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The JIEST is a multi-disciplinary Journal that contains research findings on diverse topics in Information, Education, Science and Technology. The Editorial Board receives articles throughout the year.

My unreserved appreciation goes to the Dean, School of Science and Technology Education of the above University for his tireless efforts in making sure that the demand of the Editorial Board are always met, I thank the University management for assisting in disseminating information regarding this Journal using the University website and Bulletin.

I thank the Editorial Board for their good work and for ensuring that articles are published Twice in a year (January – June; July - December). The efforts of the contributors to this volume are commendable. It is not easy to conduct a research and have it published. The Editorial consultants and Reviewers made their inputs towards improving the work of contributors and I really appreciate their efforts.

Our readers comments, advice, suggestions are welcome for further improvement on the quality of the Journal.

Dr. Audu Rufai

Managing Editor.

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The JIEST is the journal of researches in Information, Education, Science and Technology of the School of Science and Technology Education, Federal University of Technology, Minna. The editorial board of the journal welcomes scholarly and original articles (Theoretical and Empirical) on current issues in the fields of information, education, science and technology that possess national and universal application. In addition, the Journal also publishes scholarly and original articles from allied disciplines that have educational significance and values.

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Proceedings

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TABLE OF CONTENTS

1	Vocational and Entrepreneurship Education: A Panacea for Economic Growth in Nigeria. Mohammed, E. Jonathan, D._Shaluko, Y. D.	1
2	Influence of Selected Variables on Students' Choice of Technical and Vocational Teacher Education in Plateau State, Nigeria. Labe, B. I. & Gimba, J.	10
3	Information and Communication Technology Facilities and Competencies Required by Technical Drawing Teachers for Effective Teaching of Technical Drawing in Secondary Schools. Arc. Opasina, S. A.	23
4	Effects of Computer Assisted Instruction with Animation on Interest of Secondary School Physics Students in Minna Metropolis, Niger State. Mohammed, N. J.; Abdulkadir, S.; Zubairu, D. M. & Ndako, U. Z.	29
5	Entrepreneurial Skills Required by Science and Technology Undergraduate Students for Establishing Technology Based Entrepreneurship Ventures. Alhassan, Y. A., Amina, D., Sussan, Z., Ganako, M. A. & Abdurahman, S.	36
6	Influence of Family Factors on Academic Achievements among Niger State Senior Secondary School Chemistry Students. Nagenu, S. U. & Wushishi, D. I.	46
7	Influence of Social Media on Masters Students Learning Activities. Tsado Leah Yebo	53
8	Challenges of Conflict in Construction Industries in Minna Metropolis. Kagara, A. B., Saheed H. A, Udu, L. & Adogo, S. G.	63
9	Effects of Educational Robotics on Students' Achievement in Basic Science and Technology among Junior Secondary School Students in Niger State. Usman, G. A.; Sani, M. M.; Abubakar, M. K.; Kawu, H. U. & Ogunmilade, J. O.	72
10	Purpose of Utilization of Health Information Resources by Medical Doctors in Niger State Hospitals. Shekarau, M. I.; Abubakar, F. & M. Hussaini	83
11	Assessment of Community Participation in Environmental Sanitation among the Residents of Rafin-Dadi, Katsina Metropolis. Nuhu, U.; Rukkaya, L. M.; Auwalu J. & Asiya A.A.	92
12	Effects of Jigsaw and Group Investigation Methods on Students' Achievement and Retention in Basic Electricity in Niger State. Yisa, S. N. & Lewu, M. O.	107
13	Effects of Basic Podcast and Vodcast Methods on Students' Achievement and Ability in General Woodwork in Technical Colleges in FCT, Abuja, Nigeria. Musa, S.; Kareem, W. B. & S. A. Owodunni.	119
14	Technical and Vocational Education and Training: A Panacea for Economic Resuscitation in a Dwindling Economy of Nigeria. Ukoha, U. A., Labe, I. B. & Upwa, F. E.	129
15	Assessment of National Project Health and Safety Plan Template Compliance by Building Construction Industries in Abuja Metropolis. Mohammed, U.K. ,Igwe, C. O. & Kareem, B . W.	140

16 Development and Validation of Task Identification Instrument for Assessing Practical in Plumbing and Pipe Fittings in Technical Colleges in North Central Nigeria. **Agada, A. M., Yaduma, P. S., Enemali, J. D. & Mshelia, A. M.** 148

17 Mathematical Simulation of HIV/AIDS Transmission Dynamics Incorporating Drugs Resistant Compartment. **Ale, S.; Cole, A.T.; Abdulrahman, S. ; Ineke, J. & Zakari, Y.** 159

18 The Effect of Polyethylene Colour Mulch on the Growth and Yield of Three Accessions of Gongronema *Latifolia* in Southeast of Nigeria. **Ahmed Sunday** 171

19 Challenges to Entrepreneurship Skills Development Inhibiting Self Reliance in Automobile Mechanics Occupations in Nigeria. **Abutu, F., Mohammed, M. Aminu and Abdulmalik, S. O.** 187

20 Computer Familiarity and Academic Achievement in Introduction to Ecology Computer-Based Test of Year One Undergraduate Science Students in Federal University of Technology Minna. **Idris, U. S. B.; Hamman, M. J. & Mukhtar, S.** 198

EFFECTS OF BASIC PODCAST AND VODCAST METHODS ON STUDENTS' ACHIEVEMENT AND ABILITY IN GENERAL WOODWORK IN TECHNICAL COLLEGES IN FCT, ABUJA, NIGERIA

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Abstract

The study sought to determine the effects of basic podcast and vodcast methods on Students' Academic Achievement and Ability Level in General woodwork in Technical Colleges in Federal Capital Territory, Abuja, Nigeria. 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 FCT. Abuja, Nigeria. The population of this study comprised of the entire 126 year two NTC II general woodwork students in all the Technical Colleges in the study area. A simple random sampling technique was used to sample two technical colleges out of the three technical colleges in FCT. The instruments used for data collection was General woodwork Achievement Tests (GWWAT). 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 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 analyze the data and test the hypotheses. The study found out that, vodcast teaching technique had positive effect on the academic achievement of high, medium and low ability level of students in general woodwork. The study recommended among others that general woodwork teacher should adopt the use of vodcast teaching technique to enhance students' academic achievement and ability level.

Keywords: Technical colleges, General woodwork, Podcast, Achievement and Ability Level

Introduction

Technical colleges are institutions designed to prepare the individual (learner) with scientific knowledge and skills leading to gainful employment. The Nigeria Technical Colleges are educational institutions established with the aim of training students to acquire appropriate vocational skills, knowledge, attitudes, habits of thoughts and qualities in character that will enable them to develop their intellectual, social, physical, emotional and economic capabilities to become self-reliant and contribute to National economic growth and development (Okolie, Elom, Osuji & Igwe, 2019). In order to ensure that the aim and objectives of establishing technical colleges and vocational training centres are fully achieved, the Federal Government of Nigeria in 1977 set up National Board for Technical Education (NBTE) to coordinate the activities of both technical and vocational training centres by setting standards for the schools in terms of facilities, teaching manpower and accreditation of courses and to guarantee that both technical and Vocational Schools fit in with the State Policy on the set down requirements and standards. The courses offered at these technical colleges and vocational training centres includes general subjects such as mathematics, English languages, social studies, civic

education, basic science and religion studies. While trade areas include: Motor Vehicle Mechanics, Blocklaying and Concreting, Computer Craft Studies and woodwork trades (NBTE, 2012).

General woodwork is one of the trades offered in technical and vocational education. It prepares the learner with knowledge and skills in the art and craft of woodworking and further equips the individual with the necessary skills for self-enterprising and as skilled craftsmen in the wood-base industries. General woodwork is the activity or skill of making items from wood, and includes cabinet making, woodturning, carpentry, joinery and woodcarving. According to Okwori, *et al.* (2013) the skill areas of General woodwork curriculum includes carpentry and joinery, upholstery, wood machining and furniture making.

The persistent poor academic achievement as well as the retention in General woodwork and other technical subjects are as a result of the inappropriate teaching method adopted by teachers (Ogbuanya & Owodunni 2013). These means that for good quality teaching and learning at technical colleges, the use of appropriate instructional method of teaching like information and communication technology (ICT) that will increase students achievement, ability level, involvement and commitment in learning should be adopted. Thus, the teachers can make their teaching more attractive and lively by using ICT gargets that are rich in learning materials in the form of digital textual, pictures, screencast, projector, charts, models, video and podcast.

Podcast is a digital media file or services of file that is distributed over the internet using syndication feeds for play back on portable media players and personal computer. However, Fernandez *et al.*, (2009) identify three types of podcast to includes; Basic podcast, enhanced podcast and vodcast. Basic podcast contains only audio content and is the easiest to create and listen to, an enhanced podcast has both audio and video slides. The enhanced podcast is in the form of traditional podcast. It contains multimedia information such as slides, pictures, images, photographs short video and chapter that help users to increase their perception about the topics, it is a slide of the learning content with audio and the third one is the vodcast (or video podcast) which contains both video and audio files. The choice of podcast by the teacher is influenced by the strategy employed and the learning content to be supplied to the students. However, this study will be limited to two types of podcast which are basic podcast and vodcast. Kay (2012) opined that Students learn by investigating, collaborating, researching, and eventually developing academic-based video podcasts if they are involved in planning and creating their own video podcasts. Thus, it may be used to improve students' academic achievement.

Academic achievement is the measurement of the effect of specific programme of instruction. Ogbuanya and Owodunni (2013) described academic achievement as a performance in school subject as symbolized by score on an achievement test. Academic achievement can be referred to the quality of knowledge acquired and retained by the students in the course of study. Students are achieving when they acquired the required knowledge that will prepare them for the field of work and for further studies. DeFrancesco (2015) asserted that academic achievement depends on several factors such as instructional methods, learning environment and the learner. Student's level of academic achievement is usually influenced by many factors such as students' readiness, instructional method, personality and ability level.

Ability enables students to understand and transfer understanding from one situation to another. Ability level is the characteristic mode of functioning that a student exhibits in intellectual activities in a highly consistent and persuasive way (Charles, *et al*, 2017). Ability level influences the rate, quantity and quality of learning. It also affects how students transfer and retain what they have learnt in classrooms (Ezeugwu, *et al.*, 2016). The teaching and learning of woodwork trade at the technical college should take care of both the low, medium and high ability students. Iji and Herbor-peters (2015) stated that instructional practices in the classroom in Nigerian school, seems to favour only the students with high ability. Abakpa and Iji (2011) assert that with the traditional method of teaching, the gap between the achievements of high and low ability students continue to widen. Thus there is need to explore approaches that will improve students achievement at all levels, these form the bases to verify how basic podcast and vodcast instructional methods can enhance student's ability and achievement in general woodwork trade.

Statement of the Problem

General woodwork students upon graduation are expected to possess skills among others in machines, carpentry and joinery, furniture making and upholstery, as well as having the ability to operate machines to operate woodwork workshop, maintain and repair household furniture's among others (Oviawe, 2021). It is hoped that these skills will boost their chances at enterprise and self-reliance. The realization of this objective rests hugely on the quality and strategies of instruction they receive from the teacher. However, Umar (2014) observed that general woodwork students of technical colleges lack necessary knowledge and skills required for employment.

As a woodwork teacher, observations and interactions with students in technical colleges in FCT Abuja has shown that the majority of students do not possess the required skills to start-up an enterprise or to be employed as skill craftsmen in the industry due to their inability to mark and construct simple woodwork joints, these caught the attention of the researcher. The implication of this is that students may not have been provided with the necessary skills as a result of inappropriate method of instruction, instructional materials and inability of the teacher to effectively implement the curriculum. Igwe and Ikalule (2011) attributed poor academic performance of students in general woodwork to deficiency in teaching methods used by the teacher probably due to nonuse of innovative methods that are problem solving oriented such as guided discovery, critical thinking, problem solving among others.

However, the use of basic podcast and vodcast instructional methods is purported to have the potential of enhancing students learning in biology (Bimpe,*et al*,2016). It is hoped that the use of basic podcast and vodcast may also increase the teaching and learning of general woodwork, Therefore, the problem of the study is put in question form: What is the effect of basic podcast and vodcast instructional method on student's achievement and ability in general woodwork in technical colleges in FCT Abuja.

Aim and Objectives of the Study

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

1. The effect of basic podcast and vodcast instructional methods on students achievement in general woodwork in technical colleges in FCT Abuja.

2. The effect of high, medium and low ability level students 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

1. What is the effect of basic podcast and vodcast instructional methods on student's achievement in General woodwork in technical colleges in FCT Abuja?
2. 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

HO₁: There will be no significant difference between the mean scores on students' achievement when taught general woodwork using basic podcast and vodcast instructional methods.

HO₂: There will be 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 126year two (NTC II) students of General woodwork for 2019/2021 academic session in the three technical colleges in FCT. Abuja offering General woodwork. A simple random sampling technique was used to sample two technical colleges out the three technical colleges in FCT Abuja. This includes Federal Science and Technical College, Orozo72 andGovernment 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 Tests (GWWAT). The GWWAT was subjected to face and content validation by three experts. The reliability co-efficient of GWWAT 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 GWWAT to ensure that, each item in the test is standardized. The study was conducted in 7 weeks' period during which, 5 topics in general woodwork was covered. The study involved three stages which include: administration of pre-test, treatment and posttest 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.

The collection of data for the study was achieved through physical administration of the GWWAT to all NTC II general woodwork students to determine their achievements 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) IBM version 23, was used for the data analysis.

Results:

Research Question 1

What is the effect of basic podcast and vodcast instructional methods on student's achievement in General woodwork in technical colleges? The data analysis for research question one is shown in Table 1.

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

Groups	Pretest			Posttest			Mean Gain
	N	Mean	SD	Mean	SD		
A (Basic Podcast)	71	26.53	97.29	57.27	16.55	30.74	
B (Vodcast)	54	27.23	99.34	59.42	61.53	34.30	

Table 1 show that the pre-test of the basic podcast group mean achievement score is 26.53 with standard deviation of 97.29 while a mean score of 57.27 was obtained in the post-test with standard deviation of 16.55. However, the pre-test, post-test mean gain of basic podcast group was 30.74. The pre-test mean score of the vodcast method is 27.23 with standard deviation of 99.34 and a post-test mean of 59.42 with standard deviation of 61.53 while its pre-test, post-test mean gain is 34.30. It is revealed that vodcast group mean achievement score is greater than the mean achievement score of the students in the group of basic podcast method. Therefore, vodcast instructional method is more effective than the basic podcast in improving the achievement of students 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	38.77	3.46	76.86	6.40	38.09	3	41.67	1.57	93.67	5.13	52.00
Medium	57	26.33	2.70	57.79	7.05	31.46	6	27.67	2.07	65.17	3.25	37.50
Low	26	12.85	4.39	33.50	4.45	20.65	4	15.75	1.26	37.00	1.41	21.25

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 38.77 with standard deviation of 3.46 and posttest score of 76.86 with standard deviation of 6.40, medium pre-test mean score 26.33 with standard deviation of 2.70 and posttest score of 57.79 with standard deviation of 7.05 and low has pre-test mean achievement scores 12.85 with standard deviation of 4.39 and posttest score of 33.50 with standard deviation 4.45. The mean gained between the ability level of pre-test and post-test of basic podcast group was 90.02. The high, medium and low ability students taught general woodwork with vodcast method had pre-test mean achievement score of high 41.67 with standard deviation of 1.57 and posttest score of 93.67 with standard deviation of 5.13, medium pre-test mean score 27.67 with standard deviation of 2.07 and posttest score of 65.17 with standard deviation 3.25 and low had pre-test mean achievement of 15.75 with standard deviation of 1.26 and posttest score of 37.00 with standard deviation 1.41. The mean gained between the pre-test and posttest of the vodcast group was 110.88. This indicated that, students taught general woodwork using vodcast instructional method had higher mean achievement scores than students taught using basic podcast instructional method.

Hypotheses 1

H_0 ₁: There is no significant difference between the mean achievement scores of General Woodwork students taught using Basic Podcast Instructional Method and those taught using Vodcast Instructional Method. The data analysis for Hypotheses one is shown in Table 3

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

Source	Type III Sum of Squares		df	Mean Square	F	Sig.
Corrected Model	29085.174 ^a		2	14542.587	233.287	.000
Intercept	4014.623		1	4014.623	64.401	.000
Pre-test	28691.427		1	28691.427	460.258	.000
Group	259.558		1	259.558	4.164	.043
Error	7667.532		123	62.338		
Total	458647.000		126			
Corrected Total	36752.706		125			

a. R Squared = .791 (Adjusted R Squared = .788)

Table 3 revealed the F-calculated values for mean scores of basic podcast and vodcast instructional method on the achievement test of GWW. The result revealed that the F-calculated value for Group is 4.164 with p-value of 0.043 is less than .05. Therefore, the null hypothesis is rejected. With this result, there is significant difference in the mean achievement scores of GWW students taught using Basic podcast instructional Method and those taught with Vodcast instructional Method.

Hypotheses 4

Ho₄: There will be no significance difference between the mean scores of high, medium and low ability level student's achievement 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 achievement Scores of High, Medium and Low ability students taught general woodwork using basic podcast and vodcast instructional method

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	31209.419 ^a	3	10403.140	228.959	.000
Intercept	4437.011	1	4437.011	97.652	.000
Pre-test	143.304	1	143.304	3.154	.078
Ability level	2383.803	2	1191.902	26.232	.000
Error	5543.287	122	45.437		
Total	458647.000	126			
Corrected Total	36752.706	125			

a. R Squared = .849 (Adjusted R Squared = .845)

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 26.232 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.

Discussion of Findings

The findings on the effect of Basic podcast and vodcast instructional method on students' achievement scores in general woodwork shows that the mean achievement in the vodcast group is higher than the Basic podcast group. This implies that students in the vodcast group had a higher mean gain compared to their counterparts in the basic podcast group after treatment. The finding supported the results of Lowman (2014) who reported that exposing students to vodcast teaching method increases students' achievement than basic podcast method. Stajka (2013) stresses that basic podcast and vodcast methods significantly improved students' academic achievement than traditional teaching method. In the same way the finding of this study confirmed the findings of Rasi and Poikela (2016) who discovered that students taught using vodcast are involved in solving problems that help to promote their thinking capacity, increase their understanding of the content and give opportunity for better application of the knowledge compared to the students' taught using conventional teaching methods. The possible reason behind the improvement of vodcast method over basic podcast method is as a result of the strategy that helps each student to view and listen to the content repeatedly to be able to master the task.

Furthermore, findings on the test for significance difference among the achievement scores of students taught basic podcast and vodcast instructional methods revealed that there was no significant difference between the mean score of basic podcast and vodcast groups in the achievement of students in general woodwork. The findings of the study agree with the study conducted by Nwachukwu *et al.* (2019) which revealed that vodcast and podcast increase productivity, promote creativity and facilitate academic learning. Basic podcast and vodcast methods are independent and collaborative learning methods which have almost similar treatment. This implies that the two methods were significantly effective on the students' achievement in teaching and learning of GWW. When students centred method is used in teaching GWW students are actively involved in teaching and learning process in and outside the classroom.

The results presented on the effect of ability level of high, medium and low students' achievement when taught general woodwork using basic podcast and vodcast teaching methods revealed that there were significant differences among the performances of high, medium, and low ability students taught with basic podcast and vodcast teaching methods. Both high, medium and low ability student's performed significantly better when exposed to basic podcast and vodcast teaching methods after their pre-test and post-test were compared. The findings of this study agree with the findings of Abakpa and Iji (2011) who opined that there is a positive correlation between good teaching approach and students' achievement at all ability levels in mathematics. Similarly, this study is in agreement with the study of Adeyemo (2010) whose findings showed that students' ability have significant influence on problem-solving task. In this study, Basic podcast and vodcast methods are suitable for teaching general woodwork in technical colleges to improve academic achievement of high, medium and low ability students' but vodcast is more effective.

Conclusion

Based on the findings of the study on the effects of basic podcast and vodcast methods on Students' Academic Achievement and Ability Level in General woodwork. The result of the study revealed that basic podcast and vodcast are both suitable teaching methods that can be used to improve students' academic achievement and ability level. The study further revealed that vodcast teaching method is more effective in enhancing students' academic achievement and ability level of knowledge in general woodwork than basic podcast method. It is concluded that basic podcast and vodcast methods have the ability to improve students' involvement in teaching and learning activities inside and outside the classroom. Also, the study has provided general woodwork teachers with a teaching lesson plan that can be used or adapted to teach general woodwork module using basic podcast and vodcast instructional methods, as one of the contributions to knowledge.

Recommendations

1. General woodwork teachers should adopt vodcast instructional method to teach students at technical colleges to enhance student's academic achievements and retention in general woodwork.
2. Regular workshop and seminar should be organized for general woodwork teachers by Federal and State Ministries of Education on the needs for woodwork teachers to use vodcast for instruction.

3. Federal Ministry of Education and curriculum developers should incorporate podcast instructional method in their future curriculum design for enhanced students" academic achievement and retention in general woodwork.

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