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Development and Standardization of an Instrument for Assessing Carpentry and Joinery Students' Practical Skills in Nigerian Senior Secondary Schools

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Abstract

The study aimed to develop and standardize an instrument for assessing carpentry and joinery students' practical skills for Nigerian Senior Secondary Schools (IACJSPS). Three research questions guided the study. The study employed an instrumentation research design and it was carried out in the North East, Nigeria. The population for the study was 267 respondents, comprising eight teachers and 259 SSS III students that are offering the carpentry and joinery trade. Five senior secondary schools were purposively selected from the basis of offering C&J trade subject; all the five carpentry and joinery teachers from the selected schools were used in the study, while a sample of 92 SSS III students was selected using a simple random sampling technique. The instruments used for data collection in the study were the Appropriate Competencies Questionnaire (ACQ) and the draft Instrument for Assessing Carpentry and Joinery Students' Practical Skills (IACJSPS). The instruments were validated by three experts and pilot tested at Saint Joseph College Vom, Plateau State. Based on the data obtained from the pilot test, the IACJTSPS was finally developed and tried out on the sampled carpentry and joinery trade students. The data obtained from the tried out was analyzed using Cronbach's Alpha and the reliability coefficient of the developed IACJSPS was found to be 0.88. The findings of the study were that: 90 competencies were considered appropriate for inclusion in the IACJTSPS. The developed IACJTSPS was found to be valid and reliable. It was therefore recommended that carpentry and joinery trade teachers of Nigerian senior secondary schools and examination bodies (NECO and WAEC) should adopt the IACJSPS as an instrument for assessing students' practical skills.

Keywords: Assessment Instrument, Carpentry and Joinery Trade, Practical Skills, Senior Secondary Schools

Introduction

The introduction of the carpentry and joinery trade in senior secondary schools in Nigeria aimed at achieving the national and global quest to reduce unemployment, poverty, and youth restiveness. The curriculum is designed to stimulate and enhance entrepreneurship in carpentry and joinery, prepare students for further studies in vocational

and technical education, engineering, architecture, estate management, building construction, among others, and meet the needs of students interested in making carpentry and joinery a second vacation or hobby. To achieve the foregoing objectives, the Federal Government of Nigeria (FGN, 2010) in the Senior Secondary School Curriculum for Carpentry and Joinery recommended demonstration with practice or hand-on methods of teaching and learning and worksite experience.

To check the understanding after teaching and learning activities, it is important that the teacher draft some questions in different ways to assess the knowledge and understanding of the topic. Accordingly, FGN (2010) stipulated that carpentry and joinery students' assessments should take cognizance of the psychomotor, cognitive, and affective domains and recommended practice tests, multiple-choice items, structured short-answer questions, and essays for assessment. The psychomotor domain is used to assess students' skills; the cognitive domain is used to assess students' knowledge, while the affective domain is used to assess students' attitudes. Assessment of students' skills entails the use of practical tests. The practical test may be either in the form of process assessment or product assessment. Process assessment involves the use of observation and grading of students in the entire task element or steps taken as they perform the given tasks in the form of a rating scale, while product assessment is done based on laid down criteria regarding the quality or characteristics of the finished product using a checklist (Olaitan, 2014).

The National Examinations Council (NECO) and the West African Examinations Council (WAEC) have been accorded the responsibility of assessing carpentry and joinery students' practical skills for the award of the Senior School Certificate (SSC) and West African Senior School Certificate (WASSC) respectively. However, the instrument used for assessing carpentry and joinery students' practical skills by NECO is not among the instruments that are trial-tested for determining its validity and reliability (NECO, 2016). Similarly, Myschool gist (2018) acknowledged that assessment in the carpentry and joinery trade is conducted as an alternative to practical in WAEC. Likewise, literature revealed that the current way of assessing practical skills in trade subjects, including carpentry and joinery, in Nigerian senior secondary schools is marred by the inability of most teachers to develop good assessment instruments (Ombugus, 2013; Olaitan, 2014; Okoye & Auta, 2020).

In deed a valid and reliable assessment may affects students' skills acquisition. If this happen, student's employability skills specifically the subjects matter skills of the carpenter and joinery students in Nigerian secondary schools could be affected in one way on the other; hence there might be skills deficit. Suarta, Suwintana, Sudhana, & Hariyanti, (2018) notes that misalliance in skill is an issue of concern to be address for students to cope with emergence demands in this 21st century workplace. This implies that areas affecting skills acquirement need to be duly identified and address by researchers, practitioners and industries to ensure that the curriculum remains up to date in term content,

input process for good products. Hence, resulting in high-performing graduates. This could be a reason why the Federal Government of Nigeria (2013) in its national policy on education highlighted that education is the best and obligatory tool for national development. Thus, measurement of students' skills acquisition is an issue of great concern particularly at the upper basic level of vocational technical education.

Furthermore, Moses, Medugu, Mohammed, and Wafudu (2017) noted that assessment of skills acquisition without valid and reliable criteria could be subjective and bound to injustice or deficiency of skills. On the other hand, Agu (2004), as cited in Ombugus (2013), opined that the current product assessment in practice at the upper basic vocational technical secondary school is ineffective in revealing the actual level of skills possessed by the students. Okoro (2008) lamented that product assessment has limitations; one of which is that students are bound to get external assistance when given a practical examinations task to be constructed in a product assessment method. This also implies that safety hazards management procedures and correct use of tools/equipment to be observed by a student cannot be assessed. More so, Time spent on constructing or repairing products or the number of mistakes made in the process are not considered. Thus, this author suggested that the best way to assess practical skills should be based on observed step-by-step performing tasks. It is based on this argument that this study proposed to fill the existing literature gap on inadequacy of use of assessment procedures of students' practical skills that emanated due to invalid, and none-reliable instrument for assessing carpentry and joinery students' practical skills for Nigerian Senior Secondary Schools.

Research Questions

The following research questions were answered to guide the conduct of this study:

1. What are the appropriate competencies for inclusion in the instrument for assessing carpentry and joinery students' practical skills for Nigerian Senior Secondary Schools?
2. What is the validity of the instrument for assessing carpentry and joinery students' practical skills for Nigerian Senior Secondary Schools?
3. What is the reliability of the instrument for assessing carpentry and joinery students' practical skills for Nigerian Senior Secondary Schools?

Methodology

Appropriate research methods were followed to ensure smooth conduct of this research paper based on available related literature. The research method deemed necessary were the research design, area of the study, population descriptions, sample and sample techniques, instrument for data collection, validation of the instrument, reliability of the instrument and methods of data collection and analysis. These were discussed and

presented as follows:

Research Design

The study employed instrumentation research design. According to Okoye and Auta (2020) instrumentation research design aimed at developing and authenticating the capability of an instrument for the purpose of a given behaviour. The design was used in this study because the study aimed to develop and standardize an instrument capable for assessing carpentry and joinery students' practical skills for Nigerian Senior Secondary Schools.

Area of the Study

The study was carried out in the North-East Zone, Nigeria. The zone is located within the geographical boundary of latitudes of 6,260 East and 4,920 North East of the equator. Its total land area is 103.639 m2 (Atlas, world map 2013, cited in Aminu & Apagu, 2016). The zone comprises: Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe States. However, there are eight (8) senior secondary schools in these six (6) States that all takes Senior Secondary Certificate Examinations (SSCE) in both NECO and WAEC where they write carpentry and joinery practical examinations yearly. Hence, this proposed instrument will be of huge important to them.

Population of the Study

The population for the study was 267 respondents; these comprised eight (8) carpentry and joinery teachers and two hundred and fifty-nine (259) SSS III students in the carpentry and joinery trade in the eight secondary schools that offer the carpentry and joinery trade in the study area. The teachers were used in the study to determine the appropriate competencies for inclusion in the IACJSPS and also served as assessors of the students during the try-out while the students were used for the try-out of the validated IACJSPS to establish its reliability. The choice of SSS III alone was based on the ground that they have received instruction for three years in the Senior Secondary Education Curriculum (SSEC) for the carpentry and joinery trade.

Sample and Sampling Techniques

A purposive sampling technique was used to select five senior secondary schools used in the study. Consequently, the choice of the five senior secondary schools was based on the adequacy of all the tools, equipment, and materials necessary for teaching and learning the carpentry and joinery trade (NECO, 2016). A total population sampling (TPS) was used to select all the five (5) carpentry and joinery trade teachers in the selected schools. According to Kothari (2004) TPS is one of the purposive sampling technique that involves examining the whole population if found small and manageable that has a

particular set of characteristics (e.g., specific attributes/traits, experience, knowledge, skills, exposure to an event, etc.). However, in this study since the number is relatively handy and it involves specific teachers of carpentry and joinery; therefore, the five number of teachers were justifiably used based on this argument earlier made.

On the other hand, simple random sampling technique was used to select 92 out of 259 students for the study. Simple random sampling technique refers to the most straightforward of all the probability sampling methods that involves random selection of subset of a population where each member has an equal chance to be partake in the study (Kothari, 2004). Thus, the simple random sampling technique was found suitable to select the 92 students that participated in this study because of the large size of the students from the diverse number of senior secondary school across the six (6) States in the study area. In addition, this number has supported the sample determination eared in the literature (Israel 2009; Asra, & Prasetyo 2015 and Susanti1a, Soemitro, Suprayitno, & Ratnasari, 2019) these authors corroborated conclusion on a minimum of 92 sample can be picked from a population of 259. Hence, the basis for 05 teachers and 92 students as sample of this study

Instruments for Data Collection

To determine the appropriate competencies for inclusion in IACJSPS, an Appropriate Competencies Questionnaire (ACQ) was developed by the researchers using a five-point rating scale of 5 = Highly Appropriate, 4 = Appropriate, 3 = Moderately Appropriate, 2 = Inappropriate and 1 = Highly Inappropriate and administered to teachers for rating. Based on the data obtained from the teachers' rating of each item in ACQ, a table of specifications based on the six levels of Simpson's (1972) model of the psychomotor domain and draft IACJTSPS on a five-point rating scale of 5 = Excellent, 4 = Very Good, 3 = Good, 2 = Fair and 1 = Poor were developed and subjected to content validation.

Validation of the Instrument

The validation was carried out by three subject experts; one expert in Woodwork Technology from the Department of Industrial and Technology Education, Federal University of Technology Minna; one expert in Curriculum from the Department of Educational Foundations, Bayero University Kano; and one expert in Testing and Measurement from the Department of Educational Foundations, Yusuf Maitama Sule University Kano. Okoro (2008) noted that establishing the content validity of an assessment instrument for assessing skills is very essential because it enables the examiner to determine the degree of coverage given by the assessment instrument to each item of the skills outlined in the curriculum. The experts recommended that the content of the draft IACJSPS was adequate and comprehensive for assessing carpentry and joinery students' practical skills for Nigerian Senior Secondary Schools.

Reliability of the Instrument

The validated draft IACJSPS was then pilot tested on SSS III carpentry and joinery trade students at Saint Joseph College Vom, Plateau State. The choice of the state was because the state is outside the study area and has common characteristics with the study area. Based on the data obtained from the pilot test, the final copy of the IACJSPS was developed and tried out on the sampled SSS III carpentry and joinery trade students.

Method for Data Analysis

The data obtained was computed using the Statistical Package of Social Sciences (SPSS) version 23. The data collected for research question one was analyzed using mean and standard deviation. Data for research question two was obtained using a table of specifications developed based on Simpson's (1972) model of the psychomotor domain. The data collected for research question three was analyzed using Cronbach's alpha formula. The mean scores were interpreted based on the true class limits of real whole numbers as follows: 4.50-5.00 = Highly Appropriate, 3.50-4.49 = Appropriate, 2.50-3.49 = Moderately Appropriate, 1.50-2.49 = Inappropriate, and 0.50-1.49 = Highly Inappropriate. Likewise, any competency with a reliability coefficient of 0.70 and above was considered acceptable as suggested by (Nunnally, 1978; DeVellis, 2012; Cho & Kim, 2015).

Results

Table 1 shows that 64 competencies have mean value ranges between 4.50 and 4.88. And 26 competencies have mean value ranges between 3.50 and 4.25. This implies that the respondents considered all the competencies appropriate for inclusion in the instrument for assessing carpentry and joinery students' practical skills for Nigerian Senior Secondary Schools.

Table 1: Mean rating and standard deviation of carpentry and joinery trade teachers on the appropriate competencies for inclusion in the IACJTSPS

S/N	Competencies N=5	Mean	δ	Remarks
Performance Objective 1: Construction of door and window frames				
1.	Interpretation of the drawing	4.25	.46	Appropriate
2.	Accuracy of dimensions	4.88	.35	Highly Appropriate
3.	Cutting of the head to the length	4.13	.35	Appropriate
4.	Cutting of jambs to length	4.63	.52	Highly Appropriate
5.	Cutting of sill to length	4.63	.52	Highly Appropriate
6.	Hand planing of parts	4.50	.53	Highly Appropriate
7.	Marking out Mortise and Tenon joints	4.50	.53	Highly Appropriate
8.	Cutting out Mortise and Tenon	4.50	.53	Highly Appropriate

9.	Assembling of parts	4.63	.52	Highly Appropriate
10.	Final appearance	4.63	.52	Highly Appropriate
Performance Objective 2: Frame construction of wall paneling, wall cladding, and partitioning				
11.	Interpretation of the drawing	4.25	.46	Appropriate
12.	Cutting studs and top plates to correct sizes	4.88	.35	Highly Appropriate
13.	Cutting window sill and header to correct sizes	4.13	.35	Appropriate
14.	Cutting cripples and sheaths to the correct sizes	4.63	.52	Highly Appropriate
15.	Hand planing of parts	4.63	.52	Highly Appropriate
16.	Marking out the housing joint	4.63	.52	Highly Appropriate
17.	Cutting out the housing joint	4.63	.52	Highly Appropriate
18.	Accuracy of dimensions	4.25	.46	Appropriate
19.	Assembling of parts	4.86	.35	Highly Appropriate
20.	Final appearance	4.13	.35	Appropriate
Performance Objective 3: Construction of pre-fabricated structures (wooden stairs, handrails, and balusters)				
21.	Interpretation of the drawing	4.63	.52	Highly Appropriate
22.	Setting out	4.63	.52	Highly Appropriate
23.	Preparation of strings and treads	4.25	.46	Appropriate
24.	Preparation of risers and newels	4.88	.35	Highly Appropriate
25.	Preparation of handrails	4.13	.35	Appropriate
26.	Accuracy of dimensions	4.50	.53	Highly Appropriate
27.	Assembling of stair members	4.50	.53	Highly Appropriate
28.	Fixing of the bottom step	4.50	.53	Highly Appropriate
29.	Fixing of balustrades	4.63	.52	Highly Appropriate
30.	Final appearance	4.63	.52	Highly Appropriate
Performance Objective 4: Construction of wooden scaffold				
31.	Interpretation of the drawing	4.25	.46	Appropriate
32.	Cutting legs to length	4.88	.35	Highly Appropriate
33.	Cutting the stretcher to length	4.13	.35	Appropriate
34.	Marking up the stretchers and drilling through them	4.63	.52	Highly Appropriate
35.	Cutting the rung sockets	4.63	.52	Highly Appropriate
36.	Fixing the stretcher and cross bracing	4.25	.46	Appropriate
37.	Building the platform	4.88	.35	Highly Appropriate
38.	Accuracy of dimensions	4.13	.35	Appropriate
39.	Assembling of parts	4.63	.52	Highly Appropriate
40.	Final appearance	4.63	.52	Highly Appropriate
Performance Objective 5: Construction of wooden ladder				
41.	Interpretation of the drawing	4.25	.46	Appropriate

42.	Cutting parts to length	4.88	.35	Highly Appropriate
43.	Hand planing of parts	4.13	.35	Appropriate
44.	Marking out the Tenon	4.63	.52	Highly Appropriate
45.	Cutting out Tenon	4.63	.52	Highly Appropriate
46.	Marking out the mortise	4.50	.53	Highly Appropriate
47.	Cutting out mortise	4.50	.53	Highly Appropriate
48.	Accuracy of dimensions	4.50	.53	Highly Appropriate
49.	Assembling of parts	4.63	.52	Highly Appropriate
50.	Final appearance	4.63	.52	Highly Appropriate
Performance Objective 6: Construction of roof, ceiling frames, and covering				
51.	Interpretation of the drawing	4.25	.46	Appropriate
52.	Cutting of parts to correct sizes	4.88	.35	Highly Appropriate
53.	Fixing of gable ends	4.13	.35	Appropriate
54.	Fixing of intermediate trusses	4.63	.52	Highly Appropriate
55.	Laying and fixing purlins	4.63	.52	Highly Appropriate
56.	Laying and fixing ridge joists	4.63	.52	Highly Appropriate
57.	Fixing of barge boards	4.63	.52	Highly Appropriate
58.	Fixing of roofing sheets	4.25	.46	Appropriate
59.	Accuracy of dimensions	4.88	.35	Highly Appropriate
60.	Final appearance	4.13	.35	Appropriate
Performance Objective 7: Construction of pre-cast lintel formwork				
61.	Interpretation of the drawing	3.50	.54	Appropriate
62.	Accuracy of dimensions	3.63	.52	Appropriate
63.	Cutting of the bottom to size (Soffit piece)	3.75	.71	Appropriate
64.	Cutting of sides to length	4.63	.52	Highly Appropriate
65.	Cutting of braces to length	4.63	.52	Highly Appropriate
66.	Marking out the size of the lintel on the sides	4.50	.53	Highly Appropriate
67.	Fixing of braces	4.50	.53	Highly Appropriate
68.	Treatment of internal parts with a release agent	4.50	.53	Highly Appropriate
69.	Assembling of parts	4.63	.52	Highly Appropriate
70.	Final appearance	4.63	.52	Highly Appropriate
Performance Objective 8: Construction of the flat segmental arch				
71.	Interpretation of the drawing	4.25	.46	Appropriate
72.	Cutting of laggings to length	4.88	.35	Highly Appropriate
73.	Cutting of ribs to length	4.13	.35	Appropriate
74.	Cutting of plates to length	4.63	.52	Highly Appropriate
75.	Marking out curves shaves on the ribs	4.63	.52	Highly Appropriate
76.	Cutting out curves shaves on the ribs	4.25	.46	Highly Appropriate
77.	Marking out the position of the laggings on the ribs	4.88	.36	Highly Appropriate

78.	Accuracy of dimensions	4.13	.35	Appropriate
79.	Assembling of parts	4.63	.52	Highly Appropriate
80.	Final appearance	4.63	.52	Highly Appropriate
Performance Objective 9: Construction and finishing of a table, chair, and stool				
81.	Interpretation of the drawing	4.25	.46	Appropriate
82.	Accuracy of dimensions	4.88	.35	Highly Appropriate
83.	Cutting of parts to the correct sizes	4.13	.35	Appropriate
84.	Hand planning of parts	4.63	.52	Highly Appropriate
85.	Marking and cutting mortise and Tenon	4.63	.52	Highly Appropriate
86.	Assembling of parts (using glue or nails)	4.50	.53	Highly Appropriate
87.	Preparing the surfaces for finishing	4.50	.53	Highly Appropriate
88.	Preparing the finish	4.50	.53	Highly Appropriate
89.	Applying the finish with a brush	4.63	.52	Highly Appropriate
90.	Final appearance	4.63	.52	Highly Appropriate

Source: Field study (2019)

Table 2 indicates that out of 521 practical skills, 7% comprising 38 practical skills were to assess the Perception level; 7% comprising 38 practical skills were to assess the Set level; 25% comprising 128 practical skills were to assess the Guided response level; 25% comprising 128 practical skills were to assess the Mechanism level; 29% comprising 151 practical skills were to assess the Complex overt responses level and 7% comprising 38 process skills were to assess the Adaptation level. The Origination level of Simpson's Model was not involved in the study because it was not involved in the SSEC. These results showed that six levels of the domain were adequately covered in the assessment instrument. This indicates that all the 521 practical skills were valid for inclusion in the assessment instrument.

Table 2: Distribution of process skills across the six levels of simpson's psychomotor domain

S/N	Simpson's Psychomotor Domain Levels	Number of Practical Skills	% Obtained	% Recommended by Simpson's
1.	Perception	38	7%	5-10%
2.	Set	38	7%	5-10%
3.	Guided response	128	25%	20-30%
4.	Mechanism	128	25%	20-30%
5.	Complex overt re-sponses	151	29%	25-30%
6.	Adaptation	38	7%	5-10%
	Total Practical Skills	521		

Source: Field survey (2019)

Table 3 revealed that the reliability coefficient of all the competencies was found to be between the ranges of 0.86 and 0.88, whereas that of the entire instrument was obtained at 0.87, which indicates good internal consistency of the competencies.

Table 3: Summary of reliability coefficient (Cronbach Alpha) of the instrument (IACJSPS)

S/N	Performance Objectives	Alpha	No. of Competencies	Remarks
1.	Construction of door and window frames	0.87	10	Good
2.	Frame construction of wall paneling, wall cladding, and partitioning	0.86	10	Good
3.	Construction of pre-fabricated structure (wooden stair, handrails, and balusters)	0.88	10	Good
4.	Construction of wooden scaffold	0.87	10	Good
5.	Construction of wooden ladder	0.87	10	Good
6.	Construction of roof, ceiling frames, and covering	0.88	10	Good
7.	Construction of pre-cast lintel formwork	0.87	10	Good
8.	Construction of the flat segmental arch	0.87	10	Good
9.	Construction and finishing of a table, chair, and stool	0.86	10	Good
		0.87	90	Good

Source: Field survey (2019)

Findings of the Study

1. Ninety (90) competencies derived were considered appropriate for inclusion in the instrument for assessing carpentry and joinery students' practical skills for Nigerian Senior Secondary Schools.
2. The instrument for assessing carpentry and joinery students' practical skills for Nigerian Senior Secondary Schools (IACJTSPS) was found to be valid.
3. The instrument for assessing carpentry and joinery students' practical skills for Nigerian Senior Secondary Schools (IACJTSPS) was found to be reliable.

Discussions of the Findings

The finding showed that all the 90 competencies derived were considered appropriate for inclusion in IACJSPS. In a similar study conducted by Ibrahim (2012), all

the 23 competencies/skills derived were found appropriate for inclusion in the instrument for assessing students' manipulative skills in bricklaying and block laying practice. Likewise, Okwelle and Okoye (2012) found that all the 76 practical skills they developed were considered appropriate for inclusion in an instrument for assessing practical skills in fault diagnoses and repairs of radio and television systems. Mohammed (2016) in a study to develop and validate an instrument for assessing technical college students' practical skills in carpentry and joinery, all the 123 generated were retained. To this end, all 90 competencies were included in the IACJTSPS.

The finding also revealed that the IACJSPS was found to be valid. The validation was carried out using content validation. In similar studies, Ombugus (2013) ascertained the validity of WBPST by constructing a table of specifications based on the six levels of the psychomotor domain of Simpson (1972). Thereafter, teachers and technicians of mechanical engineering and experts in the industrial technical section of vocational teacher education and measurement and evaluation, from the University of Nigeria Nsukka, were given the instrument to indicate how important the items are for assessing students' skills performance. Additionally, Adamu et al. (2015) established the content validity of METSAI by identifying a major practical area for assessment from the NBTE curriculum, isolation of tasks, and performance objectives relating to the major practical skill areas. The objectives were transformed into 13 basic task statements. A table of specifications was developed based on the seven levels of the psychomotor domain of Simpson (1972), which spread into behaviours or skills to be observed. The METSAI was submitted to four experts for content validation. The experts were made up of two lecturers from the Department of Technology Education, the Modibbo Adama University of Technology Yola, and two lecturers from the Department of Vocational and Technology Education, Abubakar Tafawa Balewa University Bauchi. Their observations, corrections, and suggestions were used to improve the quality of the instrument. The findings of the above authors gave credibility to the findings of this study.

The finding also revealed that the IACJSPS was reliable. Inconsistent with this finding, Ombugus (2013) found the reliability coefficient of WBPST between 0.71 and 0.83 with an overall coefficient of 79. Olaitan (2014) found the internal consistency reliability coefficient of the process skill rating scale test between 0.84 and 0.96. Also, Adamu et al. (2015) found that the scheme for assessing technical teachers' competencies in constructing assessment instruments (SATCCAI) possesses a high-reliability coefficient of 0.82. To this end, IACJSPS was considered reliable and could be used for assessing carpentry and joinery students' practical skills for Nigerian Senior Secondary Schools.

Conclusion

The findings of this study have resulted in a developed and standardized instrument for assessing carpentry and joinery students' practical skills for Nigerian Senior Secondary

Schools (IACJSPS) that contains 90 competencies with a 5-point rating scale of Excellent, Very Good, Good, Fair, and Poor. The instrument (IACJSPS) has a reliability coefficient of 0.88. This shows that the instrument (IACJSPS) is proficient in effectively assessing carpentry and joinery students' practical skills for Nigerian Senior Secondary Schools.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Carpentry and joinery trade teachers should adopt and use the IACJSPS in assessing carpentry and joinery students' practical skills for Nigerian Senior Secondary Schools.
2. The statutory public examination bodies (NECO and WAEC) should adopt the IACJSPS as an instrument for assessing carpentry and joinery students' practical skills for Nigerian Senior Secondary Schools.
3. The Nigerian Educational Research and Development Council should adopt and use the IACJSPS in the evaluation of the carpentry and joinery trade curriculum in the country.

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