Effect of Podcast Instructional Methods on General Woodwork Students Retention and Ability in Technical Colleges in FCT, Abuja, Nigeria

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DOI: https://dx.doi.org/10.47772/IJRISS.2024.8090254

Received: 13 September 2024; Accepted: 18 September 2024; Published: 21 October 2024

ABSTRACT

The study sought to determine the effects of basic podcast and vodcast methods on Students' Retention and Ability in General woodwork in Technical Colleges. Two research questions were raised and answered as well as two hypotheses were formulated and tested at 0.05 level of significance. The study adopted pretest–posttest non-equivalent control group design of quasi experimental and factorial design for the study. The study was conducted in Federal Capital Territory (FCT) Abuja, Nigeria. A simple random sampling technique was used to select two technical colleges with 126 students out of a population of 156 year two NTC II general woodwork students in the three technical colleges in FCT. Abuja. The instruments used for data collection was General woodwork Achievement and Retention Tests (GWWRAT). The selected schools are Federal Science and Technical College, Orozo 72 and Government Science and Technical College, Garki 54. The instrument was subjected to face and content validation by three experts. The reliability co-efficient of the instrument was determined as 0.78 using Kuder Richardson 20 (K-R 20). The data for the study was collected by the researcher with the help of two research assistance through physical administration of the instrument. The study employed the use of descriptive statistics using mean and inferential statistics using Analysis of Covariance (ANCOVA) to analyse the data and test the hypotheses. The study found out that, basic podcast and vodcast teaching technique had positive effect on the retention and ability of students taught general woodwork. The study recommended among others that general woodwork teacher should adopt the use of basic podcast and vodcast teaching technique to enhance students' retention and ability.

Keywords: Technical colleges, General woodwork, Podcast, Retention and Ability.

INTRODUCTION

Technical colleges are institutions aimed at equipping individuals (learners) with scientific knowledge and skills that lead to gainful employment. In Nigeria, technical colleges are established to train students in acquiring relevant vocational skills, knowledge, attitudes, thought processes, and character traits that help them develop their intellectual, social, physical, emotional, and economic abilities, fostering self-reliance and contributing to national economic growth and development (Okolie et al., 2019). To ensure the objectives of technical colleges and vocational training centers are fully realized, the Federal Government of Nigeria (FGN) established the National Board for Technical Education (NBTE) in 1977. The NBTE is responsible for coordinating the activities of technical and vocational training centers by setting standards related to facilities, teaching staff, and course accreditation, ensuring alignment with state policies and established requirements. The curriculum at these institutions includes general subjects such as mathematics, English, social studies, civic education, basic science, and religious studies, alongside trade areas like Motor Vehicle Mechanics, Blocklaying and Concreting, Computer Craft Studies, and Woodwork trades (NBTE, 2020).

General Woodwork is one of the trade subjects offered in technical and vocational education, designed to equip learners with knowledge and skills in the art and craft of woodworking. It prepares individuals with the

competencies needed for self-employment and positions as skilled craftsmen in wood-based industries. General Woodwork involves creating items from wood and encompasses activities such as cabinet making, woodturning, carpentry, joinery, and woodcarving. According to Okwori et al. (2013), the General Woodwork curriculum covers skill areas including carpentry and joinery, upholstery, wood machining, and furniture making. The Federal Government of Nigeria (FGN, 2014) states that students who complete the General Woodwork program will have opportunities to either secure employment or establish their own businesses, becoming self-employed and potentially providing employment for others.

Preparing General Woodwork students for successful and productive engagement in the workforce is increasingly recognized as a key responsibility of technical and vocational colleges. To achieve this, students in General Woodwork need proper guidance and preparation for both initial and on-going employment. However, the on-going issue of poor academic performance, including technical subjects like General Woodwork, has been linked to the use of ineffective teaching methods by instructors (Ogbuanya & Owodunni, 2013). Therefore, it is essential to adopt appropriate instructional methods, such as integrating Information and Communication Technology (ICT), to enhance students' engagement, commitment, retention, and learning abilities. Among the various modern technologies that can support instructors in delivering instructional content, basic podcasts and vodcasts are particularly useful tools.

A podcast is a digital media file or a series of files distributed over the internet using syndication feeds for playback on portable media players and personal computers. Research has shown that the educational use of podcasts brings innovative and creative teaching perspectives. Encouraging students and teachers to listen to, use, and produce podcasts enhances their ability to utilize audio and video resources, thereby supporting collaborative learning and the development of shared knowledge. Kay (2012) identifies three types of podcasts: basic podcasts, enhanced podcasts, and vodcasts.

A basic podcast contains only audio content and is the simplest to create and listen to. An enhanced podcast combines audio with video slides and other multimedia elements such as images, photographs, short videos, and chapters, which help users better understand the topics. Essentially, it is a slideshow of learning content accompanied by audio. A vodcast, or video podcast, includes both video and audio files. The teacher's choice of podcast type depends on the instructional strategy and the content to be delivered to the students. This study, however, will focus on two types: basic podcasts and vodcasts. According to Kay (2012), when students are involved in planning and creating their own video podcasts, they learn by investigating, collaborating, and researching, ultimately developing academic-based video podcasts. This approach can be used to enhance students' retention and learning abilities.

Retention is the ability to recall learned concepts and reproduce information previously acquired. According to Chinwendu and Nnoduka (2020), retention measures the duration for which a student can remember content from a specific course. Students are more likely to retain what they have learned when they are actively engaged in the lesson and are provided with rich and adequate learning experiences (Zeynep, 2015). Researchers have identified the use of appropriate instructional methods as one of the key ways to facilitate retention by involving students in active learning. Ugwu et al. (2020) found that the level of retention is largely influenced by the teaching strategies employed during instruction. Kennedy et al. (2016) also noted that students' academic achievement in woodwork could depend on the teaching methodology, motivating factors (both intrinsic and extrinsic), ability, and retention. Therefore, improving retention can significantly enhance students' learning abilities.

Ability enables students to comprehend concepts and transfer that understanding across different situations. It is defined as the consistent and characteristic manner in which a student engages in intellectual activities (Charles et al., 2017). Ability level significantly impacts the pace, amount, and quality of learning, as well as how students retain and apply what they have learned in the classroom (Ezeugwu et al., 2016). In teaching woodwork at technical colleges, instructional strategies should accommodate students of varying ability levels—low, medium, and high. Iji and Herbor-Peters (2015) observed that classroom practices in Nigerian schools often favour students with high ability, leaving others behind. Abakpa and Iji (2011) pointed out that traditional teaching methods tend to widen the achievement gap between high and low-ability students. Therefore, there is a pressing need to explore instructional approaches that enhance learning outcomes for

students at all ability levels, forming the basis for investigating how basic podcast and vodcast methods can improve students' retention and abilities in general woodwork.

Statement of the Problem

Woodwork graduates, who are expected to secure employment in the wood-based industry or demonstrate their skills and resourcefulness by becoming entrepreneurs, often find themselves struggling to find work. The general woodwork curriculum in technical colleges aims to equip students with marketable skills, foundational scientific knowledge, positive attitudes, and practical abilities. However, Umar (2019) noted that general woodwork students from technical colleges frequently lack the essential knowledge and skills required for employment. This issue of graduates not being gainfully employed appears to stem from several underlying factors.

As a woodwork teacher, observations and interactions with students in technical colleges in FCT Abuja have revealed that most students lack the necessary skills to start their own businesses or be employed as skilled craftsmen in the industry, primarily due to their inability to mark and construct simple woodwork joints, which caught the researcher's attention. Igwe and Ikalule (2011) linked students' poor performance in general woodwork to deficiencies in teaching methods, possibly due to the lack of innovative, problem-solving approaches such as guided discovery, critical thinking, and problem-solving techniques. Muhammad et al. (2014) further suggested that this lack of relevant skills and knowledge is largely a result of the continued use of teacher-centered methods in technical colleges.

However, the use of basic podcast and vodcast instructional methods is believed to have the potential to enhance student learning in various subjects, including biology (Bimpe et al., 2016). It is anticipated that these methods may similarly improve retention and ability levels in general woodwork. This study aims to investigate whether employing basic podcast and vodcast instructional methods will significantly impact students' retention and abilities in general woodwork at technical colleges in FCT Abuja.

Aim and Objective of the Study

The aim of this study is to determine the effect of basic podcast and vodcast instructional methods on General woodwork students' interest and ability in technical colleges in FCT Abuja.

Specifically, the study sought to determine;

i. The effect of basic podcast and vodcast instructional methods on students retention in general woodwork in technical colleges in FCT Abuja.
ii. The effect of high, medium and low ability level student's achievement in general woodwork when taught using basic podcast and vodcast methods.

Research Questions

Based on the objectives of the study the following research question were formulated to guide the study

i. What is the effect of basic podcast and vodcast instructional methods on students retention in General woodwork in technical colleges in FCT Abuja?
ii. What is the effect of basic podcast and vodcast instructional methods on high, medium and low ability level student's achievement in General woodwork?

Research Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance to guide the study

HO_1: There is no significant difference between the mean scores on students' retention when taught general woodwork using basic podcast and vodcast instructional methods.

HO_2: There is no significant difference in the mean achievement scores of high, medium and low ability level students in general woodwork when taught using basic podcast and vodcast instructional methods.

METHODOLOGY

The study adopted quasi-experimental design of pretest–posttest non-equivalent control group. The design is most suitable for the study since pre-selection and randomization of groups is often difficult in a school setting, intact classes was used to avoid disruption of normal classes. The study was conducted in Federal Capital Territory, Abuja, Nigeria. FCT is located at the north confluence of river Niger and river Benue. The population of the study was the entire 126 year two (NTC II) students of General woodwork for 2019/2021 academic session in the three technical colleges in FCT. Abuja offering General woodwork. A Multi stage sampling technique was used to select two technical colleges that were used for the study. This includes Federal Science and Technical College, Orozo 72 and Government Science and Technical College, Garki 54. Moreover, a simple random sampling technique was used in assigning the two technical colleges into experiment group (A) and experiment group (B). The experimental group A Federal Science and Technical College, Orozo Abuja received (Basic podcast) instruction while the experimental group (B) Government Science and Technical College, Garki, Abuja received (vodcast) instruction. The population was stratified into different ability levels based on their performance in their previous terminal General woodwork examination. The instrument used to collect data for this study was general woodwork Achievement and Retention Tests (GWWART) The GWWART was subjected to face and content validation by three experts. The reliability coefficient of GWWART was determined at 0.78 using Kuder-Richardson 20 (K-R 20). Nevertheless, item analysis was carried out on the 40 items developed in the GWWART to ensure that, each item in the test is standardized. The study was conducted in 8 weeks' period during which, 5 topics in general woodwork was covered. The study involved three stages which include: administration of pre-test, treatment, posttest and retention test. The pre-test was administered to all the students involved in the study in the first week of the research exercise before both groups are subjected to treatment. After the administration of the pre-test, the students in the experimental group A were taught using basic Podcast instructional method and the students in the experimental group B were taught using vodcast method. The treatment lasted for five weeks after which posttest were administered to both group. Two weeks later, the retention test was applied to both experimental groups.

The collection of data for the study was achieved with the assistance of two research assistants through physical administration of the GWWART to all NTC II general woodwork students to determine their retention and ability level in general woodwork. The study employed the use of descriptive and inferential statistics to analyze the data. Mean and standard deviation were used to answer all the research questions and inferential statistics using Analysis of Covariance (ANCOVA) to test all the hypotheses at .05 level of significance. The ability level of the students was classified and coded into three using the following criteria as agreed by the teachers during the training session base on their previous terminal examination conducted; high 70% and above, medium 40 to 69% and low below 40%. The data collected was analysed using Statistical Package for Social Science (SPSS) version 23. **Results:**

Research Question 1

What is the effect of basic podcast and vodcast instructional methods on students interest in General woodwork in technical colleges?

The data for answering research question one were presented in table 1

Table 1: Mean of pretest-posttest mean retention scores of experimental groups taught general woodwork using basic podcast and vodcast instructional Methods.

Groups	N	Prettest		Posttest		Mean Gain
		Mean	SD	Mean	SD	
Basic Podcast	72	57.27	16.55	59.42	17.22	21.50
Vodcast	54	63.08	21.73	60.15	21.14	31.30

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VIII Issue IX September 2024

Table 1 indicates that the vodcast teaching method is more effective than the basic podcast method in enhancing students' academic retention in General Woodwork. Specifically, the basic podcast group achieved a mean post-test score of 57.27 with a standard deviation of 16.55 and a mean retention test score of 59.42 with a standard deviation of 17.22. The mean gain from the post-test to the retention test for this group was 21.50. In contrast, the vodcast group had a mean post-test score of 63.08 with a standard deviation of 21.73 and a mean retention test score of 60.15 with a standard deviation of 21.14, resulting in a mean gain of 31.30. The analysis shows a significant difference favoring the vodcast method. The vodcast group demonstrated a higher mean retention score compared to the basic podcast group, indicating that the vodcast method is more effective in improving academic retention in General Woodwork.

Research Question 2

What is the effect of basic podcast and vodcast instructional methods on high, medium and low ability level students' achievement in General woodwork?

The data analysis for research question two is shown in Table 2

Table 2: Mean of pretest-posttest mean achievement Scores of high, medium and low ability level students taught general woodwork using basic podcast and vodcast instructional Methods

Ability Level	Basic Podcast						Vodcast					
	Pretest			Posttest			Pretest			Posttest		
	N	Mean	SD	Mean	SD	Mean Gain	N	Mean	SD	Mean	SD	Mean Gain
High	30	28.80	3.50	76.17	4.09	47.37	3	27.00	2.00	81.33	3.22	54.33
Medium	57	25.33	2.53	61.46	5.50	36.13	6	26.17	1.72	65.17	2.64	39.00
Low	26	21.04	7.98	60.15	3.92	39.11	4	23.25	2.75	62.25	2.87	38.25

Table 2 shows that, the high, medium and low ability students taught general woodwork with basic podcast method had pre-test mean achievement scores as follows high has 28.80 with standard deviation of 3.50 and posttest score of 76.17 with standard deviation of 4.09, and mean gain of 47.37, medium has pre-test mean score 25.33 with standard deviation of 2.53 and posttest score of 61.45 with standard deviation of 7.50 and mean gain of 36.13 and low has pre-test mean achievement scores of 21.04 with standard deviation of 7.98 and posttest score of 60.15 with standard deviation 3.92 and mean gain of 39.11. The high, medium and low ability students taught general woodwork with vodcast method had pre-test mean achievement score of high 27.00 with standard deviation of 2.00 and posttest score of 81.33 with standard deviation of 3.22, and mean gain of 54.33, medium has pre-test mean score of 26.17 with standard deviation of 1.72 and posttest score of 65.17 with standard deviation 2.64 and mean gain of 39.00 and low had pre-test mean achievement of 23.25 with standard deviation of 2.75 and posttest score of 62.25 with standard deviation of 2.87 and mean gain of 38.25. This indicated that, students taught general woodwork using vodcast instructional method had higher mean achievement scores than students taught using basic podcast instructional method.

Hypothesis 1

Ho_2: There is no significant difference between the mean retention scores of high, medium and low ability level General Woodwork students taught using Basic podcast and Vodcast Instructional Method.

The data analysis for Hypothesis one is shown in table 3

Table 3: Summary of Analysis of Covariance (ANCOVA) for Test of Significant Difference between the Mean Retention Scores of students taught General Woodwork using Basic podcast and Vodcast Instruction al Method

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	35534.923[a]	2	17767.461	818.326	.000
Intercept	.767	1	.767	.035	.851
Posttest	35528.574	1	35528.574	1636.361	.000
Groups	289.127	1	289.127	13.317	.000
Error	2670.569	123	21.712		
Total	484158.000	126			
Corrected Total	38205.492	125			

a. R Squared = .930 (Adjusted R Squared = .929)

Table 3 shows that basic podcast and vodcast methods as the main effect is significant to students' retention in GWW. This is revealed by the calculated F-value of 13..317 and p-value of 0.000 is less than 0.05. Therefore, the null hypothesis of no significant difference is rejected. This indicates that there is no significant difference in the mean retention scores of GWW students taught with Basic podcast Instructional Method and those taught using Vodcast Instructional Method.

Hypotheses 2

Ho_2: There will be no significance difference between the mean scores on student's ability level in general woodwork when taught using basic podcast and vodcast instructional methods. The data analysis for Hypothesis two is shown in table 4

Table 4: Summary of Analysis of Covariance (ANCOVA) for Test of Significant Difference between the Mean Retention Scores of High, Medium and Low ability students taught general woodwork using basic podcast and vodcast instructional Methods

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	5733.383[a]	3	1911.128	83.574	.000
Intercept	15082.351	1	15082.351	659.557	.000
Pretest	14.893	1	14.893	.651	.421
Ability	4502.369	2	2251.184	98.445	.000
Error	2789.824	122	22.867		
Total	546870.000	126			
Corrected Total	8523.206	125			

a. R Squared = .673 (Adjusted R Squared = .665)

Table 4 shows the F-calculated values for testing the significance difference between the high, medium and low achievement scores of students taught general woodwork using Basic podcast and vodcast teaching methods. The F-calculated value of 98.445 p-value of 0.000 is less than 0.05 .the null hypothesis is rejected. Hence, there is significance difference between the mean achievement scores of high, medium and low ability students taught general woodwork using Basic podcast and vodcast teaching methods. In order to determine the group responsible for the significance difference, post hoc test was carried out as shown in Table 5.

Table 5: Post hoc Test for the Significance Difference between the Cognitive Achievement Scores of High, Medium and Low Ability level Students taught General woodwork using basic podcast and vodcast teaching method

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95%ConfidenceInterval	
					Lower Bound	Upper Bound
High	Low	16.20*	1.205	.000	13.35	19.06
	Medium	14.83*	1.026	.000	12.39	17.26
Low	High	-16.20*	1.205	.000	-19.06	-13.35
	Medium	-1.38	1.059	.398	-3.89	1.14
Medium	High	-14.83*	1.026	.000	-17.26	-12.39
	Low	1.38	1.059	.398	-1.14	3.89

Table 5 reveals p = 0.00 for high level when compared with medium and low level. This indicated that, high ability level is responsible for the significant difference between the cognitive achievement scores of students taught General woodwork using basic podcast and vodcast teaching techniques.

DISCUSSION OF FINDINGS

The findings on student retention, based on the use of basic podcast and vodcast instructional methods in teaching General Woodwork (GWW), are summarized in Table 1. The data indicates a significant improvement in retention among students taught with the vodcast method. Specifically, students in the vodcast group demonstrated higher retention scores compared to those taught with the basic podcast method. This suggests that the vodcast instructional method is more effective in helping students retain what they have learned in GWW. The analysis, as detailed in Table 4.9, further supports this conclusion. The statistical test for significant differences in student retention between the two instructional methods revealed that the vodcast method significantly outperformed the basic podcast method. The F-calculated value of 13.317 and a p-value of 0.000 indicate a significant difference, with the p-value being less than 0.05. Consequently, the null hypothesis was rejected, confirming that the vodcast instructional method significantly enhances student retention in GWW compared to the basic podcast method.

The findings of this study align with the results of Munion (2018), which indicated that students taught using the vodcast method achieved higher retention mean scores in retention tests compared to those taught using traditional methods. This is further supported by Nwachokor et al. (2019), who found that vodcast techniques enhance student productivity, foster creativity, and facilitate academic learning. The effectiveness of the vodcast method is evident as students in the vodcast group engaged in a process that involved watching, studying, and creating their own vodcasts. This interactive approach allowed them to collaborate with peers, enhance their understanding, and retain knowledge more effectively through repeated exposure and peer interaction. While both teaching methods are beneficial for teaching General Woodwork (GWW) in technical colleges, the vodcast method proves to be more effective in promoting student retention and learning.

The findings of this study are consistent with Nesrin and Yasemin (2010), who observed a significant difference in mean scores between students using video podcasts and those using CD methods. Similarly, Taslibeyaz et al. (2017) found that in medical education, video watching significantly benefited clinical skills acquisition, attitude change, cognitive learning, and knowledge retention. These results suggest that the vodcast teaching method is highly effective in enhancing student learning outcomes and retention. By actively involving students in the learning process, vodcasts improve their study engagement and retention of knowledge.

The results regarding the impact of ability levels on students' achievement when taught using basic podcast and vodcast methods, as detailed in Table 4 of research question two, indicate significant differences in performance among high, medium, and low ability students. Both high, medium, and low ability students showed notable improvement in their academic achievement when exposed to these instructional methods, as evidenced by comparisons of their pre-test and post-test results. This suggests that both basic podcast and vodcast methods are effective in enhancing the academic performance of students at various ability levels in general woodwork within technical colleges. These findings are consistent with Abakpa and Iji (2011), who noted a positive correlation between effective teaching approaches and student achievement across different ability levels in mathematics. Similarly, Adeyemo (2010) found that students' ability significantly influences problem-solving tasks. The study concludes that while both instructional methods are beneficial for teaching general woodwork, vodcast is particularly more effective in improving the academic achievement of students across all ability levels.

CONCLUSION

Based on the study's findings regarding the effects of basic podcast and vodcast methods on students' retention and ability in general woodwork, it was determined that both methods are effective in enhancing these aspects. However, the study highlighted that the vodcast teaching method is particularly more effective than the basic podcast method in improving students' retention and ability in general woodwork. The results indicate that both instructional methods can significantly enhance students' engagement and performance in teaching and learning activities, both inside and outside the classroom. Additionally, the study has contributed to the field by providing general woodwork teachers with a lesson plan that incorporates basic podcast and vodcast instructional methods, offering a practical resource for teaching general woodwork modules.

RECOMMENDATIONS

i. Woodwork instructors should implement the vodcast instructional method in technical colleges to improve students' academic retention and ability in general woodwork.

ii. The Federal and State Ministries of Education should organize regular workshops and seminars for general woodwork teachers to emphasize the importance of using vodcasts for teaching.

iii. The Federal Ministry of Education and curriculum developers should integrate the vodcast instructional method into future curriculum designs to boost students' retention and ability levels in general woodwork.

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