondary schools in Rivers State, Nigeria. *A journal of the Nigeria Vocational Association,* 2 (1), 13 – 17.

Araoye, M. I. (2016). Biology education and national productivity: Implication for transforming Nigerian educational system. *International journal of advanced academic research Art, Humanities, & Education*, 2 (7), 1 – 6.

Beako T. Y. (2018). Emerging technical skills expected of students of motor vehicle mechanic works for sustainable manpower development in Rivers State. *Unpublished Masters Thesis*' Department of Vocational and Technology Education, Rivers State University, Port Harcourt, Nigeria.

Beako, T.Y. (2018). Work skills needed of undergraduate students of motor vehicle mechanic to maintain clutch assembly in University Mechanical Workshops in Rivers State, Nigeria. *Journal of Annuals of Technology Education Practitioners Association of Nigeria. (ATEPAN),* (2), 149 – 157.

Kama, J. D. (2018). Perceived Entrepreneurial Skills required by the graduates of mechanical engineering craft practice of technical colleges in Nigeria. *Journal Annuals of Technology Education practitioners Association of Nigeria, (ATEPAN),* 1 (1), 35 – 43.

Marrian, W. (2018). Definition of Terms Retrieved from https://www.merrian – Webster. Com> soar. May 19, 2019

Mojekwu, O.E., Uka, C.S., Nwabueze, R.T., Agbai, J.C. & Ugwuegbulem, P.A. (2017). Innovative Entrepreneurship education and training as a veritable tool for sustainable economic recovery in Nigeria. *Proceedings of the 30th Annual National Conference of Nigerian Association of Teachers of Technology, Bauchi, Nigeria.* October 23 – 26.

National Board for Technical Education (NBTE) (2014) *Curriculum for Technical Colleges.* Kaduna: NBATE Press.

Obiajulu, L. O. (2018). Technical vocational education and training (TVET) as a tool for alternative energy sources and sustainable economic recovery in Nigeria. Proceedings of the 31st Annual National Conference of Technology Education Practitioners Association of Nigeria, Kano, October 15 - 18.

Olaitan, O. O. & Ikeh, J. O. (2015). Employability and technical skills required to establish a small scale automobile workshop. *Journal of Education & Practices*, 6(13), 120-131.

Okeke, M.L. & Eme, O. I. (2014). Challenges facing entrepreneurs in Nigeria. *Singaporean Journal of Business Economics and Management Studies*, 3 (5), 18 – 34.

Okereke, V. E., Bello, H. & Yakubu, A. (2018). Competency training needs of polytechnic pre-service technician for effective diagnosis and repairs of modern automobile in Bauchi State, Nigeria. *Proceeding of the 31st Annual National Conference of Technology Education Practitioners Association of Nigeria, Kano*. Nigeria. October 15 – 18.

Okwori, R. O, Bala, M.M. & Ogbu, I. J. (2011). Technology education and entrepreneurship for sustainable industrialization. *Proceeding of the 29th Annual National Conference of the Nigerian Association of Teachers of Technology (NATT), Minna, Nigeria.* October 17 – 20.

Oxford (2016). Oxford Dictionaries. Retrieved from https://en.oxforddictioanries.com soaring. May 3, 2019.

Paul, M .(2017). Causes of economic recession and effects. New York: Jossey Bass.

Thomas, R. (2013). How vehicle computers work, Retrieved from http:// www.howstuffworks.com. May 6, 2019.

Ryu, C. (2017). Educational significance of soft skills and hard skills. *Journal of Korean Practical Arts Education*, 23 (1), 1- 17.

Wordu, C.C. R., Isaac, U.C.N., Ogundu, I. & Ugoji, P.C. (2018). Policy and Legislation on TVET and alternation energy sources to sustainable economic recovery in Nigeria. *Proceeding of the 31st Annual National Conference of Technology Education Practitioners Association of Nigeria, Kano*. Nigeria. October 15 – 18.