



### Short Paper

# Competency Improvement Needs of Roadside Furniture Makers for the Production of Quality Products in Bauchi State, Nigeria

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## Abstract

The study determined the competency improvement needs of roadside furniture makers for the production of quality products in Bauchi State, Nigeria. Three research questions guided the study. The study adopted a descriptive survey research design. The study was conducted in Bauchi State, Nigeria. The population of the study consists of 210 roadside furniture makers in Bauchi State, Nigeria. A sample of 138 roadside furniture makers was selected using a multi-stage sampling technique. The instrument used to collect data for the study was a structured questionnaire titled "Competency Improvement Needs of Roadside Furniture Makers Questionnaire" (CINRFMQ) generated from a review of the literature. The instrument was validated by three experts in the field of woodwork technology education from the Department of Vocational and Technology Education, Abubakar Tafawa Balewa University Bauchi, and the School of Vocational and Technical Education, Abubakar Tafari Ali Polytechnic Bauchi. Cronbach's alpha method was used to determine the internal consistency of the questionnaire items. A reliability coefficient of 0.79 was obtained. The data collated was analyzed using the mean and Improvement Needed Index (INI) to answer the research questions. It was found out that roadside furniture makers in Bauchi State, Nigeria needed competency improvement in 6 competency items in basic design processes, 7 competency items in wood finishing, and 10 competency items in woodworking machines operations. Based on the findings of the study, it was concluded that the roadside furniture makers are lacking in 23 competencies and there is a need to improve these competencies otherwise they will continue to be deficient in the production of quality products. It was, therefore, recommended that the National Directorate of Employment (NDE) and Bauchi State Skills Acquisition Centres should organize improvement workshops for roadside furniture makers and the identified competencies should be utilized in the retraining of roadside furniture makers for the production of quality products.

*Keywords* – Competency improvement needs, Furniture, Furniture Makers, Quality Products, woodwork

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## INTRODUCTION

Wood is the hard fibrous substance consisting basically of xylem that makes up the greater part of the stems, branches, or roots of trees and other woody plants. Making things from wood is called woodwork. Woodwork is the act, art, or trade of working with wood. It is the process of building, making, or carving something using wood. Okwori, Adamu, and Odo (2013) described woodwork as the process of working with wood. According to Jibrin, Okwori, Hassan, and Jatau (2018) woodwork is referred to as an activity that involved skills for the production and servicing of wooden articles. Woodworking is one of the oldest occupations in the world, it comprises furniture making, carpentry, joinery, machine woodworking, and upholstery. Furniture making covers the manufacture of free-standing and built-in furniture and units, using wood as the sole or main material (Ezekiel, 2018). Free-standing furniture is

more commonly available as off-the-shelf items and can be moved from place to place if required. Free-standing furniture includes chests, beds, tables, chairs, and wardrobes. Built-in furniture is usually custom made for a particular situation and it is fixed into position, on a floor, against a wall, or framed in an opening. Modern kitchens are examples of built-in furniture (Jesberger, 2007).

A furniture maker is a person who makes or repairs items of furniture. Mamman, Ibrahim, and Kalla (2019) noted that many furniture makers are self-employed and sell unique and original pieces of furniture, others work for corporations and design templates that will be mass-produced and sold in high quantity. However, the researchers observed that, in Bauchi State, most of the furniture makers rent or acquire space where the manufacturing will be done close to busy roads so that whoever passes by can see their work, as such they are called roadside furniture makers. Mshelia (2015) posited that the production of quality products depends largely on the competency of the furniture makers in sketching a basic outline of what the final product will look like, with practical construction details, proportions, as well as decorative design. Moreover, Ezekiel (2018) stated that furniture makers require various competencies like the ability to select suitable materials and method of construction, which is determined by the characteristic of materials, machine skills, use of furniture (how, where to use the furniture). Preparation of materials, which involved cutting, planing, molding, grooving, laminating, and assembling such materials as wood, metals, plastics, glass, and rattan. Omole and Omole (2020) stressed that for one perform an occupational activity effectively, a certain level of competence is required.

The term competency refers to the capability to apply or use the set of related knowledge, skills, and abilities required or needed to successfully perform "critical work functions" or tasks in a defined work setting. According to Olaitan (2003), competency is the knowledge, skills and attitudes, and judgment that one is required to perform successfully in a specified proficiency program. Abdullahi (2010) viewed competency as the capability of accomplishing a job with a precision of certainty, practical knowledge in combination with ability, cleverness, and expertness. Okwori, *et al.*, (2013) stated that competencies often serve as the basis for skill standards that specify the level of knowledge, skills, and abilities required or needed in the workplace as well as potential measurement criteria for assessing competency attainment. Ugwuoke and Ifeanyieze in Ugwuoke and Osinem (2014) described competency as the ability to do something well, measured against a standard especially the ability acquired through experience or training. Oluchi and Pyiki (2019) explained competency as the ability to use a skill or set of skills by an individual to properly perform a specific job.

In the context of this study, competency is the knowledge, skills, and attitude required in the production of quality products by roadside furniture makers in Bauchi State, Nigeria. To produce quality products, roadside furniture makers require competencies in basic design processes, wood finishing, and woodworking machines operations. Basic design processes, in the view of Hallgrímsson (2012) is a comprehensive range of model making and prototyping methods being used to stimulate creativity and develop the functionality and appearance of a product before it goes into production. Finishing according to Michael (2015) is the process

of applying finishing materials (finishes) to wood surfaces either by polishing, spraying, or brushing for protection and preservation, decoration or beautification, and hygienic reasons. To make the body more attractive, decorative, and protected, the surface has to take place by a process called finishing with brush, spray, or roller. Choosing a particular finish is influenced by the furniture (Jibrin, *et al.*, 2018). The woodworking machine is very essential to woodworkers as it assists greatly in reducing human labor. Work that can be done manually in three days is usually done in a day using woodworking machines (Okwori, *et al.*, 2006). Woodworking machines are those machines used for processing wood into different forms or shapes. For instance, cutting, planing, molding, turning, grooving, rebating, and so on. These machines include jointer, thicknesser, spindle molder, band saw machine, and wood lathe among others (Okwori, Kareem, Abutu, Abu & Egbita, 2017).

These competencies are seen to be lacking by the roadside furniture makers in Bauchi State, Nigeria judging by the poor products produced by these furniture makers. Mshelia (2015) reported that most roadside furniture makers are deficient in furniture design and woodworking machines operations. Ezekiel (2018) stressed that the above situation is attributed to a lack of competency on the part of the roadside furniture makers. It is based on this deficiency that the researchers seek to determine the competency improvement needs of roadside furniture makers for the production of quality products in Bauchi State, Nigeria.

### **Objectives of the Study**

The main purpose of the study was to determine the competency improvement needs of roadside furniture makers for the production of quality products in Bauchi State, Nigeria. Specifically, the study identified:

1. The competencies improvement needed by roadside furniture makers in basic design processes for the production of quality products in Bauchi State, Nigeria
2. The competencies improvement needed by roadside furniture makers in wood finishing for the production of quality products in Bauchi State, Nigeria
3. The competencies improvement needed by roadside furniture makers in woodworking machines operations for the production of quality products in Bauchi State, Nigeria

### **Research Questions**

1. What are the competencies improvement needed by roadside furniture makers in basic design processes for the production of quality products in Bauchi State, Nigeria?
2. What are the competencies improvement needed by roadside furniture makers in wood finishing for the production of quality products in Bauchi State, Nigeria?
3. What are the competencies improvement needed by roadside furniture makers in woodworking machines operations for the production of quality products in Bauchi State, Nigeria?

## METHODS

The study adopted a descriptive survey research design. Descriptive survey research design uses questionnaires, interviews, and observations among others other to determine the opinions, attitudes, preferences, and perceptions of persons (Anyakaoha, 2009). The design was considered appropriate since the study used a questionnaire in other to determine the competency improvement needs of roadside furniture makers. The study was conducted in Bauchi State, Nigeria. The state is located in the North-East Geopolitical Zone of Nigeria. The population of the study consists of 210 roadside furniture makers in Bauchi State, Nigeria. A sample of 138 roadside furniture makers was selected using a multi-stage sampling technique. A stratified sample technique was employed to divide the state into three strata; Bauchi central senatorial zone, Bauchi North senatorial zone, and Bauchi South senatorial zone. According to Nwankwo and Emunemu (2015), the essence of stratification is to ensure that each group or component of the population is adequately represented in the research sample. Forty-six (46) respondents were purposely selected from each of the three senatorial zones. Creswell (2012) stated that in purposeful sampling, researchers intentionally select individuals and sites to learn or understand the central phenomenon.

The instrument used to collect data for the study was a structured questionnaire titled “Competency Improvement Needs of Roadside Furniture Makers Questionnaire” (CINRFMQ) generated from the review of the literature. The questionnaire was divided into two categories competencies required and competencies performed. The competencies required category had a 4-point response scale of highly required, averagely required, slightly required, not required with corresponding points of 4, 3, 2, and 1 respectively while the competencies performed had a 4-point response scale of high performance, average performance, low performance, no performance with corresponding points of 4, 3, 2 and 1 respectively. The instrument was validated by three experts in the field of woodwork technology education, two from the Department of Vocational and Technology Education, Abubakar Tafawa Balewa University Bauchi, and one from the School of Vocational and Technical Education Abubakar Tatar Ali Polytechnic Bauchi. Corrections were appropriately made before the administration of the questionnaire. Cronbach's alpha method was used to determine the internal consistency of the questionnaire items. A reliability coefficient of 0.79 was obtained.

The researchers with the help of three trained research assistants administered the instrument to the respondents; all the 108 copies of the questionnaires were retrieved. The data collected were analyzed using weighted mean and Improvement Needed Index (INI) adapted from Ukonze and Olaitan (2010); Omeh, Asogwa, and Omeje (2014); Ede and Ariyo (2015) to answer the research questions. The data improvement needed by the roadside furniture makers was determined as follows:

- (a) The weighted mean ( $\bar{X}_R$ ) of the required scale was determined by each item
- (b) The weighted mean ( $\bar{X}_P$ ) of the performance scale was determined by each item
- (c) The performance gap (PG) was determined by finding the difference between the values of  $\bar{X}_R$  and  $\bar{X}_P$ , that is  $\bar{X}_R - \bar{X}_P = PG$

Where PG is negative (-), it means improvement is not needed (INN) because the level at which the roadside furniture makers performed that item is greater than the level at which it was required. Where PG is positive (+), it means improvement is needed (IN) because the level at which the roadside furniture makers performed that item is lower than the level at which it was required. Where PG is zero (0), it means improvement is not needed (INN) because the level at which the roadside furniture makers performed that item is equal to the level at which it was required.

## **RESULTS**

The results of this study were obtained from the research questions answered using data collected and analyzed. The result in Table 1 revealed that competency items 1, 2, 3, 4, 5, and 6 had performance gap values ranging from 0.07 to 0.49 this showed that the roadside furniture makers need improvement in these competency items as they are performing below the required level. Competency items 7, 8, and 9 had performance gap values ranging from -0.01 to -0.06 this indicated that the roadside furniture makers do not need improvement in these competency items as they are already performing greater than the required level. While competency item 10 had a value of 0.00 this specified that roadside furniture makers do not need improvement in this competency item as they are already performing at the required level.

The result in Table 2 revealed that competency items 13, 14, 16, 17, 18, 20, and 21 had performance gap values ranging from 0.04 to 0.55 this indicated that the roadside furniture makers need improvement in these competency items as they are performing below the required level. Competency items 11 and 12 had performance gap values of -0.26 and -0.20 respectively this specified that the roadside furniture makers do not need improvement in these competency items as they are already performing greater than the required level. While competency items 15 and 19 had a value of 0.00 each this designated that roadside furniture makers do not need improvement in these competency items as they are already performing at the required level.

Table 1. Performance Gap Analysis of the Mean Rating on the Competencies Needed by Roadside Furniture Makers in Basic Design Processes for the Production of Quality Products in Bauchi State, Nigeria (N = 138)

S/N	Competency Items	$\bar{X}_R$	$\bar{X}_P$	PG ( $\bar{X}_R - \bar{X}_P$ )	Remarks
1.	Ability to translate abstract thoughts into rough sketches	3.28	3.10	0.18	IN
2.	Ability to transform the rough sketches into working drawings	3.16	2.91	0.25	IN
3.	Ability to sketch exploded views of the working drawings	3.20	2.50	0.07	IN
4.	Preparation of working rod to show all the requirements for the construction	3.30	2.81	0.49	IN
5.	Use of models/prototypes to express ideas in an accurate and precise manner	3.40	3.24	0.16	IN
6.	Review the areas of inadequacies in the design	3.37	3.21	0.16	IN
7.	Selection of suitable materials for the construction	3.35	3.36	-0.01	INN
8.	Prepare a cutting list from the nominal size finish sizes	3.40	3.46	-0.06	INN
9.	Preparation of materials	3.41	3.43	-0.02	INN
10.	Setting out (identification, mark on members, joints, marking out, etc.)	3.42	3.42	0.00	INN

N= Number of Respondents,  $\bar{X}_R$  = Mean of competencies required,  $\bar{X}_P$  = Mean of competencies performed, PG = Performance gap, IN = Improvement needed, INN = Improvement not needed

The result in Table 3 revealed that competency items 22, 24, 25, 27, 28, 30, 31, 33, 34, and 35 had performance gap values ranging from 0.01 to 1.11 this showed that the roadside furniture makers need improvement in these competency items as they are performing below the required level. Competency item 23 had a performance gap value of -0.02 this indicated that the roadside furniture makers do not need improvement in this competency item as they are already performing at greater than the required level. While competency items 26, 29, and 32 had values of 0.00 each this specified that roadside furniture makers do not need improvement in these competency items as they are already performing at the required level.

Table 2. Performance Gap Analysis of the Mean Rating on the Competencies Needed by Roadside Furniture Makers in Wood Finishing for the Production of Quality Products in Bauchi State, Nigeria (N = 138)

S/N	Competency Items	$\bar{X}_R$	$\bar{X}_P$	PG ( $\bar{X}_R - \bar{X}_P$ )	Remarks
11.	Remove excess glue around joints and on a flat surface of the furniture	3.00	3.26	-0.26	INN
12.	Remove oil and grease spots from the surface of the furniture	3.08	3.28	-0.20	INN
13.	Remove mill marks from the surface of the furniture	3.50	3.33	0.17	IN
14.	Check and correct defects from the surface of the furniture	3.05	2.89	0.16	IN
15.	Punch nails head below the surface of the furniture	3.33	3.33	0.00	INN
16.	Use of wood filler to fill nails holes, scratches, cracks, and any irregularities on the surface of the furniture	3.37	3.33	0.04	IN
17.	Sand the furniture using various grades of abrasives	3.15	3.12	0.03	IN
18.	Application of sanding sealer using brush/spraying machine to fill the porous holes.	3.50	2.95	0.55	IN
19.	Remove hardware before applying a wood finish	3.09	3.09	0.00	INN
20.	Select a suitable finish for the furniture	3.44	2.95	0.49	IN
21.	Correct use of pad/foam, brush, or spraying machine in applying the finishes	3.56	3.28	0.28	IN

N= Number of Respondents,  $\bar{X}_R$  = Mean of competencies required,  $\bar{X}_P$  = Mean of competencies performed, PG = Performance gap, IN = Improvement needed, INN = Improvement not needed



Table 3. Performance Gap Analysis of the Mean Rating on the Competencies Needed by Roadside Furniture Makers in Woodworking Machines Operation g for the Production of Quality Products in Bauchi State, Nigeria (N = 108)

S/N	Competency Items	$\bar{X}_R$	$\bar{X}_P$	PG ( $\bar{X}_R - \bar{X}_P$ )	Remarks
22.	Select the appropriate blade for the machine operation	3.31	3.00	0.31	IN
23.	Tighten the blade on the machine arbor	3.40	3.42	-0.02	INN
24.	Measure the required dimension between the blade and the fence	3.43	3.42	0.01	IN
25.	Set saw blade at an appropriate height above the table for the wood to be cut	3.04	3.00	0.04	IN
26.	Start the machine for the operation	3.38	3.38	0.00	INN
27.	Feed wood stock to the saw blade slowly to cut freely and clearly	3.64	3.44	0.20	IN
28.	Make correct use of a push stick to push a short narrow piece of wood into the machine	3.38	3.27	1.11	IN
29.	Switch off the machine and allow it to run off completely	3.20	3.20	0.00	INN
30.	Measure the required dimension to be planed	3.38	3.20	0.18	IN
31.	Set the depth of cut on the machine before operating	3.35	2.56	0.79	IN
32.	Switch on the machine to commence the operation	3.38	3.38	0.00	INN
33.	Place the workpiece flat on the in-feed table before commencing the operation	3.32	3.30	0.02	IN
34.	Make correct use of the fence	3.31	3.28	0.03	IN
35.	Switch off the machine and lock it off	3.35	3.34	0.01	IN

N= Number of Respondents,  $\bar{X}_R$  = Mean of competencies required,  $\bar{X}_P$  = Mean of competencies performed, PG = Performance gap, IN = Improvement needed, INN = Improvement not needed

## DISCUSSION

The findings of the study were discussed based on the answers to research questions. The result of research question 1 in Table 1 revealed that out of 10 items on competency improvement needed by roadside furniture makers in basic design processes, 6 items were found to be needed by roadside furniture makers for the production of quality products in Bauchi State, Nigeria. They are the ability to translate abstract thoughts into rough sketches, the ability to transform the rough sketches into working drawings, the ability to sketch

exploded views of the working drawings, the Preparation of a working rod to show all the requirements for the construction, Use of models/prototypes to express ideas in an accurate and precise manner, review the areas of inadequacies in the design. Therefore, as far as this finding is concerned the roadside furniture makers need improvement in basic design processes. This result was supported by the finding of Saidu (2021) who reported that many roadside furniture makers need retraining in basic design processes. This goes in consonance with Umar, Hamza, Olaosebikan, and Mannir (2018) conducted a study on metal forming needed by Artisan Welders in the production of standard doors and gates for households in Nigeria, reported that the ability to apply appropriate workshop processes, techniques and tools to mark out and form projects in sheet metals and plates was one of the findings needed in handling metal forming tools.

The result of research question 2 in Table 2 showed that out of 11 items on competency improvement needed by roadside furniture makers in wood finishing, 7 items were found to be needed by roadside furniture makers for the production of quality products in Bauchi State, Nigeria. They are the ability to remove mill marks from the surface of the furniture, check and correct defects from the surface of the furniture, use wood filler to fill nails holes, scratches, cracks, and any irregularities on the surface of the furniture, sand the furniture using various grades of abrasives, application of sanding sealer using brush/spraying machine to fill the porous holes, select the suitable finish for the furniture, correct use of pad/foam, brush or spraying machine in applying the finishes. This is related to the finding of Hassan, Dauda, and Badawi (2019) who discovered that woodwork teachers in Yobe State, Nigeria required skills for improving the finishing of practical projects in Technical Colleges in the State. Bakare and Fadaro in Jibrin, *et al.*, (2018) observed that when the required competencies are given to learners they will be competent to work efficiently with little no supervision. This implies that roadside furniture makers need competency improvement in wood finishing for the production of quality products in Bauchi State, Nigeria.

The result of research question 3 in Table 3 indicated that out of 14 items on competency improvement needed by the roadside furniture makers in woodworking machines operations 10 items were found to be needed by the roadside furniture makers for the production of quality products in Bauchi State, Nigeria. They are the ability to select the appropriate blade for the machine operation, measure the required dimension between the blade and the fence, set the saw blade at an appropriate height above the table for the wood to be cut, feed wood stock to the saw blade slowly to cut freely and, make correct use of push stick to push short narrow pieces of wood to the machine, measure the required dimension to be planed, set depth of cut on the machine before operating, place the workpiece flat on the in-feed table before commencing the operation, make correct use of the fence, switch off the machine and lock it off. This result conforms to the finding of Idi (2022) who found that many instructors need an upgrade in woodworking machines operations. This shows the roadside furniture makers need retraining in woodworking machines operations

## CONCLUSIONS AND RECOMMENDATIONS

This study was carried out to determine the competency improvement needs of roadside furniture makers for the production of quality products in Bauchi State, Nigeria. Based on the findings of the study, it is concluded that the roadside furniture makers are lacking in 23 competencies and there is a need to improve these competencies otherwise they will continue to be deficient in the production of quality products.

It was, therefore, recommended that the National Directorate of Employment (NDE) and Bauchi State Skills Acquisition Centres should organize improvement workshops for roadside furniture makers for the production of quality products. The directorate and skills acquisition centers should utilize the identified competencies in the retraining of roadside furniture makers for the production of quality products.

## IMPLICATIONS

The study revealed that there is a need for competencies improvement concerning basic design processes, wood finishing, and woodworking machines operations. The findings of the study will enable the National Directorate of Employment (NDE) and Bauchi State Skills Acquisition Centres to serve as advisory to the government on the need to improve the competencies possessed by roadside furniture makers for the production of quality products. It will also help the directorate and skills acquisition centers to identify the competencies that are deficient by roadside furniture makers and organize retraining for these furniture makers. This will also help the roadside furniture makers to be competent in the production of quality products in Bauchi State, Nigeria.

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