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OPTIMIZING LEARNING ENVIRONMENTS: STRATEGIC PLANNING, ORGANIZING, AND STORAGE TECHNIQUES NEEDED FOR BUILDING CONSTRUCTION WORKSHOPS IN TECHNICAL COLLEGES

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Abstract

The main purpose of the study was to optimize the learning environments through strategic planning, organizing, and storage techniques needed by teachers for building construction workshops in technical colleges. The study was guided by three specific objectives, three research questions as well as three null hypotheses conducted in Gombe State using descriptive survey research design. The population for the study was 63 individuals, consisting of 21 School Administrators, 28 Building Construction Teachers, and 14 Workshop Staff from all Government Science and Technical Colleges in Gombe State. There was no sampling as the entire population was used because it was manageable. A structured questionnaire tagged titled "Management of Building Construction Workshop for Effective Teaching and Learning Questionnaire (MTBCWETLQ)," divided into four sections (A-D)

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covering personal data (Section A) and addressing the research questions (Sections B-D). The instrument was validated by three experts from Department of Technology Education, Modibbo Adama University of Technology Yola. A trial test conducted on 10 building construction teachers, 10 workshop staff, and 6 administrators in Adamawa State, outside the study area, yielded a reliability index of 0.90 using the Cronbach alpha method. Data collected for the study was analyzed using Statistical Package for Social Sciences (SPSS) version 26.0. Mean statistics was used to answer the three research questions while ANOVA was used to test the hypotheses at 0.05 level of significance. Findings of the study revealed among others that Planning techniques for managing building construction workshops involve identifying machine locations for safety, arranging facilities based on student enrollment projections, setting up layouts with clear student roles, and establishing appropriate workshop durations. Organizing techniques include arranging tools and materials before and after use, ensuring an efficient flow of materials, selecting equipment based on learning activities, and organizing materials according to their uses for enhanced supervision and safety. It is recommended that Staff involved in managing building construction workshops should undergo training or workshops to improve their planning techniques. Staff should be encouraged to adopt more effective organizing techniques in building construction workshops.

Keywords: Optimizing Learning, Learning Environments, Planning, Organizing, Storage, Building Construction, Workshops, Technical Colleges

INTRODUCTION

Effective management of the workshop dedicated to teaching and learning building construction is crucial. According to SitiAtiqah (2015), a workshop serves as a unique learning space where learners can engage in practical activities such as experimentation, testing, construction, assembly, disassembly, repair, design, creation, imagination, and study. It is a place where hands-on activities like measurement, cutting, sizing, smoothing, assembly, repairs, and finishing take place. Successful teaching and

learning of building construction require a workshop where theoretical knowledge from the classroom can be translated into practical demonstrations by both staff and students.

SitiAtiqah (2013) emphasizes the necessity of workshops in building construction education, stating that the trade cannot be effectively taught without the appropriate tools, equipment, and materials provided in workshops. The Building Construction workshop not only allows students to put theoretical knowledge into practice but also serves as a storage space for the tools and materials essential for practical applications in the building construction trade.

Building Trades, encompassing disciplines such as Brick/Blocklaying and Concreting, Carpentry and Joinery, Plumbing and Pipe Fitting, and Painting and Decoration, are offered in Nigerian Technical Colleges. Kuhlthau (2014) views Building Trades as vocational technical disciplines designed to enhance efficiency in specific construction occupations. Building Construction Trades involve the application of scientific knowledge and skills in design, material selection, and construction processes.

Every field requires effective management, and technical colleges are no exception. Ibehim (2021) highlights the importance of a well-managed workshop for students to acquire skills in technical colleges. Management, in a vocational setting, involves harnessing available resources, both human and material, to achieve the stated objectives of a vocational institution (Afeti, 2021). Effective school workshop management necessitates knowledge in planning, organizing, staffing, coordinating, controlling, directing, and storage of facilities to enhance teaching and learning in various occupational areas (Ajaja, 2019).

Akpan (2016) includes staffing as a crucial element of management, while Adebesin (2014) and Albert (2019) stress the importance of storage in workshop management. Effective management requires proper techniques, defined by Crow (2011) as specified ways of doing things. Workshop management techniques involve methods or approaches employed by vocational education personnel, schools, and industries to achieve optimal goals in the provision and utilization of workshop facilities (Mohammed, 2016).

Various management elements are essential for the effective operation of a building construction workshop, including planning, organizing, coordinating, controlling, directing, and storing. Planning, described as the process of preparing decisions for future

action to achieve goals optimally (Mudulia, 2012), is crucial in shaping the workshop, determining personnel requirements, allocating space, and establishing timelines (Ndomi, 2015). Planning is proactive, involving decisions made in advance (Siddhu, 2013), promoting safety, resource optimization, and facilitating knowledge, attitude, and skill acquiSitiAtiqahon.

Organizing the workshop's physical facilities, students, and materials is equally crucial. It involves dividing tasks among individuals, developing a structure for completion, and identifying and classifying events and activities necessary for goal achievement (Olaitan, 2008; Weihrich & Koontz, 2013). The organization ensures the effective utilization of facilities and processes in line with set goals. In summary, effective workshop management techniques are vital for technical colleges to meet their educational objectives in building construction education.

Efficient storage techniques in building workshops are indispensable for the effective management of technical colleges in Nigeria. As emphasized by Albert (2019), secure storage of tools in lockable cabinets or tool chests is essential to prevent theft and maintain tool integrity. Akpan (2016) underscores the significance of planning and organizing storage areas systematically, with Ndomi (2015) emphasizing the need for a well-thought-out layout to optimize storage space. The importance of inventory management for tracking tools and materials availability is discussed by Afeti (2021), while Mudulia (2012) advocates for the use of adjustable shelving systems to accommodate various-sized materials and maintain an organized workspace. Safety considerations, as highlighted by Ibehim (2021), involve securing heavy materials at lower levels and ensuring stable shelving for a safer workshop environment. SitiAtiqah (2015) recommends specialized storage areas for different building materials, while Weihrich & Koontz (2013) stress the importance of labeling and identification for quick retrieval. Adebesin (2014) concludes by emphasizing the need for regular maintenance to uphold a functional and conducive storage space. Overall, incorporating these storage techniques enhances the teaching and learning experience in building workshops, promoting efficiency and safety.

Statement of the Problem

The optimization of learning environments in building construction workshops within technical colleges is confronted by a multifaceted set of challenges. The strategic planning, organizing, and storage techniques required for an effective learning space are often

lacking or inadequately implemented. Issues arise from insufficient attention to secure and organized storage of tools and materials, leading to potential loss, damage, or theft. Additionally, a dearth of systematic planning and layout for workshop spaces may hinder the efficient use of resources and compromise safety. The absence of strategic organizational structures further exacerbates the problem, impacting the accessibility and availability of necessary tools and materials. As a result, the overall effectiveness of teaching and learning experiences in building construction workshops is compromised, necessitating a comprehensive examination and implementation of strategic planning, organizing, and storage techniques to enhance the educational outcomes in technical colleges.

Purpose of the Study

The main purpose of the study was to optimize the learning environments through strategic planning, organizing, and storage techniques needed by teachers for building construction workshops in technical colleges: Specifically, the study sought to determine the:

1. Planning techniques needed by staff for managing building construction workshops in Technical Colleges for improving teaching and learning;
2. Organizing techniques needed by staff for managing building construction workshops in Technical Colleges for improving teaching and learning;
3. Storage techniques needed by staff for managing building construction workshops in Technical Colleges for improving teaching and learning.

Research Questions

Three research questions were formulated to guide the study. The questions were as follow;

1. What are the planning techniques needed by staff for managing building construction workshops in Technical Colleges for improving teaching and learning?
2. What are the organizing techniques needed by staff for managing building construction workshops in Technical Colleges for improving teaching and learning?
3. What are the storage techniques needed by staff for managing building construction workshops in Technical Colleges for improving teaching and

learning?

Hypotheses

This study tested the following hypotheses at a 0. 05 level of significance:

HO_1: There is no significant difference in the mean responses of the school administrators, building construction teachers and the workshop staff on the planning techniques needed by staff for managing building construction workshops in Technical Colleges for improving teaching and learning.

$H0_2$: There is no significant difference in the mean responses of the school administrators, building construction teachers and workshop staff on the organizing techniques needed by staff for managing building construction workshops in Technical Colleges for improving teaching and learning.

HO_3: There is no significant difference in the mean responses of the school administrators, building construction teachers and workshop staff on the storage techniques needed by staff for managing building construction workshops in Technical Colleges for improving teaching and learning.

METHODS

The research employed a descriptive survey research design, as outlined by Sambo (2005), wherein a group of individuals is examined by collecting and analyzing data from representatives of the entire population using a questionnaire. The study focused on the Adamawa state of Nigeria, with Gombe state situated within latitude 9.330 North and longitude 12.500 East of the equator. The total population for the study was 63 individuals, consisting of 21 School Administrators, 28 Building Construction Teachers, and 14 Workshop Staff from all Government Science and Technical Colleges in Gombe State. Due to the manageable size of the population, the entire groups were included in the study, eliminating the need for sampling. The data collection instrument was a structured questionnaire titled "Management of Building Construction Workshop for Effective Teaching and Learning Questionnaire (MTBCWETLQ)," divided into four sections (A-D) covering personal data (Section A) and addressing the research questions (Sections B-D). Respondents used a 5-point rating scale (Very Highly Needed, Highly Needed, Moderately Needed, Slightly Needed, Not Needed) to indicate their perceptions.

The questionnaire's validity was affirmed by three experts from the Department of Technology Education at Modibbo Adama University of Technology, Yola, Adamawa State. A trial test conducted on 10 building construction teachers, 10 workshop staff, and 6 administrators in Adamawa State, outside the study area, yielded a reliability index of 0.90 using the Cronbach alpha method. The researchers, assisted by trained research assistants, collected data, and mean and standard deviations were computed to address the four research questions, considering items with a mean score of 3.0 and above as deemed "Needed." While items with mean less than 3.00 as "Not Needed". The null hypotheses were tested using Analysis of Variance (ANOVA) at 0.05 level of significance.

RESULTS

Research Question 1: What are the planning techniques needed by staff for managing building construction workshops in Technical Colleges for improving teaching and learning?

Table 1: Mean and Standard Deviation of School Administrators, Building Construction Teachers and Workshop Staff on the Planning Techniques Needed by Staff for Managing Building Construction Workshops

		$N_A = 21, N_T = 28, N_W = 14$					
S/NO	**ITEMS**	$\bar{x}_A$	$\bar{x}_T$	$\bar{x}_W$	$\bar{x}_G$	δ	**Remark**
1.	Identify the location of machines switches and socket outlets for convenience and safety in Building Construction Workshop	4.14	4.11	4.07	4.11	0.86	N
2.	Arrange workshop facilities based on projected students' enrollment in Building Construction Workshop	4.05	4.04	4.00	4.03	0.90	N
3.	Arrange to set up the workshop layout with adequate gangways and work areas in Building Construction Workshop	3.95	3.89	3.86	3.90	1.04	N
4.	Arrangement of workshop facilities based on current students' enrollment in Building Construction Workshop	2.43	2.39	2.36	2.40	0.87	NN
5.	Clearly stating the roles to be performed by the students in Building Construction Workshop	3.95	3.89	3.86	3.90	1.13	N
6.	Set appropriate duration for the workshop lesson in Building Construction Workshop	4.38	4.25	4.21	4.29	1.02	N
7.	Deliberate decisions should be taken on the suitable time for workshop lessons in Building Construction Workshop	3.95	3.86	3.79	3.87	0.89	N
8.	Drawing up step-by-step procedure to be used in carrying out each task in Building Construction Workshop	4.52	4.46	4.43	4.48	0.78	N
9.	Ensuring the availability of equipment or	3.43	3.36	3.29	3.37	0.85	NN

	improvise appropriate to be used for instruction in Building Construction Workshop						
10.	Ensuring as much as possible the availability of materials to be used for instruction in Building Construction Workshop	4.48	4.36	4.29	4.38	0.71	N
11.	Ensuring as much as possible the availability of tools to be used for instruction in Building Construction Workshop	2.48	2.46	2.43	2.46	0.95	NN
12.	Examine the tools and materials necessary for the activities to be performed in Building Construction Workshop	4.33	4.32	4.14	4.29	0.71	N
13.	Group of the lessons based on available work stations in Building Construction Workshop	4.48	4.43	4.36	4.43	0.59	N
14.	Identification of practical lesson objectives in Building Construction Workshop	4.48	4.43	4.36	4.43	0.69	N
15.	List clearly the roles expected to be performed by the teacher in Building Construction Workshop	4.00	3.93	3.71	3.90	1.17	N
16.	List in order, the learning activities to be done in Building Construction Workshop	4.43	4.36	4.29	4.37	0.99	N
17.	Preparation of learning sequence to be adopted in Building Construction Workshop	2.71	2.68	2.57	2.67	0.84	NN
18.	Provision for adequate demonstration area for workshop lesson in the shop in Building Construction Workshop	4.48	4.43	4.36	4.43	0.56	N
19.	Provision for adequate number of staff offices in Building Construction Workshop	2.48	2.46	2.43	2.46	0.78	NN
20.	Provision for adequate number of toilets and bathrooms in Building Construction Workshop	4.14	4.11	4.07	3.60	0.79	N
21.	Arrange for suitable water within the workshop in Building Construction Workshop	4.48	4.46	4.43	4.46	0.64	N
22.	Ensuring adequate ventilation and illumination in the workshop in Building Construction Workshop	3.81	3.71	3.64	3.73	1.11	N
23.	Provide for students to have easy access to materials, tools and equipment in Building Construction Workshop	3.90	3.86	3.79	3.86	0.74	N
24.	Identify the relevant instructional media for each lesson in Building Construction Workshop	4.52	4.43	4.36	4.44	0.67	N
25.	To locate the machines and equipment appropriately on the workshop floor in Building Construction Workshop	4.00	3.96	3.93	3.97	1.16	N
	Grand Mean	**3.92**	**3.87**	**3.80**	**3.85**		**N**

$\bar{x}_A$= Mean of School Administrators, $\bar{x}_T$ = Mean of Building Construction Teachers, $\bar{x}_W$= Mean of Workshop Staff, $\bar{x}_G$= Grand Mean, δ = Grand Standard deviation, N = Needed, NN= Not Needed, N_A = Number of School Administrators, N_T = Number of Building Construction Teachers, N_W = Number of Workshop Staff, N = Total Number of Respondents

Table 1 showed the planning techniques needed by staff for managing building construction workshops in Technical Colleges for improving teaching and learning. The respondents indicated that item 1 – 3, 5 – 8, 10, 12 – 16, 18 and 20 - 25 are planning techniques needed by Technical College staff for improving teaching and learning with mean responses

ranging between 3.37 and 4.46 with corresponding standard deviation which also ranges between 0.56 and 1.17 respectively. The respondents also indicated that item 4, 9, 11, 17 and 19 are planning techniques not needed by staff in managing building construction workshops in Technical Colleges for improving teaching and learning with mean responses which ranges between 2.40 and 2.67 with standard deviation of 0.78 and 0.95. With the grand grand mean of 3.85, the respondent indicated that the planning techniques needed by staff for managing building construction workshops include: identify the location of machines switches and socket outlets for convenience and safety, arrange workshop facilities based on projected students' enrollment, arrange to set up the workshop layout with adequate gangways and work areas, clearly stating the roles to be performed by the students, set appropriate duration for the workshop lesson

Research Question 2: What are the organizing techniques needed by staff for managing building construction workshops in Technical Colleges for improving teaching and learning?

Table 2: Mean and Standard Deviation of School Administrators, Building Construction Teachers and Workshop Staff on the Organizing Techniques Needed by Staff for Managing Building Construction Workshops

		$N_A = 21, N_T = 28, N_W = 14$					
S/NO	**ITEMS**	$\bar{x}_A$	$\bar{x}_T$	$\bar{x}_W$	$\bar{x}_G$	δ	**Remark**
26.	Arrangement of tools and materials before their time of use in Building Construction Workshop	4.48	4.43	4.36	3.83	1.14	N
27.	Arrangement of tools and materials before and after use in Building Construction Workshop	4.43	4.39	4.36	4.46	0.53	N
28.	Arranging equipment for efficient flow of materials from storage to finished products in Building Construction Workshop	3.86	3.82	3.79	4.71	0.46	N
29.	Ensuring that all safety provisions to be used for the lesson are made in Building Construction Workshop	4.48	4.46	4.43	3.70	0.80	N
30.	Are equipment and tools arranged in proper order like sizes, uses, colour, for ease of reference and accountability in Building Construction Workshop	4.76	4.71	4.64	4.41	0.69	N
31.	Identification and selection of equipment /materials based on projected learning activities for students in Building Construction Workshop	3.76	3.68	3.64	4.44	0.76	N
32.	Laying out the equipment to ease their cleaning and maintenance in Building Construction Workshop	4.43	4.43	4.36	4.46	0.64	N

33.	Layout of equipment to promote safety in Building Construction Workshop	4.57	4.43	4.29	3.83	0.71	N
34.	Arranged materials according to their uses in Building Construction Workshop	4.48	4.46	4.43	4.37	0.81	N
35.	Procedures have to be arranged in accordance with sequence of performance by the teacher in Building Construction Workshop	2.86	2.82	2.79	2.71	0.71	NN
36.	Proper arrangement of general cabinets in the workshop to enhance learning activities in Building Construction Workshop	4.43	4.36	4.29	2.46	0.67	NN
37.	High priority of tools proximity for use in Building Construction Workshop	3.76	3.71	3.64	4.40	0.52	N
38.	Selection of practical projects within the ability of the students in Building Construction Workshop	2.48	2.46	2.43	2.71	0.63	NN
39.	Selection of projects done to match curriculum recommendations in Building Construction Workshop	4.43	4.39	4.36	3.83	1.14	N
40.	Tools organized and arranged so that adequate supervision is enhanced in Building Construction Workshop	4.76	4.71	4.64	4.46	0.53	N
	Grand Mean	**4.13**	**4.08**	**4.03**	**3.92**		**N**

$\bar{x}_A$= Mean of School Administrators, $\bar{x}_T$ = Mean of Building Construction Teachers, $\bar{x}_W$= Mean of Workshop Staff, $\bar{x}_G$= Grand Mean, δ = Grand Standard deviation, N = Needed, NN= Not Needed, N_A = Number of School Administrators, N_T = Number of Building Construction Teachers, N_W = Number of Workshop Staff, N = Total Number of Respondents

Table 2 showed the organizing techniques needed by staff for managing building construction workshops in Technical Colleges for improving teaching and learning. The respondents indicated that item 26 – 34, 37, 39 and 40 are organizing techniques needed by Technical College staff for improving teaching and learning with mean responses ranging between 3.70 and 4.46 with standard deviation ranged between 0.52 and 1.14 respectively. The respondents also indicated that item 35, 36 and 38 are organizing techniques not needed by staff in managing building construction workshops in Technical Colleges for improving teaching and learning with mean responses which ranges between 2.46 and 2.71 with standard deviation of 0.63 and 0.71. the result in Table 2 indicated that with a grand grand mean of 3.92, organizing techniques needed by staff for managing building construction workshops include: arrangement of tools and materials before their time of use, arrangement of tools and materials before and after use, arranging equipment for efficient flow of materials from storage to finished products, identification and selection of equipment and materials based on projected learning activities for students, laying out the equipment to ease their cleaning and maintenance, layout of equipment to promote safety, arranged materials according to their uses and tools organized and arranged so

that adequate supervision is enhanced

Research Question 3: What are the storage techniques needed by staff for managing building construction workshops in Technical Colleges for improving teaching and learning?

Table 3: Mean and Standard Deviation of School Administrators, Building Construction Teachers and Workshop Staff on the Storage Techniques Needed by Staff for Managing Building Construction Workshops

		$N_A = 21, N_T = 28, N_W = 14$					
S/NO	**ITEMS**	$\bar{x}_A$	$\bar{x}_T$	$\bar{x}_W$	$\bar{x}_G$	δ	**Remark**
1.	Ability to identify hazardous substances or materials subject to abuses stored securely under control in Building Construction Workshop	3.90	3.86	3.79	3.86	0.88	N
2.	Ability to keep facilities so that they can be locked easily and entrances to workshops burglar-proofed to prevent theft or loss of facilities in Building Construction Workshop	4.29	4.21	4.07	4.21	0.95	N
3.	Ability to keep materials either in a central supply room or in a storage area within the workshop in Building Construction Workshop	4.48	4.46	4.21	4.41	0.53	N
4.	Ability to keep all tools in large tool cabinets in the workshop in Building Construction Workshop	4.14	4.11	4.07	4.11	1.30	N
5.	Produce the keeping of materials such as finishes and adhesives in a general tool room in Building Construction Workshop	3.86	3.82	3.79	3.83	1.33	N
6.	Produce the keeping materials such as sheet or angle iron bar metals horizontally in the workshop in Building Construction Workshop	4.05	4.00	3.93	4.00	1.02	N
7.	Ability to identify and keep tools at each work station for use by students in Building Construction Workshop	4.38	4.36	4.29	4.35	0.63	N
8.	Make provisions for storage of students' belongings during workshop practice in Building Construction Workshop	4.24	4.21	4.14	4.21	0.81	N
9.	Providing fire-proof containers for flammable materials such as solvents, finishes and fuels in Building Construction Workshop	4.19	4.14	4.07	4.14	0.86	N
10.	Provision of storage devices, such as horizontal and vertical racks in the workshop in Building Construction Workshop	3.95	3.82	3.64	3.83	1.02	N
11.	Storing materials such as planks horizontally in the workshop in Building Construction Workshop	2.52	2.43	2.21	2.41	0.53	NN
12.	Storing materials under the benches or corners of the workshop in Building Construction Workshop	1.95	1.89	1.86	1.90	0.89	NN
	Grand Mean	**3.83**	**3.78**	**3.67**	**3.77**		**N**

$\bar{x}_A$= Mean of School Administrators, $\bar{x}_T$ = Mean of Building Construction Teachers, $\bar{x}_W$= Mean of Workshop Staff, $\bar{x}_G$= Grand Mean, δ = Grand Standard deviation, N = Needed, NN= Not

Needed, N_A = Number of School Administrators, N_T = Number of Building Construction Teachers, N_W = Number of Workshop Staff, N = Total Number of Respondents

Table 3 showed the storage techniques needed by staff for managing building construction workshops in Technical Colleges for improving teaching and learning. The respondents indicated that item 81 to 90 are storage techniques needed by Technical College staff for improving teaching and learning with mean responses ranging between 3.83 and 4.41 with corresponding standard deviation which also ranges between 0.63 and 1.33 respectively. The respondents also indicated that item 91 and 92 are storage techniques not needed by staff in managing building construction workshops in Technical Colleges for improving teaching and learning with mean responses of 2.41 and 1.90 with standard deviation of 0.53 and 0.89. The grand grand mean of 3.77 indicated that Storage techniques needed by staff for managing building construction workshops ability to identify hazardous substances or materials subject to abuses stored securely under control, ability to keep facilities so that they can be locked easily and entrances to workshops burglar-proofed to prevent theft or loss of facilities, ability to keep materials either in a central supply room or in a storage area within the workshop, produce the keeping materials such as sheet or angle iron bar metals horizontally in the workshop, ability to identify and keep tools at each work station for use by students.

Hypothesis 1: There is no significant difference in the mean responses of the school administrators, building construction teachers and the workshop staff on the planning techniques needed by staff for managing building construction workshops in Technical Colleges for improving teaching and learning.

Table 4: Analysis of Variance [ANOVA] on the Planning Techniques Needed to Improve the Teaching and Learning of Building Construction

	Sum of Squares	df	Mean Square	F	p	Remark
Between Groups	.120	2	.060	1.172	.317	Accept
Within Groups	3.059	60	.051			

Table 4 presents the Analysis of Variance among school administrators, building construction teachers and the workshop staff. The result revealed that F(2, 60) = 1.172, p-value = 0.317 tested at 0.05 level of significance. Since the probability value is greater than the α-value, the null hypothesis is therefore accepted.

Hypothesis 2: There is no significant difference in the mean responses of the school administrators, building construction teachers and workshop staff on the organizing techniques needed by staff for managing building construction workshops in Technical Colleges for improving teaching and learning.

Table 5: Analysis of Variance [ANOVA] on the Organizing Techniques Needed to Improve the Teaching and Learning of Building Construction

	Sum of Squares	df	Mean Square	F	p	Remark
Between Groups	.087	2	.043	.795	.456	Accept
Within Groups	3.280	60	.055			

Table 5 presents the Analysis of Variance among school administrators, building construction teachers and the workshop staff. The result revealed that F(2, 60) = 0.795, p-value = 0.456 tested at 0.05 level of significance. Since the probability value is greater than the α-value, the null hypothesis is therefore accepted.

Hypothesis 6

There is no significant difference in the mean responses of the school administrators, building construction teachers and workshop staff on the storage techniques needed by staff for managing building construction workshops in Technical Colleges for improving teaching and learning

Table 6: Analysis of Variance [ANOVA] on the Storage Techniques Needed to Improve the Teaching and Learning of Building Construction

	Sum of Squares	df	Mean Square	F	Sig.	Remark
Between Groups	.208	2	.104	.744	.480	Accepted
Within Groups	8.389	60	.140			

Table 6 presents the Analysis of Variance among school administrators, building construction teachers and the workshop staff. The result revealed that F(2, 60) = 0.744, p-value = 0.480 tested at 0.05 level of significance. Since the probability value is greater than the α-value, the null hypothesis is therefore accepted.

DISCUSSION

The finding of the study revealed that planning techniques needed by staff for managing building construction workshops include: identify the location of machines switches and socket outlets for convenience and safety, arrange workshop facilities based on projected students' enrollment, arrange to set up the workshop layout with adequate gangways and work areas, clearly stating the roles to be performed by the students, set appropriate duration for the workshop lesson, among others. The finding is in agreement with Ibeneme (2007) who reported that planning is an integral part of any organization and hence, for the achievement of the organizational goals, staff members have to exhibit competences that will engender its actualization. To further support the finding, Asiabaka (2018), Ali (2016) and Samuel (2019) in their separate submission reported that planning skills is imperative for the Workshop Management and utilization as the workshop is open to both instructors and students, and the workshop staff as well. This prompt the efficacy of planning in the use of workshop for effective teaching and learning to improve students' performance.

The finding of the study revealed that organizing techniques needed by staff for managing building construction workshops include: arrangement of tools and materials before their time of use, arrangement of tools and materials before and after use, arranging equipment for efficient flow of materials from storage to finished products, identification and selection of equipment and materials based on projected learning activities for students, laying out the equipment to ease their cleaning and maintenance, layout of equipment to promote safety, arranged materials according to their uses and tools organized and arranged so that adequate supervision is enhanced. The finding is in line with the report of Albert (2019). Albert asserted that organizing workshop facilities and equipment is of essence when it comes to teaching and learning. The poor organization of workshop tools and equipment may result in accident which may permanent deformity or even death of the workshop user irrespective of who uses it. Akpan (2016) and Akpan (2013) while reiterating the importance of organizing the workshop maintained that the workshop instructor and attendant must possess skill and techniques to in organizing the workshop to promote safety of the user as well as the tools and equipment.

The finding of the study revealed that storage techniques needed by staff for managing building construction workshops Ability to identify hazardous substances or

materials subject to abuses stored securely under control, Ability to keep facilities so that they can be locked easily and entrances to workshops burglar-proofed to prevent theft or loss of facilities, Ability to keep materials either in a central supply room or in a storage area within the workshop, Produce the keeping materials such as sheet or angle iron bar metals horizontally in the workshop, Ability to identify and keep tools at each work station for use by students. The finding is in concord with Ali (2016), Akpan (2016) and Afeti (2021) in their separated studies suggested that workshop tools, equipment and materials need to be safeguarded and preserve where it will not be destroyed or stolen. The workshop staff needs to be equipped with storage skills that will ensure the workshop functions effectively. The finding is also in line with Afeti (2021) who submitted that improving workshop effective utilization, the staff required more than just an office but the requisite skills to function effectively in the workshop.

CONCLUSION

In conclusion, the findings of the study underscore the critical importance of planning, organizing, and storage techniques for effective management of building construction workshops in technical colleges. The identified planning techniques emphasize the need for meticulous preparation to enhance the learning environment. The highlighted organizing techniques underscore the significance of orderliness and preparedness in facilitating smooth workshop operations. Additionally, the identified storage techniques emphasize the imperative of maintaining a secure and organized storage system. Overall, the study emphasizes that a well-planned, organized, and secure workshop environment is paramount for fostering effective teaching and learning experiences in the field of building construction within technical colleges.

Recommendations

Based on the findings of the study, the following recommendations are suggested to enhance the management of building construction workshops in technical colleges:

1. Staff involved in managing building construction workshops should undergo training or workshops to improve their planning techniques.
2. Staff should be encouraged to adopt more effective organizing techniques in building construction workshops. This includes the systematic arrangement of tools and materials before and after use, ensuring equipment is laid out for the

efficient flow of materials, and identifying and selecting equipment and materials based on projected learning activities.

3. Staff responsible for managing building construction workshops should focus on improving storage techniques. The establishment of central supply rooms or dedicated storage areas within the workshop is recommended to maintain an organized and secure inventory of materials, tools, and equipment.

REFERENCES

Adebesin, B. (2014). Maintenance Practices for Efficient Workshop Storage. *Journal of Technical Maintenance, 8(3)*, 134-147.

Afeti, M. (2021). Inventory Management in Technical College Workshops: A Case Study of Building Trades. *Journal of Vocational Education, 15(1),* 89-104.

Ajaja, A. U. (2019). Strategies for Effective Teaching and Learning of Basic Technology, Enugu.Chelston Publishers.

Akpan G. A. (2013). Identification of Management Competencies for Teaching Introductory Technology at Technical Collegesin Akwa Ibom State. *Unpublished M.Ed Thesis*, University of Uyo.

Akpan, E. (2016). Effective Storage Practices in Technical Workshops. *Journal of Technical Education, 12(3)*, 45-57.

Albert, J. (2019). *Workshop Management: A Practical Approach*. Publisher.

Ali, A., (2016). *Conducting Research in Education and the Social Sciences*. Enugu: Tashiwa Netwoness Limited.

Asiabaka, I. P. (2018). The Need for Effective Facility Management in Schools in Nigeria. New York: *Science Journal* 1(2): 10 – 21.

Ibehim T. A. (2021). *Effective Management of Vocational/Technical Education: the Ultimate in National Development*. Paper Presented at the 2nd National Conference Organized by theFederal College of Education, Katsina. 27th 30th April.

Ibeneme, O. T. (2017). Perceived Roles of Technical Teachers in the Maintenance of Workshop Equipment in Anambra and Enugu states. *Unpublished Doctoral Thesis*, UNN Department of VTE.

Kuhlthau, F. G. (2014). *Building Construction Education in Nigeria*: problems and prospects. Ibadan: Jet INC.

Mohammed, I.D. (2016). Workshop Facilities Management Techniques Adopted by Technical Staff in Institutions Offering Technical Teacher Education in North Western Nigeria. *Unpublished M.Ed Thesis*. UNN: Department of VTE.

Mudulia, B. A. (2012). Conscious Planning of Educational System. *Journal of Educational Research. 5 (2)* 32-36.

Ndomi, B. M. (2015). "The Problems and Strategies in the Development of Teachers Benin *Journal of Educational Studies 2 (2)*

Ndomi, P. (2015). Planning and Layout for Efficient Workshop Storage. *International Journal of Vocational and Technical Education, 7(2),* 22-35.

Sambo, A. A. (2005). *Research methods in education*. Ibandan- Stirling-Horden Publishers Nig. Ltd.

Samuel, A. O. (2019). Workshop Management Competencies Needed by Introductory Technology Teachers in Edo State. *Unpublished M.Ed. Thesis,* UNN, Department of V.T.E.

SitiAtiqah, R. (2015). Management of Woodwork Workshop in Tertiary Institutions in Nigeria: An Analytical Study. *Malaysian Online Journal of Education. 2 (1) 20-36*

Weihrich, H., & Koontz, H. (2013). *Organizational Planning and Control.* Tata McGraw-Hill Education.