Assessing the Management, Maintenance and Adequacy of Resources for Efficiency of Woodwork Workshops among Colleges of Education (Technical) in Nigeria

by
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Abstract
The study explored the management, maintenance and adequacy of resources for the efficiency of woodwork workshop among Colleges of Education (Technical) in Nigeria. Specifically, it examined the management practices of woodwork workshop, determined the level of its maintenance and assessed the adequacy of resources in the woodwork workshop. Dual-stage sampling procedure was used to select 208 respondents for the study. Through a mixed-method approach involving surveys, interviews, and observational studies, a validated interview schedule was used to collect primary data from selected Technical Colleges across Nigeria, which were summarized with percentages means and standard deviation while correlation analysis was used to draw inferences. Results showed that the mean age of the respondents was 42±5 years, mean years of experience in woodwork workshop 12±3 and mean years of formal education was 16±2. Also, it was revealed from the survey that 76.9percent of the respondents indicated that woodwork workshops were poorly managed; more than half (59.1%) indicated fair maintenance level of the woodwork workshop and about two-third (64.9%) specified that woodwork resources were not adequate respectively. Further results showed that management ($r = 0.211$; $p \leq 0.01$) had a positive and significant relationship with efficiency of woodwork workshop. It was concluded from the study that woodwork workshop was moderately efficient. Therefore, improving funding policies, incorporating modern management practices, and prioritizing maintenance training to optimize workshop productivity and sustain the quality of technical education is imperative for efficient woodwork workshop.
Keywords: Management, maintenance, adequacy, efficiency, woodwork, workshops

Introduction

The role of technical and vocational education in Nigeria has long been recognized as crucial to the nation's socio-economic growth (Ogunode, Adeniyi & Ukozor, 2024). Woodwork workshops in Colleges of Education (Technical) are vital within this framework, aiming to produce graduates who are self-reliant, technically skilled, and able to contribute to local industries. Technical education, particularly woodwork technology, is seen as a key driver of development as it equips students with practical skills for sectors like construction, carpentry, and furniture making, which have substantial employment potential in both urban and rural areas (Okolie, 2017; Shuaibu et al., 2019). Historically, Nigeria's technical institutions were established with the goal of reducing youth unemployment and addressing skill shortages in various trades. Over time, however, a number of systemic issues have impacted the effective delivery of these programmes. Challenges such as inadequate funding, outdated equipment, and poor maintenance practices have undermined the ability of these workshops to produce work-ready graduates. For example, equipment in woodwork workshops is often old and poorly maintained due to limited financial support for repairs or replacements. As a result, students often lack access to hands-on training with the modern tools and technologies that are prevalent in the industry (Akounjom, Babatunde, & Aiguobarueghian, 2024; Chinonso, 2017). Moreover, effective workshop management requires not only functional equipment but also qualified instructors with current industry

knowledge. In many Nigerian Colleges of Education (Technical), instructors face a lack of opportunities for professional development and are often not adequately trained in modern woodwork techniques Chinonso, Nwonu, Uchechukwu, & Agu, 2019). This training gap has a direct impact on students, as instructors may be unable to teach industry-relevant skills or ensure safety in the workshop, which limits the students' ability to succeed in the competitive job market. Thus, the gap between industry demands and student competencies continues to widen, affecting graduates' employability and productivity. In addition to management and instructional challenges, consumption trends and resource utilization are significant issues in these workshops. High costs and limited access to quality wood and other essential materials mean that many institutions are forced to limit practical training sessions. As a result, students may receive minimal hands-on practice, reducing their proficiency in critical skills required for woodwork trades. Furthermore, with growing awareness of environmental conservation, there is a call for more sustainable practices within woodwork workshops. While sustainable alternatives could reduce material costs and environmental impact, many institutions have yet to adopt such practices due to budgetary and logistical limitations (Shuaibu et al., 2019).

The Nigerian government has, in recent years, acknowledged the importance of technical education for economic growth. However, funding and policy initiatives to support technical colleges have been sporadic and often insufficient (Adewale, 2022). The situation calls for a collaborative approach, involving government, private sector stakeholders, and educational institutions, to address the barriers limiting the effectiveness of woodwork workshops. Improving the functionality and relevance of these workshops can lead to better-prepared graduates, more self-reliant individuals, and an overall boost in Nigeria's skilled labor force (Okolie, 2017). In essence, this study highlights the need for a strategic overhaul of management, maintenance, and resource practices in woodwork workshops across Nigerian Colleges of Education (Technical). Addressing these challenges will require comprehensive reforms that ensure students gain practical skills that align with current industry standards. This, in turn, would contribute to job creation, reduce unemployment, and support broader socio-economic objectives in Nigeria. The integration of management, maintenance, productivity, and resource consumption in woodwork workshops within Nigerian technical colleges is an essential foundation for sustainable development in education and the labor market. Effective management of woodwork workshops ensures that tools, materials, and human resources are utilized optimally, creating an efficient learning environment where students can gain the skills needed in today's dynamic job market (Adeniran & Omoniyi, 2024).). This practical, hands-on training is critical for students in technical colleges, as it enables them to develop core competencies required in fields such as furniture-making, carpentry, and design, directly contributing to economic growth and self-employment opportunities (Okolie, 2017). Nigeria's Colleges of Education (Technical) play a key role in the nation's educational and industrial landscape. However, the workshops at these institutions often lack updated curricula, modern equipment, and well-trained instructors. For instance, many of these institutions still rely on outdated and, in some cases, non-functional equipment due to poor maintenance practices and insufficient funding for repairs and upgrades (Chinonso, 2017). This issue limits the extent to which students can acquire advanced technical skills and, ultimately, restricts their competitiveness in the job market upon graduation (Peter et al., 2010).

An effective management strategy in woodwork workshops involves more than just overseeing day-to-day operations; it requires planning for regular updates to equipment, a well-structured resource allocation system, and continuous training for instructors to stay abreast of current industry practices (Idowu, 2023). A properly managed workshop not only enhances productivity but also prevents the premature breakdown of machines and wastage of resources. In other contexts, technical institutions have adopted preventive maintenance practices, an approach that involves regular inspections and repairs rather than waiting for equipment failure. Such practices help extend the life of machinery, thereby optimizing costs and improving the reliability of workshop resources for students' training (Shuaibu et al., 2019). Moreover, recent trends in the global education sector emphasize sustainable consumption practices, especially in industries like woodworking that rely heavily on raw materials such as timber. Sustainable practices in woodwork technology education involve incorporating resource conservation techniques, using alternative materials, and minimizing waste wherever possible. In Nigeria, adopting these practices could help reduce the financial burden on colleges, making it easier to maintain an adequate supply of materials for practical sessions (Tam & Trzmiel, 2018). These measures not only support the financial sustainability of technical colleges but also align with global environmental conservation efforts, positioning students as future industry professionals equipped with both technical and ecological awareness. In sum, a comprehensive approach to managing woodwork workshops—one that prioritizes effective maintenance, resource optimization, and sustainable practices—can significantly elevate the quality of technical education in Nigeria. Through increased government support and private sector involvement, colleges can acquire necessary resources and update their facilities, fostering an environment conducive to skill acquisition and preparing students to meet the demands of a competitive job market (Ofor-Douglas, 2023). This strategic approach can ultimately improve productivity within these workshops, enhancing the employability and self-reliance of graduates, and contributing to broader socio-economic development (Musa & Gasamu, 2024). Entrepreneurship: Skill and Self-Reliance among Polytechnics' Students in Nigeria (A Case Study of North-Eastern Nigeria).).

In recent years, there has been growing concern over the effectiveness of woodwork workshops in Colleges of Education (Technical) across Nigeria. These workshops are crucial to the development of practical skills among students, who are expected to graduate with the technical competencies necessary for employment or self-employment in the woodwork and furniture-making industries. However, multiple factors hinder the effectiveness of these workshops, including inadequate management practices, insufficient maintenance, limited resources, and outdated equipment. These problems severely compromise the quality of training students receive, affecting their skill acquisition, practical experience, and overall readiness for the job market (Okolie, 2017; Shuaibu et al., 2019). A major challenge is the issue of resource scarcity. Most woodwork workshops in these colleges suffer from limited funding, leading to the frequent shortage of essential materials and tools needed for practical sessions. This shortage often results in students either working with substandard tools or spending minimal time on hands-on tasks, thereby restricting their ability to develop proficiency in woodwork practices. Without regular access to high-quality, industrystandard equipment, students cannot fully develop the skills required to meet industry expectations, which diminishes their employability after graduation (Chinonso,

2017). Additionally, maintenance practices within these workshops are typically inadequate. Many institutions rely on corrective maintenance, addressing issues only when equipment fails rather than implementing preventive maintenance routines. This reactive approach often leads to prolonged equipment downtime and a reduction in the lifespan of tools and machinery.

Consequently, students face interruptions in their training and often work with faulty or limited resources, which not only impedes their learning but also increases the risk of accidents (Eli-Chukwu, Igbokwe, Ifebude, Nmadu, Iguodala, Uma, & Akudo, 2023). Another aspect of the problem is the limited professional development and training opportunities available to workshop instructors. Many instructors lack exposure to modern woodworking techniques and the latest industry standards, as funding and opportunities for professional growth are minimal. As a result, they may be unable to effectively guide students in acquiring contemporary skills that match market demands. This gap in instructor knowledge and skills is directly transferred to students, who graduate underprepared and face difficulties in adapting to modern woodwork practices (Okolie, 2017; Shuaibu et al., 2019). Furthermore, ineffective management practices hinder the operational efficiency of these workshops. Challenges in resource allocation, inventory control, and safety enforcement are common. Many colleges do not have structured management systems for overseeing the distribution and monitoring of resources, leading to wastage, misuse, and even theft. Inadequate safety protocols further compromise the learning environment, increasing the risk of accidents and creating a setting that does not prioritize student well-being (Chinonso, 2017). Despite Nigeria's national policy emphasizing technical and vocational education as a pathway to economic growth and self-reliance, these persistent issues continue to undermine the role of woodwork workshops in Colleges of Education (Technical). Unless addressed, these problems will persistently hinder the development of skilled woodwork professionals, thereby limiting the potential contribution of technical graduates to Nigeria's economy and further exacerbating unemployment and underemployment rates among youth (Olubusoye, Salisu & Olofin, 2023). This study, therefore, seeks to investigate the management, maintenance, productivity, and consumption trends within these workshops to provide actionable insights and recommendations for improvement.

Methodology

The study was conducted in the Northern and Southern part of Nigeria. The northern part of Nigeria is the largest region in the country, covering more than 70% of its landmass. It is home to a variety of ethnicities and religions, and is a major agricultural region. The region is predominantly Muslim, with the Hausa, Fulani, and Kanuri people being the most prominent in the north-western and eastern parts. The Yoruba, Nupe, Tiv, Igala, and Idoma are the most prominent in the north central (Kaba, 2024). There are also large Christian populations in the north, especially in the north central. The north has a varying seasonal climate, with high temperatures in the hot months and frosts at night. The region receives less than 20 inches of rain per year. The southern part of Nigeria is made up of several regions, including the Niger Delta and the SouthSouth zone. A geopolitical region that includes the states of Akwa Ibom, Bayelsa, Cross River, Delta, Edo, and Rivers (Irogbo, Itoje-Akpokiniovo, Edo, Akpoghelie and Lawal, 2023). The South-South zone is known for its long rainy season, with some areas receiving rainfall year-round. Dual-stage sampling procedure was used to select respondents for the study. At the first

stage, there was a purposive selection of four (4) government Colleges of education (Technical) based on the availability of woodwork workshop from each of the Northern and Southern Nigeria resulting to eight (8) Colleges of education. At the second stage, 10 instructors, 10 workshop managers and 6 students were randomly selected resulting to 26 respondents in each of the colleges. At the final stage, 26 respondents were randomly chosen from each of the selected colleges of education making a total number of 208 sample size for the study. A validated interview schedule was used to collect quantitative data which were summarised with percentages, means and standard deviation while Pearson Product moment Correlation (PPMC) was used to draw inference.

Results and Discussion

Demographic Characteristics of the Respondents

Results in Figure 1 revealed that more than half of the respondents (52.9%) were aged between 30-50 years, 25.0percent indicated above 50years while 22.1percent also specified that they were less than 30 years of age. The mean age in years of the respondents was 42±5. This could be deduced that more than half of the respondents were still in their active age of work.

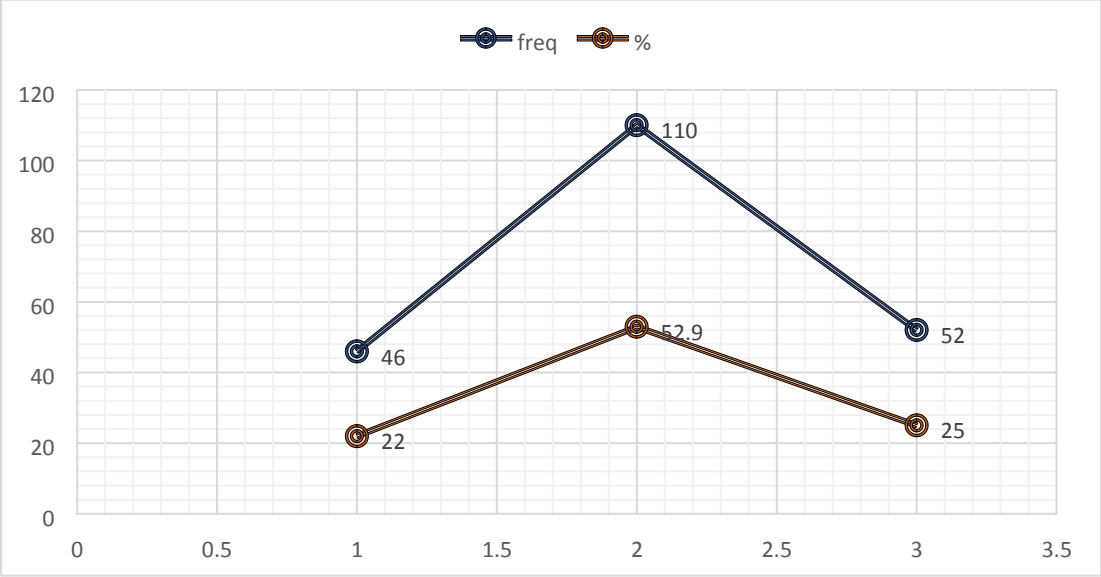

Figure 1: Distribution of respondents based on their age
Mean Score = 42±5 years **Source**:
Field Survey, 2024.

Years of woodwork experience

Results in Figure 2 showed that 9.1percent of the respondents had between 1-5years as their years of working experience, 10.6percent indicated 6-10 years, 43.8percent specified 11-15 years, 21.2percent indicated 16-20 years and 15.3percent indicated above 20 years of work experience. The mean years of work experience of the respondents was 12±3. This implies that years of work experience of the majority of the respondents were above a decade.

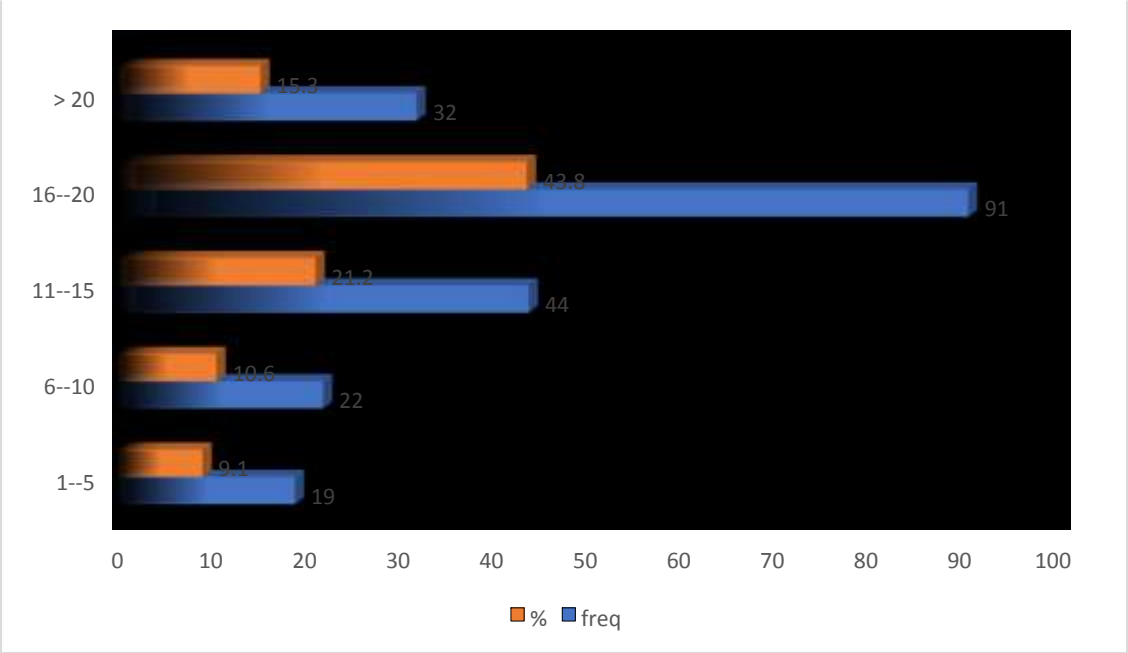

Figure 2: Distribution of respondents based on their years of work experience
Mean Score = 12±3 years **Source**:
Field Survey, 2024.

Years of formal education

Results in Figure 3 showed that very few (3.4%) of the respondents had formal education less than 6 years, 14.4percent indicated 6-12 years, about two-third (61.5%) indicated 13-16 years and 20.7percent specified above 16 years as their own years of formal education. The mean years of formal education was 16±2. This implies that majority of the respondents had tertiary education, thus, they were educated.

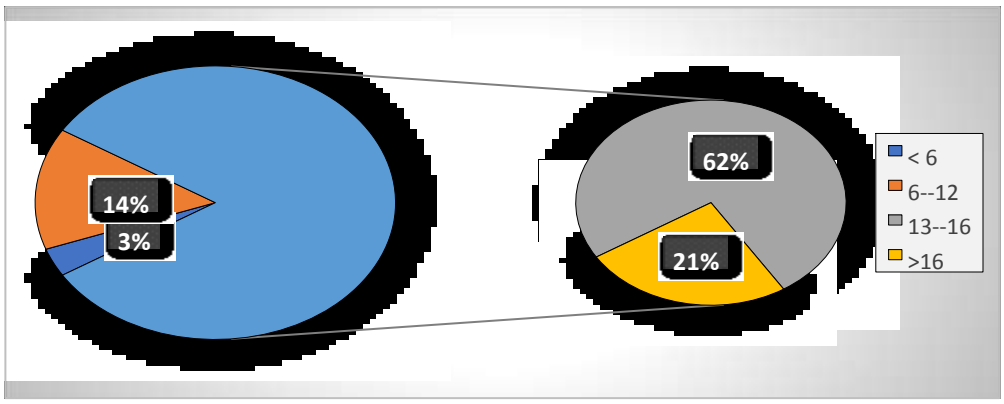

Figure 3: Distribution of respondents based on their years of formal education
Mean Score = 16±2 years **Source**:
Field Survey, 2024.

Management Practices of Wood Workshop

In the management of woodwork workshop in enhancing efficiency, Results in Table 1 show

that the respondents indicated indifference ($\bar{x}$=2.56) in safety of staff and student given priority at the woodwork workshop. The respondents disagreed to the following statements that: there is consideration of expertise in staff to be employed at woodwork workshop ($\bar{x}$= 2.36), productivity assessments are regularly conducted in the workshop ($\bar{x}$=2.12), waste management practices in the wood work workshop are effective ($\bar{x}$=2.05), regular meetings are held to discuss workshop needs ($\bar{x}$=1.89), the student-to-instructor ratio in the workshop is appropriate for effective learning ($\bar{x}$=1.79), the availability of materials significantly affects the productivity of the workshop ($\bar{x}$=1.77) and high effectiveness in the management of woodwork workshop in my college ($\bar{x}$=1.66). This implies that at the management level, safety of staff and student was prioritized in the study areas. However, the grand mean score for the management variables was $\bar{x}$=2.02. This implies that the management of the selected colleges of education needs to prioritize what will enhance functionality of the woodwork workshop.

Table 1: Management practices of woodwork workshop

Management variables	SA Freq	A Freq	U Freq	D Freq	SD Freq	Ranked mean
	-	4(1.9)	30(14.4)	53(25.5)		
Safety of staff and student are given priority at the woodwork workshop					71(34.1)	2.56
There is consideration of expertise in staff to be employed at woodwork workshop	21(10.1)	24(11.5)	53(25.5)	21(10.1)	89(42.8)	2.36
Productivity assessments are regularly conducted in the workshop	13(6.3)	11(5.3)	38(18.3)	71(34.1)	75(36.1)	2.12
Waste management practices in the wood work workshop are effective	-	40(19.2)	-	98(47.1)	70(33.7)	2.05
Regular meetings are held to discuss workshop needs	-	12(5.8)	62(29.8)	25(12.0)	109(52.4)	1.89
The student-to-instructor ratio in the workshop is appropriate for effective learning	-	28(13.5)	33(15.9)	14(6.7)	133(63.9)	1.79
The availability of materials significantly affects the productivity of the workshop	-	10(4.8)	30(14.4)	70(33.7)	98(47.1)	1.77
High effectiveness in the management of woodwork workshop in my college	14(6.7)	7(3.4)	12(5.8)	36(17.3)	139(66.8)	1.66

Grand $\bar{x}$ score= 2.02 **Source**: Field Survey, 2024.

Level of management of Wood Workshop

Results from Figure 4 show the overall level of how woodwork workshops in the study areas are been managed. According to the respondents, majority (76.9%) stipulated that woodwork workshops were poorly managed,19.3percent indicated that woodwork workshops were fairly managed while very few (3.8%) specified that woodwork workshops were well managed. It could be inferred from the findings that woodwork workshops were poorly managed and this would unturn affect its efficiency and functionality in the study areas.

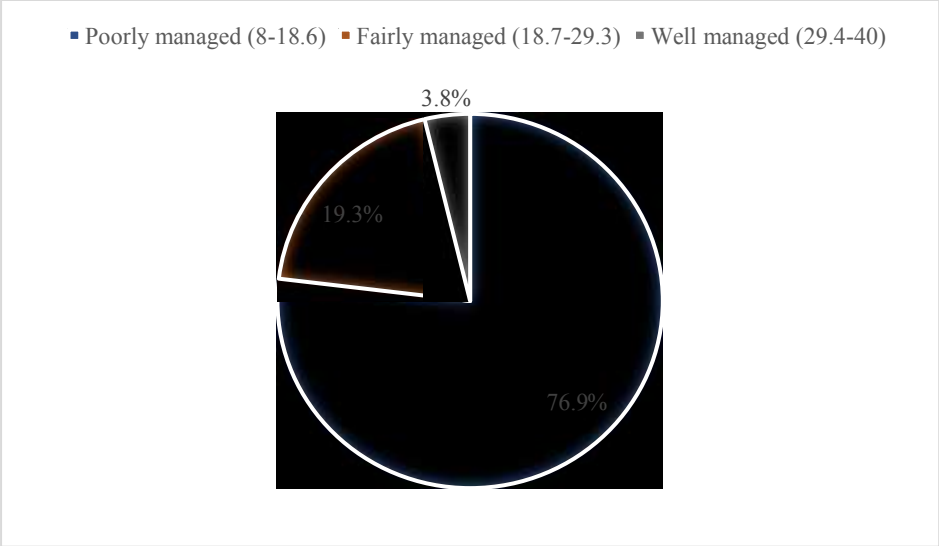

Figure 4: Pie chart showing the level of management practices of woodwork workshop

Source: Field Survey, 2024

Maintenance of woodwork workshop

Results in Table 2 show that the respondents agreed ($\bar{x}$=3.55) that instructions on how to use every equipment in the woodwork workshop were adequately inscribed as a conscious means of ensuring maintenance of the woodwork workshop. The rest of the respondents were indifferent to the following statements that: workshop has sufficient funds to cover all necessary maintenance activities ($\bar{x}$= 3.28), in-house staff are adequately trained in handling the workshop equipment ($\bar{x}$= 3.07), equipment in the woodwork workshop is regularly maintained ($\bar{x}$= 2.71) and adequate measures are put in place to prevent equipment breakdowns ($\bar{x}$= 2.69). However, the grand mean score for the maintenance variables was $\bar{x}$=3.06. As posits by the respondents, this implied that maintaining the woodwork workshop is prioritized.

Table 2: Maintenance of woodwork workshop

Maintenance variables	SA Freq (%)	A Freq (%)	U Freq (%)	D Freq (%)	SD Freq (%)	Ranked mean
Instructions on how to use every equipment in the woodwork workshop are adequately inscribed	47(22.6)	94(45.2)	30(14.4)	-	37(17.8)	3.55
The workshop has sufficient funds to cover all necessary maintenance activities	58(27.9)	39(18.8)	46(22.1)	33(15.9)	32(15.4)	3.28
In-house staff are adequately trained in handling the workshop equipment	44(21.2)	40(19.2)	62(29.8)	10(4.8)	52(25.0)	3.07
Equipment in the woodwork workshop is regularly maintained	32(15.4)	44(21.2)	20(9.6)	55(26.4)	57(27.4)	2.71
Adequate Measures are put in place to prevent equipment breakdowns	43(20.7)	26(12.5)	37(17.8)	28(13.5)	74(35.6)	2.69

Grand $\bar{x}$ score= 3.06 **Source**: Field Survey, 2024.

Level of maintenance of woodwork workshop

Results from Figure 5 show the overall level of how woodwork workshops in the study areas are been maintained. According to the respondents, about two-third (59.1%) stipulated that woodwork workshops were fairly maintained, 20.7percent indicated that woodwork workshops were poorly maintained while 20.2percent specified that woodwork workshops were well maintained. It could be deduced that woodwork workshops were fairly managed and this would un-turn influence woodwork workshop functionality in the study areas.

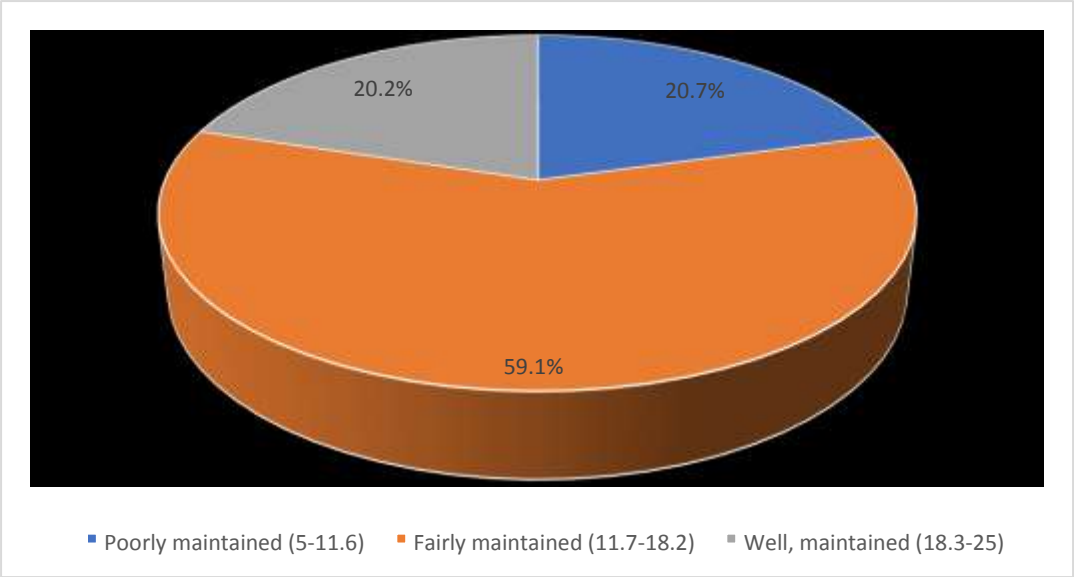

Figure 5: Pie chart showing the level of maintenance of woodwork workshop **Source:** Field Survey, 2024.

Adequacy of resources for woodwork workshop

Assessing the adequacy of resources in the woodwork workshop, the respondents disagreed to the following statements that: allocation of resources to the woodwork workshop is adequate ($\bar{x}$=2.49), productivity assessments are adequately conducted in the woodwork workshop ($\bar{x}$=2.49), productivity level of the woodwork workshop is adequate ($\bar{x}$=2.32), additional financial resources allocated to the woodwork workshop are adequate ($\bar{x}$=1.99), organizing staff training and development for woodwork are adequate ($\bar{x}$=1.93), workshop uses high-quality wood materials for projects ($\bar{x}$=1.58) and the respondents strongly disagreed that availability of materials of the woodwork workshop is adequate ($\bar{x}$=1.38). However, the grand mean score for the management variables was $\bar{x}$=2.03. This implies that allocation of resources for the woodwork workshop is poor.

Table 3: Adequacy of resources for woodwork workshop

Adequacy variables	SA Freq (%)	A Freq (%)	U Freq	D Freq (%)	SD Freq (%)	Ranked mean
The allocation of resources to the woodwork workshop is adequate	8(3.8)	33(15.9)		50(24.0)	53(25.5)	2.49
Productivity assessments are adequately conducted in the woodwork workshop	58(27.9)	22(10.6)	-	12(5.8)	116(55.8)	2.49
The productivity level of the woodwork workshop is adequate	8(3.8)	38(18.3)	24(11.5)	80(38.5)	58(27.9)	2.32
The additional financial resources allocated to the woodwork workshop are adequate	4(1.9)	10(4.8)	37(17.8)	86(41.3)	71(34.1)	1.99
Organizing Staff training and development for woodwork are adequate	4(1.9)	-	28(13.5)	121(56.2)	55(26.4)	1.93
The workshop uses highquality wood materials for projects	14(6.7)	-	-	64(30.8)	130(62.5)	1.58
The availability of materials of the woodwork workshop is adequate	14(6.7)	-	-	22(10.6)	172(82.7)	1.38

Grand $\bar{x}$ score= 2.03 **Source**: Field Survey, 2024.

Adequacy level of resource allocation for woodwork workshop

Results from Figure 6 show the overall level of how resources are allocated to woodwork workshops in the study areas. According to the respondents, about two-third (64.9%) stipulated those resources for woodwork workshops were not adequate,33.2percent indicated moderate adequacy and very few (1.9%) indicated that resources were adequately allocated for woodwork workshop. It could be deduced from the findings that resources allocation for woodwork workshop were inadequate in the study areas.

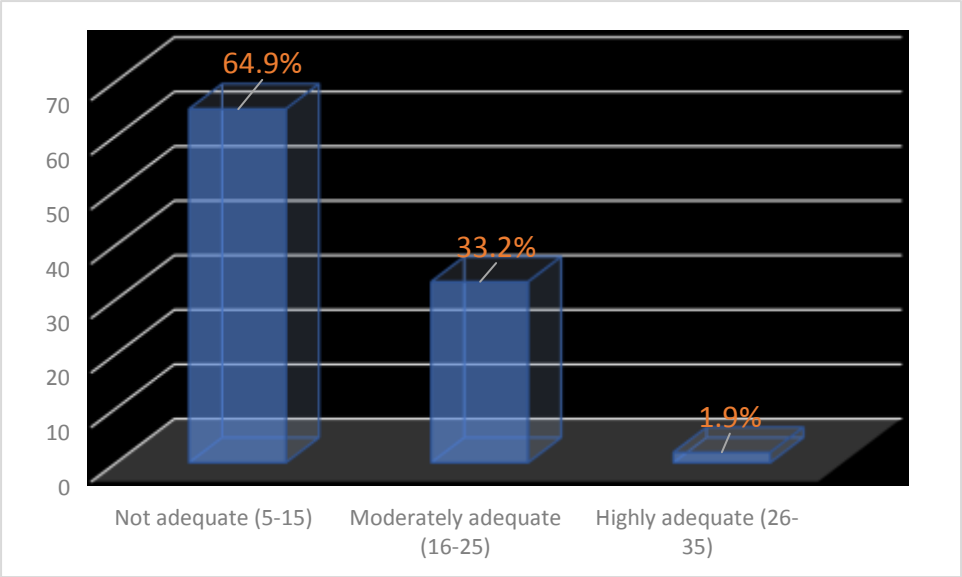

Figure 6: Pie chart showing the level of resource allocation for woodwork workshop
Source: Field Survey, 2024

Hypothesis

Results of Correlation Analysis

Results in table 4 show that management (r = 0.211) had significant and positive relationship with the efficiency/functionality of the woodwork workshop at $p \leq 0.01$. This implies that when there is good management of woodwork workshop, efficiency will be enhanced. In summary, the more employing experts in the field of woodwork is prioritised and assessing its productivity regularly, the more the efficiency of woodwork workshop in the study areas.

Table 4: Result of correlation analysis showing the relationship between management of woodwork workshop and its efficiency

Variable	r-value	P-value	Decision
Management of woodwork workshop and efficiency	0.211**	0.01	S

**Significant at $P \leq 0.01$
S = Significant
r = correlation co-efficient

Source: Field survey, 2024

Conclusion

Based on the findings of this study, management, maintenance and adequacy of resources for woodwork workshop is very essential in enhancing efficiency/productivity of woodwork workshop. All the categories of the respondents (instructor, workshop managers and students) were still in their active age, educationally advantaged and highly experienced in woodwork activities. Majority of the respondents indicated that woodwork workshops were poorly managed, more than half indicated fair maintenance level of the woodwork workshop and about two-third specified that woodwork resources were not adequate respectively. Further findings show that management had a positive and significant relationship with efficiency of

woodwork workshop. This implied that the more employing experts in the field of woodwork is prioritised and assessing its productivity regularly, the more the efficiency of woodwork workshop. Therefore, stakeholders in Nigeria's technical education sector should provide critical insights into the management, maintenance, resource allocation, adopting sustainable practices, enhancing safety protocols, and fostering partnerships between colleges and industry stakeholders to bridge the skills gap within woodwork workshops in Colleges of Education (Technical), because enhancing the operational efficiency of these workshops has the potential to improve the quality of technical education. It is also imperative to ensure that woodwork students receive effective and hands-on training regular.

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