EFFECTS OF BASIC PODCAST AND VODCAST METHODS ON STUDENTS LEARNING OUTCOME INGENERAL WOODWORK IN TECHNICAL COLLEGES IN FCT, ABUJA, NIGERIA

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ABSTRACT

The study was carried out to determine the effects of basic podcast and vodcast methodson Students learning outcome in General woodwork in Technical Colleges in FCT, Abuja, Nigeria. Six research questions and six research hypotheses guided the study. The study adopts quasi-experimental and Factorial research design. The population for this study comprised 126NTC II students offering general woodwork trade subject in technical colleges in FCT, Abuja. The instruments for data collection were: General woodwork Achievement and Retention Tests (GWWART) and General woodwork Interest Inventory (GWWII). The GWWART and GWWII were subjected to face and content validation by three experts from Industrial and Technology Education Department, Federal University of Technology, Minna. The reliability coefficient of GWWART was obtained to be 0.78 using Kuder Richardson 20 (K-R20) while that of GWWII was 0.85 through Cronbach Alpha statistics. Mean and standard deviation were used to answer the research questions, while Analysis of Covariance (ANCOVA) was employed to test the null hypothesis formulated for the study at 0.05 level of significance.The findings revealed that the two instructional methods (basic podcast and vodcast) significantly increase academic achievement with meanscores of ($X_{1=}$57.27 X_2=59.42).Interest(X_1=41.59, X_2=43.54). Retention(X_1=59.42,X_2=60.15) and ability level of students learninghigh (X_2 =76.86, X_2=93.67), medium (X_1=57.79, X_2=65.17) and low ($X_1$33.50, X_2=37.00) but the group taught with vodcast has the highest performance followed by basic podcast method. The result of the hypotheses tested revealed that there was significant difference in the mean achievement scoresof students taught using basic podcast and vodcast method $F_{(4.164),}$ = 0.43, p< 0.05. Significance difference was observed in mean interest scoresof students taught using basic podcast and vodcast method $F_{(5.779),}$ = 0.018, p< 0.05. NoSignificance difference in mean retention scores of students taught using basic podcast and vodcast method $F_{(13.317),}$ = 0.000, p< 0.05. and there was Significance difference in mean ability scores of thestudentstaught using basic podcast and vodcast method $F_{(26.232),}$ = 0.000, p< 0.05. Based on the findings, the study therefore recommended that attention should be given to multimedia instructional methods that are student's centred learning such as basic podcast and vodcast teaching methods in teaching vocational and technical subjects and trades such as general woodwork in Nigeria technical colleges.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

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 becomes self-reliant and contribute to National economic growth and development (Okolie, *et al.,* 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).

NBTE as regulatory agency has major mission of providing enabling environment where proper quality information and aptitudes in Science, Technical and Vocational Education would be procured for academic and important living. The Board was empowered to coordinate the activities of both technical and vocational training centres by setting standards for these 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 language, 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 National Board for Technical Education (NBTE, 2020). In addition to these trade areas are the subject related trades; General metal work, Pipe fittings and plunbing work, general woodwork etc.

General woodwork is one of the subject related trade in technical and vocational education. According to Oviawe (2021) it is a skill-oriented subject related trade offered in technical colleges in Nigeria. 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, joinery, woodcarving and carpentry. According to Okwori, *et al*. (2019) the skill areas of general woodwork technology includes carpentry and joinery, upholstery, wood machining and furniture making.

The combination of furniture making, machining, upholstery and cabinet making are offered in technical colleges as General woodwork. It is design to provide the students with general knowledge and skills in woodwork aiming at preparing the individual for self- enterprising. Okwori (2018) viewed woodwork as the experiences given to students in technical Colleges to promote a deliberate sustainable development and poverty reduction. It is an intervention plan to bring about learning which could make the students more productive in areas of economic sector, occupational and specific work. This is in line with aim of establishing the technical colleges. At the completion of the training programme from these technical colleges, especially in the field of general woodwork an individual is expected to become expert in both industrial and domestic construction work, work in industries, and also be able to carry out construction and maintenance of new and existing work in houses, offices and its associated environment among others (Oviawe, 2021).

Understanding the aim of Federal Government of Nigeria in preparing the individual for useful living and for further studies in higher education, General woodwork students are still lacking the required knowledge and competencies to perform the expected roles in

the General woodwork workshop due to their inability to mark out and construct simple woodwork joint, interpret drawing and proper use of hand tools (Oviawe, 2021). However, 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, 2018). 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, retention, interest, ability level, involvement and commitment in learning should be adopted, as this may enhance the cognitive or intellectual abilities of the students towards the acquisition of appropriate work skills, abilities and competences for the individual to live and contribute to the development of the society.

The use of Information and Communication Technology (ICT) can be used to enhance student's cognitive or intellectual abilities in General woodwork. ICT has become an important part of most educational organization all over the world (Ikwuka & Adigwe, 2017). According to Wertlen (2020), ICT is a general term that describes any technology that helps to produce, manipulate, store, communicate and or disseminate information. ICT can be used as tool to enhance teaching and learning process that will bring about change in the growth and socio-economics development of the nation. Ratheeswari, (2018) view ICT as videos, Television, Multimedia and Computer software which combines text, sound and colourful moving images used to provide challenging and authentic contents that will engage students in the learning process. 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. According to Stajka (2018) podcast is an audio or visual contents that are automatically delivered over a network via free subscription. Once subscribe to podcast can be regularly distributed over the internet or within the schools network and accessed with an internet portable open database (IPod), any media player (MP3), laptop, or desktop computer. Podcast includes audio, portable document format (PDF) and electronic publication (E-pubfiles) which can be subscribed to and subscribers are able to listen and spread the episodes to any type of media players (Ramli, 2021). Podcasting allow the user's to download multimedia files which include audio and video at any convenient time easily and play back on mobile devices. However, Badmos (2019) identified 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 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 influence 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.

Basic podcast contains audio files with instructor's voice delivered over the internet for students to download and study at their convenience. Basic podcast is a term used for audio broadcasting it contains audio lesson with instructor's voice narrating or explaining the contents of the lesson that is expected to be achieved (Cheta &

Eberechukwu, 2018). It is a trending form of voice media that is spread outside of entertainment. Popova, *et al.,* (2019) asserted that basic podcasts are rooted not only in radio tradition, but also in the tradition of using audio for teaching and learning. The author further assued that previously research has demonstrated that audio has educational ability to influence cognition through clarity of instructions, and to influence emotional aspects of learning by conveying immediacy and a connection with the teacher. This however differs from vodcast.

Vodcasts refer to video files that are distributed in a digital format through the internet using personal computers or mobile devices. Vodcasts contained videoed lessons with instructors' demonstrations, voice and other visual elements that can boost learners' understanding of a particular lesson (Cheta & Eberechukwu, 2018). vodcast instructional method is a student centred method of teaching employed where the teacher record his lesson contents in video form and distribute it over the internet for the students to downloads and study independently at anytime and anywhere or by interacting with other students. Kay (2021) 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 (2018) see 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 (2020) asserted that academic achievement depends on several factors such as instructional methods, learning environment and the learner. Kpolovie, *et al.* (2019) posited that Academic achievement of students may partly depend on the kind of attitude they put towards school and the level of success they wish to attain. However, students' academic achievement is measured by their ability to retain the acquired knowledge as poor academic achievement of students in general woodwork could be attributed to poor retention ability.

Retention is the ability to remember learnt concept and be able to reproduce what has been learnt in the past. Chinwendu and Nnoduka (2020) explained that retention is the measure of the length of time a student can remember the content he or she was exposed to in a particular course. Students tend to retain what was learnt only when they are actively involved in the lesson and if enough and rich learning experiences are provided. (Zeynep & Mine, 2018). Thus, the use of appropriate instructional method is identified by researchers to be one of the means through which retention can be facilitated by engaging the students in active learning. Ugwu, *et al.* (2020) found that the level of retention is mostly determined by the teaching strategy used in teaching and learning. According to Kennedy *et al.* (2022) academic achievement of students in woodwork could depend on the teaching methodology and motivating factor (either intrinsic or extrinsic), ability and interest.

Interest is an important factor in learning. According to Ogbuanya and Owodunni (2018) it is viewed as the feeling that an individual has when he or she wants to know or learn more about something. This means that the student is bound to pay attention in that particular lesson. Eze (2019) maintained that interest comes as a result or eagerness of curiosity to learn not by force. Interest is an important variable in learning because if

a student has positive interest towards a particular subject he or she will not only enjoy studying the subject but would also derive satisfaction from the knowledge of the subject. Interest is fundamental in any individual's choice task. It consists of feelings and tendencies towards concrete matter. A characteristic feature of interest is a manifestation of a different preference toward actions, events or plans. A student's interest in academic achievement will induce him to behave and act in a certain way towards his studies (Ogbuanya & Owodunni, 2018). This can be related to students' interest, reactions, impressions and feelings the student has in GWWT and its related tasks most especially in topics like machine tools, wood finishes and finishing, timber preparation, wood fittings and among others which students performs below expectation in their exams and even their final examinations. This therefore, implies that interest is also an important factor that can affect students' performance. Bimpe, *et al*. (2016) argued that basic podcast and vodcast instructional method can enhance student academic achievement, interest, retention and ability level.

Ability level 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*., 2021). The teaching and learning of wood work trade at the technical college should take care of both, the low, medium and high ability students. Iji and Herbor-peters (2018) stated that instructional practices in the classroom in Nigerian schools, seems to favour only the students with high ability. Abakpa and Iji (2019) asserted 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.

There is positive correlation between good teaching approach and students' achievement at all levels (Abakpa & Iji 2019). Iji and Harbor-peters (2018) stated that instruction can be organised in such a way and manner that all students in the class can achieve at a high level. According to Adegoke (2020) only the high ability students benefit from the conventional method of teaching he suggested that during teaching and learning the ability level of the students should always be put into considerations. Udofia (2017) observed that students' ability level is a significant factor in their academic achievement with the high-level students benefitting more from particular teaching methods than their low ability counterparts in general woodwork trade. Therefore, there is need for innovative instructional methods that can provide equal achievement opportunity for science, technology and general woodwork students in particular. However, the contradictive evidence in academic achievement due to student's ability level has resulted into the need to verify how basic podcast and vodcast instructional methods can enhance the student's achievement, interest and retention in general woodwork trade. Therefore, what are the effects of basic podcast and vodcast methods on students learning outcomes in general woodwork in technical colleges in Abuja Nigeria.

1.2 Statement of the Research Problem

General woodwork trade offered in technical colleges aim at producing skilled craftsmen who will be self-reliant or employed for pay in ministries, parastatal and industries. The Federal Government of Nigeria (FRN, 2014) outline the aim of technical

college after completion of the programme to include; to secure employment at the end of the whole course or after the completion of one module of employment, to setup their own business and become self-employed and be able to employed others and pursue further studies in higher institution. 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 (2018) observed that general woodwork students of technical colleges lack necessary knowledge and practical skills require for employment despite its importance in developing labour skill and human resources for technological advancement.

As a woodwork teacher, observations and interactions with students in technical colleges in Abuja has shown the possibility of student not having the required skills to start-up an enterprise or to be employed as a skill craftsmen in the industry due to their in ability to mark and construct simple woodwork joints, these caught the attention of the researcher. The implication of this is that students were not 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 (2021) 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 has been 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 instructional method may also enhance the learning of general woodwork in technical colleges, 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, interest, retention and ability level in general woodwork in technical colleges in Abuja, Nigeria?

1.3 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 student's achievement, retention and ability level in technical colleges Abuja, Nigeria. Specifically, the study sought to determine;

1. The effect of basic podcast and vodcast methods on student achievement in general woodwork in technical colleges in Abuja, Nigeria.
2. The effect of basic podcast and vodcast methods on student interest in general woodwork in technical colleges in Abuja, Nigeria.
3. The effect of basic podcast and vodcast methods on student retention in general woodwork in technical colleges in Abuja, Nigeria.
4. The effect of high, medium and low ability level student's achievement in general woodwork when taught using basic podcast and vodcast methods in technical colleges in Abuja, Nigeria.
5. The effect of high, Medium and low ability level student's interest in general woodwork when taught using basic podcast and vodcast methods in technical colleges in Abuja, Nigeria .

6. The effect of high, medium andlow ability level student's retention in general woodwork when taught using basic podcast and vodcast methods in technical colleges in Abuja, Nigeria.

1.4 Significance of the Study

The findings of the study shall be of enormous benefit to the students, general woodwork teachers in technical colleges, federal and state ministry of education, Government, National Board for Technical Education (NBTE) curriculum planners, examination bodies, industries and the society.

The finding of this study is expected to be of great benefit to the students by arousing their interest in the subject area and encourage their class participation. The findings of the study is also hoped to promote students reading habit by listening and watching the recorded learning material on their devices. The findings of the study will also help the students in creating their own content including question, discussion, presentation or project which can be made available for their class mates, this will encourage the students to engage in the materials. The finding is also expected to be an added advantage to the students who misses the lesson to download the materials and listen or watch to complement the lessons missed.

The findings of the study will be beneficial to the general woodwork teachers by developing their skills on the instructional methods and presenting their lesson with ease to the students without stress. The finding of the study is also expected to assist the general woodwork teachers in keeping record of their lessons. Recorded lesson can help the teachers to cover any given topic in the best way possible especially when the teacher teaches multiple class of the same arm, it helps the teacher to ensure that all the students get the same experience and the same information and the syllabus is covered

uniformly. The finding will also be of great benefit to the general woodwork teachers to make up for any unattended class for any reason by developing the learning material and make it available for the students. The findings will help to solve the problem of bad teaching method and improve learning in general woodwork trade.

The findings of the study will be of beneficial to the federal and state ministries of education by providing them with useful information and seeing to it that the necessary facilities and instructional materials that will promote effective teaching and learning in technical colleges are provided.

The findings of the study will serve as a guide to the educational policy makers and curriculum planners in making decision on integrating basic podcast and vodcast instructional method into the school curriculum and seeing to it that adequate facilities and employment of skilled teachers in the use of instructional media that will promote and facilitate effective teaching and learning are provided.

The findings of the study will help the school administrators (principals and head teachers) in re ordering the priorities, budgeting for instructional materials and monitoring of the technical teachers for effective use, having in mind that student learnt better when they have access to sight instructions. It will also stimulate the school administration to organize workshop and seminar to update the knowledge skills of the teachers for effective use of instructional methods to promote learning.

The findings of the study will guide the National Board for Technical Education (NBTE) to integrate basic podcast and vodcast instructional methods into the school curriculum for effective teaching and learning of technical subjects in technical colleges and to rationalize the financing of Education with the view to make Educational system more adequate and efficient for effective learning.

The findings of the study will equally be of benefit to wood industries in providing the desired skilled craftsmen that will fit into the industry and contribute to the development of the industry. It may also help the industry in training and retraining of their staff.

The findings of the study will also be of great benefit to the society by providing skilled craftsmen who will be self-enterprising and contribute to development of the society. It will help in reducing the number of unemployment and can also reduce the number of social vices in the society.

1.5 Research Questions

The following research question were answered in 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 Abuja, Nigeria?

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

3. What is the effect of basic podcast and vodcast instructional methods on student's retention in General woodwork in technical colleges in Abuja, Nigeria?

4. What is the effect of basic podcast and vodcast instructional methods on high, medium and low ability level student's achievement in General woodwork in technical colleges in Abuja, Nigeria?
5. What is the effect of high, medium and low ability level student's interest in general woodwork when taught using basic podcast and vodcast methods in technical colleges in Abuja, Nigeria?

6. The effect of basic podcast and vodcast methods on high, medium and low ability level student's retention in general woodwork in technical colleges in Abuja, Nigeria?

1.6 Scope of the Study

The study is on the effects of basic podcast and vodcast methods on general woodwork students' learning outcome in technical colleges in Abuja, Nigeria. Specifically, the study covered the following areas in general wood work for year NTC II as contained in NBTE syllabus and National technical certificate programme. The areas are timber preparation, woodwork joints, wood adhesives, wood fittings and wood finishing and finishes because this happens to be the most difficult areas students found difficult. However, non-wood materials, veneering, project design and drawing were not covered in this study simply because the study will entail the use of basic podcast and vodcast for lesson delivery.

1.7 Research Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance

$H_{O1:}$ There is no significant difference between the mean scores on students' achievement when taught general woodwork using basic podcast and vodcast instructional methods.

$H_{O2:}$ There is no significant difference between the mean scores on student's interest when taught general woodwork using basic podcast and vodcast instructional methods.

$H_{O3:}$ There is no significant difference between the mean scores on student retention when taught general woodwork using basic podcast and vodcast instructional methods.

$H_{O4:}$ There is no significant difference in the mean achievement scores of high, medium and low ability levels of student's achievement in general woodwork when taught using basic podcast and vodcast instructional methods.

$H_{O5;}$ There is no significant difference in the mean interest scores of high, medium and low ability levels of students in general woodwork when taught using basic podcast and vodcast instructional methods.

$H_{O6;}$ There is no significant difference in the mean retention scores of high, medium and low ability levels of students in general woodwork when taught using basic podcast and vodcast instructional methods.

CHAPTER TWO

2.0 REVIEW OF RELATED LITERATURE

2.1 Theoretical Framework

2.1.1 Constructivism theory of learning

Constructivism theory of learning was propounded by Piaget (1973) and Vigotsky in (1978). The philosophy behind constructivist learning theory is that human can understand only what they construct themselves. The concept of constructivist theory of learning is that the learner is an important agent in the process of learning and learning should be built on the prior knowledge of the learners so they could understand how to construct new knowledge from authentic experience to support active participation and engage in learning with specific objectives. Constructivism view learning as the active construction of knowledge structure through experience. These is the fact that human search for knowledge and meaning from an interaction between their ideas and experience. Constructivism positioned learning as the realization of understanding through active discovery, dialogue and collaboration. It is concerned with the internalization of knowledge and skills, their integration into the existing structures and the effect of support on their emergence (Mayer & Defreitas, 2004). The author added that effective learning can be applied to different contexts, expressed in new ways including the use of technologies which provides opportunity for reflection, self-paced and independent learning.

Bhattacharjee (2015) view Constructivism as a philosophy of learning founded on the premise that by reflecting on our experience, we construct our own understanding of the world we live in. each person can generates his own rules and mental models which he/his use to make sense of his experiences. He added that learning is the process of

adjusting our mental models to accommodate new experiences. Constructivist learning and teaching process, represent a shift from viewing learners as responding to external stimuli to seeing learners as active in constructing their own knowledge, they assert that social interactions are important in knowledge construction. They added that in constructivist learning process, learners directly develop knowledge by experiencing things and by reflecting on such experiences. Constructivism is a theory of learning that is best understood in terms of how individuals use information, resources and help from others to build and improve their problem solving strategies (Woolfolk, 2019). Constructivist approach of learning and teaching helps the learner to construct knowledge, through interaction with their peers, adults and teachers and more knowledgeable fellows.

This theory is related to this study because podcast is an active reflective process which requires students to bring about prior knowledge to the process. The use of podcast allow students to engage in constructing knowledge and understanding while using their devices, it allow student to create their content and share with their peers and also allow them to interact with their class mates and teachers. Philips (1995) suggest three ways of understanding knowledge acquisition based on constructivist philosophy these include active acquisition of knowledge and understanding; social construction of knowledge and understanding and the creation/recreation of knowledge and understanding. This implies that knowledge and understanding are actively created and recreated within a particular context. Thus the use of basic podcast and vodcast will engage students in active learning, constructing knowledge and understanding when using the technology for educational purpose.

2.1.2 Cognitive Theory of Multimedia Learning

This learning theory was put forword by Mayer in 1989. It was based on the fact that learning occurs when people build mental representations from words and pictures. Cognitive theory of multimedia learning was propounded by Richard Mayer and other cognitive researchers. The cognitive theory of multimedia learning first begins to emerge as a distinct theory at the end of the 1980s when Mayer (1989) introduced the theory as the "model of meaningful learning" and then shortly thereafter as the "cognitive conditions for effective illustrations" (Mayer & Gallini, 1990). The name "cognitive theory of multimedia learning" was first used in Mayer, *et al* (1996), but didn't become the standard name for Mayer's theory until the year 2000 and beyond, after various models of the theory was use over the years but focused on different aspects of the current model, but the underlying assumptions remained the same. Elements such as cognitive processes and mental representations were slowly added and refined until we have the model currently described (Mayer, 2009).

This learning theory explores that people learn more deeply from words and pictures than from words alone, which is referred to as the multimedia principle (Mayer 2005a). According to Mayer (2005b) Multimedia researchers generally define multimedia as the combination of text and pictures; and suggest that multimedia learning occurs when we build mental representations from these words and pictures. The words can be spoken or written, and the pictures can be any form of graphical imagery including illustrations, photos, animation, or video. The main proposition of cognitive theory of multimedia learning is that in order to achieve effective teaching and learning Multimedia instructional design attempts to use cognitive ability of the students to combine words and pictures in ways that learning will be maximize effectively. Cognitive theory believes that students' academic achievement and retention will improve when there is

mutual interaction between students and the mental processing of the information available instead of motivations. Cognitive learning theory states that knowledge is created through a dynamic and evolving relationship between cognitive processes, internal structures and the environment (Piaget, 1926).

The principle behind this theory is that cognitive theory of multimedia learning is based on the idea that learners attempt to build meaningful connections between words and pictures and that they learn more deeply than they could have with words or pictures alone (Mayer, 2009). The cognitive theory of multimedia instruction encourages the learner to build a coherent mental representation from the presented material. The learner's job is to make sense of the presented material as an active participant, ultimately constructing new knowledge. The cognitive theory of multimedia learning address the issue of how to structure multimedia instructional practice and employ more effective cognitive strategies to help the learner learn more efficiently. According to Mayer (1997) the design principles include providing coherent verbal, pictorial information, which will guide the learner to select relevant words and images and reducing the load for single processing channel.

These cognitive theories of multimedia highlight three main assumptions when it comes to learning with multimedia:

1. There are two separate channels (auditory and visual) for processing information (sometimes referred to as Dual-Coding theory);
2. Each channel has a limited (finite) capacity (similar to Sweller's notion of Cognitive Load);
3. Learning is an active process of filtering, selecting, organizing, and integrating information based upon prior knowledge.

Humans can only process a finite amount of information in a channel at a time, and they make sense of incoming information by actively creating mental representations. Mayer also discusses the role of three memory stores: sensory (which receives stimuli and stores it for a very short time), working (where we actively process information to create mental constructs (or 'schema'), and long-term (the repository of all things learned). Mayer's cognitive theory of multimedia learning presents the idea that the brain does not interpret a multimedia presentation of words, pictures, and auditory information in a mutually exclusive fashion; rather, these elements are selected and organized dynamically to produce logical mental constructs. Furthermore, Mayer underscores the importance of learning (based upon the testing of content and demonstrating the successful transfer of knowledge) when new information is integrated with prior knowledge.

The dual channel assumption is based on Paivio's, (1986); Clark & Paivio, (1991) dual coding theory and Baddeley's (1992) model of working memory. The dual channel assumption states that learners have two channels for processing information, pictorial and auditory channels. Information presented is first processed through the auditory or visual channels separately and then concurrently through working memory. The limited capacity (finite) cognitive load theory assumption states that learners are limited in the amount of information that can be processed at one time (Baddeley, 1999; Chandler & Sweller, 1991). The theory states that learners are limited to 3 to 5 bits, or chunks, of information at any given time. When learners exceed their cognitive capacity capabilities for processing information decisions are made where connections can be made using existing knowledge. When too much information is presented a learner may move into cognitive overload thus limiting or preventing information processing (Mayer, 2001). The active learning assumption is that learners are not passive and that

they are actively engaged. This assumption states that meaningful learning is dependent upon active cognitive processes during learning. According to Mayer (2001) in active learning situation a learner select new relevant information for additional processing while simultaneously organizing and integrating new information with existing

This theory is relevant to this study because podcast is a multimedia instructional method that enable the technical teacher to broadcast the learning content to the students inform of audio, video and an enhanced podcast which is the combination of audio and video files. According to Henry (2020) Educators constructing content for virtual learning environments should have working knowledge of the principles of Cognitive Load Theory. They need to be equipped with working knowledge to know how and when to apply differing instructional design to a diverse set of technologies that use multimedia methodologies for instruction. Mayer (2009) defines multimedia instruction as the presentation of material using both words and pictures, with the intention of promoting learning. Mayer and his associates assert that the two channels are not equal and that research indicates that information should be delivered in a manner consistent with the way the mind works. By using cognitive theory and understanding how both channels work, designers can develop content allowing the learner to build meaningful connections using verbal and pictorial representations.

In addition, Podcast is an active learning process that involves the learner in selecting relevant information for creating their own content which include; questions, discussion, presentations or project which can be made available to for their class mates. These allow the students to take control of the aspect of the education and therefore encourage them to engage in the materials. The active learning assumption is that learners are not passive and that they are actively engaged. This assumption states that meaningful

learning is dependent upon active cognitive processes during learning. An active learning situation a learner is selecting new relevant information for additional processing while simultaneously organizing and integrating new information with existing knowledge (Mayer, 2001). The role of the teacher as facilitator and instructor is to prepare an enabling learning environment that will help the learner to gain control of the learning process. Meanwhile using basic podcast and vodcast as an instructional method will encourage the learner to actively engage in the learning process thereby promoting effective conditions that will enhance academic achievement and retention of students. Therefore, this theory is adopted as the most suitable and appropriate for the study because it allows the learner to build meaningful connections using verbal and pictorial representations.

2.2 Conceptual Framework

The conceptual framework for this study is based on basic podcast and vodcast instructional methods.

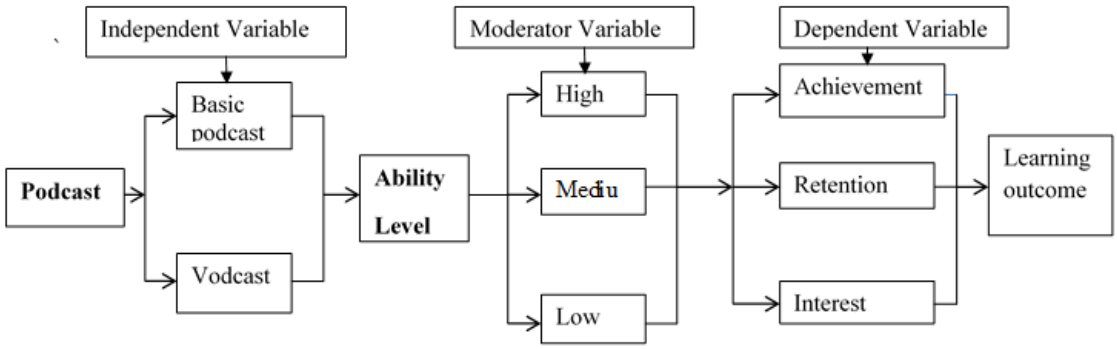

Figure 2.1: The schematic diagram of the conceptual framework by the researcher (2023)

The framework in figure 2.1 Shows General woodwork trade teacher plan his/her lesson and teach the selected topics from general woodwork trade curriculum using basic podcast and vodcast instructional methods to both experimental groups. Abililty level in

the diagram serves as the moderator variable. The most effective method for teaching general woodwork will yield higher students achievement, interest and retention which make up the learning outcome.

2.2.1 Concept of General Woodwork in Technical Education

Technical Vocational Education Training (TVET) is a comprehensive term referring to those aspects of the education process involving, in addition to general education, the study of technologies and related sciences and acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life Federal Republic of Nigeria (FRN, 2014). The Federal Ministry of Education in Nigeria (2012) defined technical education as that aspect of education which leads to the acquisition of practical and applied skills, as well as to basic scientific knowledge. It prepares the learner with occupational competence and those skills that enable one to earn a living and contribute to the development of the society. The importance of technical education cannot be over emphasis it offers much in the area of economic growth and sustainable national development. Technical and vocational College is one of the institutions saddled with the responsibility for training of craftsmen with the required knowledge and skills that lead to occupational competence and economic development of the nation.

Technical colleges (TCs) are educational institutions established with the aims of training and producing technicians for industry (Okolie, *et al.,* 2019). Hassan, *et al.* (2019) stated that technical colleges are established to train craftsmen for industry as well as making individuals to be self-employed and create jobs in the struggle towards technological advancement. They are institution design to prepare the individual (learner) with scientific knowledge and skills leading to gainful employment. Students

admitted into technical colleges spend a period of three years and awarded with National Technical Certificate (NTC) after the completion of the training. Holders of this certificate are grouped as craftsmen (Okwori *et al.,* 2019). Among courses offered in technical college include: Motor vehicle mechanics, Building Construction, Electrical Installation, Metalwork, Plumbing, and General Woodwork. Hassan, *et al.* (2019) opined that the curricula of Technical Colleges are centred on craft/engineering trades and agriculture which includes Agric- Mechanisation, Motor-mechanics, Building Construction, Electrical Installation, Metalwork, Plumbing, and Woodwork among others. The curricula of Technical Colleges focus on crafts, engineering trade, and technical skills. Amongst the available courses in Nigerian Technical Colleges include bricklaying, carpentry, plumbing, painting, automechanic, laboratory, pharmacy technicians, electrical/electronic technicians, skilled vocational nurses, and home economics (Okolie, *et al.*, 2019). In line with these, Okwori, *et al.* (2019) stated that these science and technical colleges run various trade courses which including Metalwork practice, Blocklaying and Concreting, Electrical Installation and Maintenance Practice, painting and decorating and General woodwork.

General woodwork is a practical oriented trade subject offered among technical colleges in Nigeria. It emphasizes learning by doing through cognitive and psychomotor skill (Omeje, 2020). Woodwork as a vocational subject is taught in the comprehensive secondary school as well as in technical colleges, with emphasis geared towards training the students to acquire the appropriate knowledge and the necessary practical skills, in the woodwork trade (Kelani, 2017). It is one of the trade subject of the curriculum of Technical and vocational Education (Omeje, 2020). General woodwork is design to provide the learner with scientific knowledge and practical skills on materials, construction of new and existing projects, maintenance of tool and equipment, machine

operation and ornamentation (Woodcarving) among others That enable one to enter into the world of work and contribute to the development of the society.

Woodwork trade is referred to as activity that involved skills for the production and servicing of wooden articles (Hassan, *et al.*, 2019). General woodwork is the activity or skill of making items from wood, and includes cabinet making, woodturning, joinery, woodcarving and carpentry Federal Republic of Nigeria (FRN, 2014) identifies the component in woodwork technology to include carpentry and joinery, furniture making, upholstery and machine woodworking.

General woodwork craftsmen are expected possess skills and knowledge required to perform in their areas of discipline. They should be able to design and interpret drawing, construct new and carryout maintenance on existing projects, have knowledge of woodworking materials, tools and equipment's and their operations to enable then become employer or employed in the industry. A woodwork graduate of technical college should be capable of independent work; they should interpret technical drawing and perform all the calculations relating to his/her trade. He/she should also have sufficient knowledge of elementary science to understand the materials in which he works with (Okwori, *et al.*, 2019). However, some of the General woodwork graduates do not possess knowledge and skills needed to become an employer or to be employed. Umar (2018) observed that woodwork technology in technical colleges is not yet providing the required knowledge and necessary skills in practical projects as expected from woodwork technology students in technical colleges. These may be as a result of students not provided with the necessary skills, inappropriate method of instruction, instructional facilities and inability of the teacher to effectively implement the curriculum. Study carryout by Dagogo (2019) on technical college graduates

employability skills revealed that technical graduates lack the prerequisite knowledge and skills that will prepare them to the world of work.

However, Okwori *et al.* (2019) posited that training in technical colleges should be geared towards achieving the aims and objectives of the programme which include:-

1. To secure employment at the end of the programme as craftsman.
2. Set up their own businesses and become self-employed and able to employ others.
3. Pursue further education in advanced craft technical programme or in tertiary technical institutions.

2.2.2 Students' Academic Achievement and Retention

Academic achievement of student is the ability of the student to study and remember facts and being able to communicate his knowledge orally or in written form even in an examination condition (Kpolovie, *et al*., 2019). Academic achievement refers to academic knowledge attained by a student in General woodwork modules, which is determined by a score obtained in continuous assessment. Continuous assessment is a mechanism whereby the final grading of a student in cognitive, affective and psychomotor domains of behaviour takes into account, in a systematic way of all the pupil's performances during a given period of schooling, such an assessment involves the use of a great variety of modes of evaluation for the purpose of guiding and improving learning or performance of the students (Ovute, & Ede, 2018). Ezeugwu and Omeje, (2020) defined Continuous Assessment as a process that deliberately allows for periodic assessment of a pupil throughout the course, and which take into consideration the extent to which the goals or targets of learning are being attained. These are done on a cumulative basis so that the performances of a pupil can be judged effectively. Continuous assessment help to determine the level to which academic achievement is

attain by student in a given period of time. Students are achieving when they acquired the required knowledge, skills and attitude that will prepare them for the field of work and for further studies. Student's achievement measures the amount of learning content learnt by the student in a given period of time. Instructional standard are set at each level of education that are expected to be used by the teacher in achieving the learning goals. Teaching is a process that involves bringing about desirable changes in learners so as to achieve specific outcomes. Pooja (2017) sustained that Student achievement will increase when quality of teaching methods are properly used to teach instructional standards.

Many factors are responsible for students' academic achievement. They might include students 'attitude towards school, interest in learning, study habit, attribution, self-efficacy, intelligence, and motivation (Kpolovie, *et al*., 2019). Edoho, *et al* (2020) accredited student's poor academic achievement and retention to the use of inappropriate and ineffective instructional methods. Adunola (2021) link poor academic performance of students to ineffective teaching method by teachers to impact knowledge to learners. Muema, *et al.* (2018) sustained that Substantial research on the effectiveness of teaching methods indicates that the quality of teaching is often reflected by the achievements of learners. However, Academic achievement is an indication of level of retention ability of the students.

Retention is the ability to reproduce the learnt concept when the need arises. Ibrahim, *et al.* (2018) sees retention as the ability of one to remember what he has learned in the later time, it takes place when learning is coded in to memory. It is one thing to be taught using appropriate instructional method; it is another thing to remember it after some reasonable period of time must have elapsed that is retention (Edoho, *et al.*, 2020).

Therefore, retention can be defined as the ability of General woodwork students to be able to keep the knowledge acquired and recall it overtime. Chinwendu and Nnoduka (2020) define academic retention as the measure of the length of time a student can remember the content he or she was exposed to in a particular course. Retention is the primary goal of every Educational setting. It is an important variable in learning because only a learnt experience is recalled, learning cannot be said to have taken place if there is no proper retention. Student academic knowledge retention can be improve through the use of appropriate instructional method.

Many researchers have discussed the different factors that affect student knowledge retention. Obeka (2020) they include the type and content of task to be learned, the amount of original learning, the instructional strategy used, the length of the retention interval and subject individual. Adunola (2021) opined that the poor academic performance by majority of the students in various subject areas is basically linked to the application of ineffective teaching methods by teachers to impact knowledge to learners; therefore, teachers need to be conversant with numerous teaching strategies. However, it is necessary to establish a teaching strategy, which is highly applicable to School education curricula and effective in teaching General woodwork trade in technical colleges, and in which most students are interested. Wushishi, *et al.* (2017) posited that Instructional methods contribute to quality and level of retention in terms of meaningful, concreteness and image evolving characteristic. Basic podcast and vodcast teaching method is capable of producing long-term (retention) learning gains when it is effectively structured by the teacher to engage the students to actively participate. Cognitive benefits of student-created podcasts- enhance understanding of topic, taking a critical stance on topic, connect new to previous knowledge, reflect on implications, independent and active learning is promoted (Phillips, 2018).

2.2.3 Students' Interest in General woodwork

Interest is an important factor in learning, it is viewed as the feeling that an individual has when he or she wants to know or learn more about a skills or trade which woodwork is inclusive. Nwaodo (2020) contended that interest is the attraction, which forces or compels a child to respond to a particular stimulus. In other words, a child develops interest if a particular stimulus (e.g. teaching method or school subject) is attractive and arousing or stimulating. This means that the child is bound to pay attention in that particular lesson. Abdurahaman, *et al.* (2019) maintained that interest comes as a result or eagerness of curiosity to learn not by force. Interest is an important variable in learning because if a student has positive interest towards a particular subject he or she not only enjoys studying the subject but would also derive satisfaction from the knowledge of the subject. Sauer (2018) revealed that students performed better on tasks that piqued their interests, which supports the idea that what the reader brings to the reading experience will influence both the processes and outcomes (goals/strategies used and comprehension/interest).

Interest is perceived in relation to internal state of mind or reactions to external environment or predisposition to experience. Interest may also be viewed as the readiness to react towards or against a situation, person or things in a particular manner with love or hate, fear or resentment to a particular degree or intensity (Abubakar & Danjuma, 2017). They added that interest is that internal state that influences the individual's personal actions. This definition assumes that students' interest in general woodwork implies the reactions, impressions and feelings the student has in WW and its related tasks. Paul (2018) opined that interest can help us think more clearly, understand more deeply, and remember more accurately. Interest has the power to transform

struggling performers, and lift high achievers to a new plane. This therefore, implies that interest is also an important factor that can affect students' performance.

Interest according to Wun, *et al.* (2018) is an activity or a hobby that a person enjoys and spends free time doing or studying. They further defined interest as a social construction developing within the dynamic relationship between the individual and the situation. Abdurahaman, *et al*. (2019) refers interest to mean what an individual likes or dislikes and that they are usually associated with activities. The researcher refers interest to be the positive state of mind or a quality that attract your attention to the learning processes. Interest in a particular subject depends on the affective domain of the learners or students towards that subject. The classification of interest skills according to Wun, *et al.* (2018) are:

- Receiving – Students being aware of or attending to something in the classroom.
- Responding – Showing some new behaviour as a result of experience.
- Valuing – showing some definite involvement or commitment and organization that is, integrating a new value into ones general set of values, giving it some ranking among ones general set of values. Udofia (2017) opined generation of interest as follows:

  - Use of gesture, eye contact and vocal reflection
  - Use of apt examples and analogies can generate interest and understanding.
  - Use of an appropriate mode of explaining. Three modes have been observed the narrative, the anecdotal and the conceptual.

The FRN (2014) gives two affective objectives of Nigerian education. These are the inculcation of national consciousness and National unity and the inculcation of the right

type of values and attitudes for the survival of individual and Nigeria society. Hence, education should lead not only to the acquisition of cognitive knowledge and psychomotor skills but also to the development of appropriate attitudes. Any education that does not promote the right values, attitudes and interest to work, life and society is of limited value. In other words, teaching of appropriate values, attitude and interest should form part of every well organized educational programme. Abubakar and Danjuma, (2017) noted that Tyler classified affective objectives into four broad categories namely: attitudes, interest, value and appreciations. Writing on vocational interest of men and women, Ogbuanya, *et al.* (2018) referred to interest as likes, while dislikes are labeled aversion.

Interest in woodwork can also be an expressed motive that satisfies objectives in vocational education as a field of study. Kpolovie *et al*. (2019) argue that improvement of student's interest in learning and attitude to school could contribute in enhancing their performance academically. According to Udofia (2017), the first systematic efforts to measure interest appeared to have been made in 1915 at the Carnegic institution of technology, where James miner developed a questionnaire to assist students in their vocational choices. A further giant step forward in interest appraisal were taken in 1927 when strong published his first edition of vocational interest Blank (SVIB), and in 1937 when Kuder made available the initial form of the Kuder Performance Record (KPR). The strong inventory was designed to distinguish successful men in given occupational group from men in general. Strong thought that the interest typical of any one occupational group will differ from a people in general group and at least a little from any occupational group. The success and prestige of the SVIB is due to the extensive research involved in its formulation. It has few competitors, hence Kuder adopted a rather scoring approach in the development of his second interest Test- the Kuder

preference Record – occupational. The SVIB require the individual to indicate his preference by marking a phrase D for dislike, I for indifferent and L for like.

Several different methods are employed by psychologist in personality, attitude and interest measurement. Hence, the ones that can be used by the teachers in identifying the changes that are taking place in their students may be grouped into five classes (Abubakar & Danjuma, 2017). These include direct observation, anecdotal record, students self report, questionnaire and inventories, interviews pair rating. The student self reports inventories is the most widely used method for measuring affective behaviour especially in vocational and occupational area. It consists of a typed or printed set of questions to which students are required to respond to. The question might be in form of multiple choice items, through forced items, completion items, check list or rating scales. In filling out the inventory, the students provides information about himself and his likes and dislikes on the basis of which conclusion can be made by the teacher.

2.2.4 Concept of Students Ability Level

The capacity of students to engage themselves meaningfully in any educational task that requires higher cognitive functioning depends on factors which include their academic potentiality and this could be tagged as ability or level of academic attainment (Adeyemo, 2020) Ability level described the capability of individual student's in an intellectual activities in the learning process. According to Adewoye, *et al*. (2019) Students tends to have different ability levels (ability level can also connote level of achievement). Ability grouping simply means the practice of dividing students for instruction on the basis of their perceived capacities for learning. It is the practice of placing students of similar academic ability in the same group for instruction. Adeyemo (2020) identified three ability levels in relation to teaching-learning situation this

include; high, medium and low. High ability level learners are those that prefer isolation and social distance, theoretical and abstract ideas (akin to field independent learners). According to him, high ability individuals are better than medium or low ability group and might be better in other tasks that have to do with the use of hands. In this case, the high ability group has greater ability to structure information and solve problems. Medium ability level learners perform relatively better on learning activities involving social materials, and are more likely to require external defined goals and reinforcements.

In Nigerian schools, the high, medium, and low ability students are lumped in the same class and taught with the same concepts, under the same condition without considering their individual differences (Anyanwu, *et al*., 2021). The teaching and learning of general woodwork at technical colleges should take care of both, the low, medium and high ability students. Iji and Herbor-peters (2018) stated that instructional practices in Nigerian secondary schools, seems to favour only the students with high ability. Abakpa and Iji (2019) assert that with the traditional method of teaching, the gap between the achievements of high and low ability students continue to widen.

However the empirical studies on student's academic achievement due to ability level are still conflicting. Some reported high abilities performed better than medium and low, while some reported otherwise. Report by Yusuf, *et al.* (2018) reported that high ability students performed better than medium and low students when taught chemistry, biology, and physics respectively while Adewoye *et al*. (2019) indicated that there is a significant difference in the ability level of students exposed to collaborative learning method. Thus there is need to explore approaches that will improve students achievement at all levels. Abakpa and Iji (2019) opined that there is a positive

correlation between good teaching approach and students' achievement at all levels in mathematics. Iji and Harbor-peters (2018) stated that instruction can be organised in such a way and manner that all students in the class can achieve at a high level. According to Adegoke (2020) only the high ability students benefit from the conventional method of teaching. Therefore, there is need for innovative instructional methods that can provide equal achievement opportunity for science, technology and general woodwork students in particular. Innovative teaching approach such as podcast instructional methods has been identified as one of the approaches that can enhance effective teaching and learning (Popova, *et al*., 2019).

2.2.5 Podcast

Podcast is a downloadable audio or video file from the internet. Podcast is usually played in electronic devices such as mobile phones, laptops, tablets or mp3 players (Kargozari & Zarinkamar, 2019). Podcast is a digital audio and video broadcast that can be downloaded and played in mobile devices, iPhones, iPods and compter. Podcast is an innovative way of broadcasting through the internet that can be used for transferring digital audio and video content automatically to mobile phones. Podcast is an innovative mobile technology that consists of series video and digital audio broadcast that could be downloaded and played on mobile devices (Abdulrahman, *et al.,* 2018). The term "Podcast" was derived from two technologies, iPod, and Broadcast. Podcast allow listeners to choose, listen and watch their preferred program at convenience.

Podcast was first known in 2004, and it is defined as an internet audio blogging or internet audio publishing. The audio recording is designed to be downloaded and listened to on a portable mp3 player or on a computer. Podcasts are delivered online automatically via a website, so it is different from other audios. Podcasts utilize voice

which is the most influential tool that relates to the audience very quickly. Abdulrahman, *et al*. (2018) opined that Podcasts is an internet audio publishing that is designed to be downloaded and listened to in a portable device such as tabs, Smartphone and laptop. Thus, Podcasts has unique feature different from other audios in terms of its content. Podcasting refers to selecting and receiving podcasts that offer the users the advantage of freely controlling where, and when they listen to audio or video content.

The audio content presents authentic listening source which allows every listeners benefit from it. Podcast can be automatically downloaded via a subscription feed (an automatic downloading process). These allow users to simply listen to the content on their devices, at their convenient time. Thus, podcast is a series of sound files that consist of educational information in a comprehensive manner to make the user an advanced learner, the use of podcast in education enable an online delivery of learning content inform of audio and video that is assess by the leaner to be listen or watch at their convenience and also provide feedback to the teacher. There are three types of podcast which include; basic podcast (audio), enhanced podcast and vodcast podcast (video).

2.2.5.1 Basic Podcast Instructional Method

Basic podcast is a method of distributing digital audio contents over the internet. Basic podcast is a combination of two words, “pod” from Apple’s iPod digital music player and “casting” from broadcasting. According to Centre on Technology and Disability (2020) the history of Basic Podcast is dated back to the 1930s, in the form of radio shows. The term was coined in 2004 by Ben Hammersley in an article published by The Guardian about how the iPod was making the Audible Revolution possible. In the

article, Ben discussed how the Internet had made audio production cheap, or even free. This new boom in amateur radio needed a new name, and Ben suggested audio blogging, podcasting, and Guerilla Media. Basic podcasting is a means of publishing audio content on the web as a series of episodes with a common theme. These episodes are accompanied by a file called a "feed" that allows listeners to subscribe to the series and receive new episodes automatically. Jeremy & Eric (2021) Basic podcast technology is sound broadcastings which are published on the Internet and downloaded to computers automatically. Basic podcast is used for sound files. It is an innovative way for the delivery of audio content that ranges from informational programs, interviews, to music (Fichter, 2017). Basic podcast allow content providers to use a feed to distribute content over a network via free subscription. Once subscribed to, podcasts can be regularly distributed over the Internet or within your school's network and accessed with an iPod, or any portable MP3 player, laptop, or desktop computer.

In an educational context, basic podcasting offers innovative and creative opportunities for academics to further support learning. The use of basic podcast as an instructional method for teaching and learning does not solely depend on the technology, but on the way the learning content are prepared and delivered to the students. Cheta and Eberechukwu (2018) posited that basic podcast can be used to provide introductory material before teaching, or, more commonly, to record learning contents and allow students to listen to the teaching again, either because they were unable to attend, or to reinforce their learning. Moreover podcast can be used for presentations of learning material from the teacher to the student's. Basic podcast can be used to provide instructions for a fieldtrip in which another layer of dialogue and interaction can be achieved. Students are exposed to a location outside the classroom, interact with their environment and maybe with their peers, and get hands-on guidance through basic

podcast. Examples are a field trip, and to prepare students for practical work in a laboratory or workshop. This will provide the student with clear view of the activity they are expected to carry out.

Stajka (2018) highlight three different ways of educational use of basic pod-casts as discuss by Authors to include; unconstitutional use, supplementary use and creative use. At a most basic level basic pod-casting can be used as a substitute to the traditional lecture where students can access an entire recording of the lecture. While there is educational value in providing recordings of lectures for the purposes of revision and review, if used exclusively as a substitute for traditional lectures, such use may further reinforce students as passive recipients of information. Kay (2021) opined that Basic pod-casting can also be used to provide supplementary material to assist learning. Supplementary material can be in two very different forms. The first, and most common form, is their use in providing summaries or syntheses of course material. As well as providing revision and summary material, supplementary material can also be in the form of additional material which may broaden or deepen the student's understanding. The final and least frequently mentioned use of basic pod-casts in education is what could be described as creative use, where students become more engaged in the learning through constructing knowledge rather than simply receiving it.

Students can create their own podcast to share their learning experiences with each other and also with other students from other schools. The student is required to have a deep level of knowledge of the subject matter if they are to successfully construct a suitable basic podcast, and therefore this type of uses challenges the student to critically examine the material they have been exposed to previously. This type of use can also develop students' ICT skills through the creation and manipulation of digital media.

When provided as a group task, other important social skills, such as the student's ability to collaborate and participate effectively in a group, can be developed. According to Med (2021) creating basic podcast allows students to develop skills such as researching, writing, speaking effectively, managing time, grabbing attention, improving their vocabulary and solving problems. When students are involved in solving problems it promotes their thinking capacity, increase their understanding of the content and give opportunity for better application of the knowledge. Creative activities in podcasting encourage student's collaboration and enable then to generate their own contents. Collaborative development of podcasts enables student' conceptualizations of disciplinary content to be shared with peer, stimulating both individual and collective learning, supports social processes of perspective-taking and negotiation of meaning that underpin knowledge creation (Phillips, 2018). The author added that Cognitive benefits of student-created podcasts- enhance understanding of topic, taking a critical stance on topic, connect new to previous knowledge, reflect on implications, independent and active learning is promoted.

Basic podcast instructional method is an essential motivational component that encourages the student's to engage in the learning contents thereby increasing their desire to learn and sustain their interest throughout the course of learning. The use of basic podcasts in education contributes to diversification of the teaching materials that are presented based on the use of text and pictures, which has a positive effect on increasing motivation and encouraging the students' attention and interest in their engagement and learning (Stajka, 2018). In analyzing the benefit of basic podcast in education, Goldman (2018) have it that basic podcasts provide teachers with the ability to grow podcast usage, and new classroom activities to improve a student's learning experience. Students who can use podcasts as a learning resource experience the

benefits of audio learning, experience aspects of podcasting technology and encourages learning outside of the classroom. Audio learning plays an incremental role in learning for young people. For instance, "when words are spoken aloud, children can understand ideas that are two to three grade levels higher than their normal reading level" (FeHennig, 2017). Implementing basic podcasts as part of teacher candidate training courses leads to more prepared teachers. Teacher preparation is an essential part of producing the best possible educators collaborating, researching, and eventually developing academic-based podcasts. Popova, *et al*. (2019) found that basic podcasts help bridge the conceptual distance between new and prior knowledge, better understand topics in lectures and stimulate thinking more deeply about the lecture's content and the possible applications of the subjects of the lecture. Kaplan- Leiserson (2016) identified seven uses of podcasts that can contribute to the learning process to include:

1. Assist auditory learners – basic podcasts are appropriate for learners who prefer to take in information aurally. Some lecturers record their classroom lectures to help audio learners retaining the covered information.
2. Provide another channel for material review - the audio files can be reviewed at leisure time for understanding or before testing. Students considered that listening to the recorded classroom lectures was strength of the course.
3. Assist non-native speakers – it is an opportunity for them to review recordings as many times as necessary for understanding. Basic podcasting can also be an excellent technology for learning a language, and for capturing students' speech and pronunciation.

4. Provide feedback to learners – “a professor’s voice adds to the feedback” pointed out Margaret Maag, an assistant professor that recorded a 3 to 4 minutes feedback on her students’ group presentations.
5. Enable instructors to review training or lectures.
6. Replace full classroom or online sessions when content simply requires delivery – learners may access it whenever and wherever they want.
7. Provide supplementary content or be part of a blended solution. The material may beavailable for access on a voluntary basis, or it may be a required component of a classroom or online course. Stajka (2018) concluded that Podcast implementation in educational process would contribute to achieving the aims and outcomes of education.

2.2.5.2 Concept of Vodcast (Video podcast)

Vodcasts refer to video files that are distributed in a digital format through the Internet using personal computers or mobile devices. According to Nwachokor, *et al.* (2019) Vodcast is a term used for online delivery of video content; this content is for registered students. vodcast (video podcast) are terms used for video broadcastings (Nesrin & Yasemin, 2018) Vodcasting uses the enclosures of Real Simple Syndication (RSS) feeds for distribution of video content that can be downloaded to mobile devices (Nwachokor, *et al* 2019). Vodcast means video on demand (Ronco & Scabardi 2016). Vodcasts contained videoed lessons with instructors’ vodcasts, voice and other visual elements that can boost learners’ understanding of a particular lesson (Cheta & Eberechukwu, 2018). vodcast teaching method is a student centred method of teaching and learning employed where the teacher record his lesson content in video form and distribute it over the internet for the students to downloads and study independently at anytime and anywhere or by interacting with other students. The organized recorded lesson contain

sound and pictures, demonstrated action of the teacher, or step by step procedure of a task that is intended to be achieved at end of the lesson and assignments that will engage the students in the learning process. Learning Times (2019) remarked that organizations' pattern of communication with their clients, employees and constituents are constantly being revolutionized through podcasting.

Educators can then leverage the inherent opportunity in podcasting and vodcasting to record their lecture on different topics as podcast or vodcast and distribute such online for their students to study at their convenience and pace, irrespective of their locations. Students can then subscribe to have access, download or have the learning content automatically pushed into their devices when connected to the Internet. This supports the connectivism theory as put forward by Siemens and Downes (2005). Based on the tenets of this theory, Internet provides a global information bank where people can connect in order to access, acquire and share knowledge without restrictions. Also, from constructivism theory (propounded by Vygotsky and Piaget, among others) perspective, being actively engaged in listening to podcasts or watching vodcasts on a given content or topic can significantly increase students' learning experiences which invariably can help them in new knowledge construction, and through constant repetitions can enhance mastery of learning materials.

The use of digital media such as vodcasts has a positive and measurable impact upon learning and teaching when used as an adjunct to the traditional method of teaching. On the benefit of vodcast to education, Michael, *et al*. (2018) opined that video can shift the concept of teaching from didactic approaches to constructivist learning with students able to control aspects of their learning. Video provide a vehicle for increasing access to practical vodcasts. Within just the context of problem-based learning, video clips can be

used to present a problem to students to trigger problem-solving; to provide information around the topic; or to present solutions to the problem at the end of the process (Rasi & Poikela, 2018). When students are involved in solving problems it promotes their thinking capacity, increase their understanding of the content and give opportunity for better application of the knowledge. Vodcast instructional method is an essential motivation component that helps increase students desire to learn and sustain their interest throughout the course of the learning.

Educational use of video podcasts began to surface in 2002 with references to audiographs, video streaming and webcasting. Initially, video podcast was use for entertainment purpose and subsequently education. The use of video podcasts in education was limited by download times and research in this area was minimal (Kay 2021). Between 2006 and 2010, the use of video podcast in education was increase and availability of bandwidth. Smith (2019) research on the use of video podcasts in education shows that the adoption of high speed Internet access increased rapidly in homes and schools.

However, vodcasts application into instructional practices can have some similar or differing impact in academic performance of learners. Study by Taslibeyaz *et al.* (2017) in the context of medical education from 2000 to 2014, predominantly case studies, showed that watching videos was beneficial for gaining clinical skills, changing attitudes, encouraging cognitive learning and retaining knowledge. They offer students the advantages of convenience, ubiquity of access, the ability to self-pace, and the ability to repeat content (Jones, *et al.*, 2022). Robin (2018) opined that for instructors, vodcasts allow standardization and potential modularization of teaching material, and are a convenient tool for flipping the classroom, in a flipped classroom, recorded

lectures, readings, or vodcasts are viewed by students prior to class, and in-class time is devoted to student-centered activities. The use of voice and video for content delivery allow teachers to reach out to a student population born in the digital age. These digital natives are comfortable using the Web to access information, keep in touch with family and friends via email and instant messages, and to access educational content (Center on Technology and Disability 2020).

2.2.6 Review of Related Empirical Studies

Anyanwu, *et al.* (2021) conducted study on Bridging the Gap between Low, Medium and High Ability Students through the use of Computer-Based Multimedia Instruction. The study determined the effects of computer-based multimedia instructional package for bridging the gap between the low, medium and high ability students. The study adopted a pretest, post-test experimental design. Sample consists of 120 second year students (SSII). Solid Geometry Achievement Test (SGAT) was used for collecting data, while Computer-Based Multimedia Instruction that comprised of Animation with Text (AT) and Animation with Narration (AN) was used as treatment instrument. The reliability coefficient of SGAT was 0.78 using Kuder-Richardson (KR-21). Data were analyzed using Analysis of Variance (ANOVA). The results revealed that, significant differences were established in the post-test mean scores of AT, AN and the conventional groups favouring AN. Also, no significant difference were found in the post-test mean scores of high, medium and low ability students taught using AT ($F = 0.218$, $df = 39$, $p > 0.05$) and CAI (AN) ($F = 1.52$, $df = 39$, $p > 0.05$). Based on these findings, it was therefore recommended that mathematics teachers be encouraged to use computer-based multimedia instruction to provide equal opportunity to students of different ability.

The two studies are similar in terms of purpose and the research design adopted for the study as both studies seek to determine the effects of multimedia methods on students ability level also the two studies adopt pre-test, posttest experimental design. Thus, the reviewed study is different from the present study in subject area as the reviewed study was carried out on Solid Geometry while the present study is on General woodwork, also the studies differs in terms of the respondent's because the respondents for the reviewed study were conventional secondary school SS II students while the present study was conducted on NTC II technical college students in Abuja, Nigeria.

Badmos (2019) conducted study on the effects of screencast and podcast on mathematics preservice teachers learning outcomes in Kwara State College of Education Using Kirkpatrics Model. Quazi experimental research design was employed for study. The population of the study comprises all of the mathematics pre-service teachers in the college of education Kwara State while the targeted population was 140 (intact class) of NCE one mathematics pre-service teachers from the selected college of education in Kwara State. A multistage sampling technique was used to assign the college that were used for experimental and control groups. Three instruments were used for the study, mathematics achievement test (MAT); screencast and podcast instructional media (SPIM) and screencast and podcast attitudinal scale (SPAS). Four research questions were formulated for the study and four null hypotheses were formulated and tested at 0.05 level of significance. Mean and standard deviation were used to answer the research questions, one way ANOVA was used to test hypothesis one and two independent sample, t-test was used to test hypothesis three and four in (SPSS version 20.0) at 0.05 level of significance.

The findings revealed that there was significant difference between the mean achievement and retention score of mathematics pre-service teachers taught algebra using screencast and conventional method F (2,137) =106.59, P>0.05. No significant difference between the mean attitude score of mathematics pre-service teachers taught algebra using screencast and conventional method, No significant difference between the mean attitude score of male and female mathematics pre-service teachers taught algebra using screencast and podcast augmented instruction F(1,70)=2.221,p>0.05. No significant difference between the mean achievement score and mean attitude score of mathematics pre-service teachers taught algebra using screencast and podcast augmented instruction (t= 1.54,df = 32, P> 0.05). No significant relationship exist between the mean achievement scores and mean attitude scores of mathematics pre-service teachers taught algebra using screencast and podcast augmented instruction (sig = -0.11, P> 0.05). It was recommended among others that screencast and podcast should be used in day today teaching of mathematics in institution of education, so that students can learn at individual time and pace, which could eliminate the problem of poor performance.

The study reviewed is related to the present sudy because the review study determined the screencast and podcast on mathematics preservice teachers learning outcomes, while the present study is design to determine the effects of basic podcast and vodcast methods on general woodwork students learning outcome in technical colleges in Abuja, Nigeria. The adoption Quazi experimental research design is common to both studies. However, the area of the study and the subjects in the two studies are different.

Nwachokor, *et al.* (2019) Conducted a study on Students' Perception of Vodcast and Podcast as Instructional Material in University of Nigeria, Nsukka. The study was

conducted to examine students' perception of vodcast and podcast as instructional material. The study employed a survey research design. The total sample size for the study was two hundred and twenty-five (225) respondents. Data was analyzed and presented using mean statistic and standard deviation. Hypothesises for the study were analyzed using t-test with a $p \leq 0.05$ level of significance. Students in the study to a low extent (=1.97) agreed that vodcast and podcast increase productivity, promote creativity and facilitate academic learning. Respondents are of the view that the University of Nigeria, Nsukka postgraduate program is not yet advanced enough to use vodcast and podcast technologies for teaching students (=2.88). Unavailability of technologies had a significant influence on barriers that hinder students from using vodcast and podcast. Based on the findings, it is recommended among others, that the University of Nigeria, Nsukka organize a capacity building workshop hinged on the use of top-notch technology for 21st century education; that departments in the university should motivate lecturers to employ technological tools in teaching through incentives as these will encourage every lecturer to key into the move.

The just reviewed study is related to the present study because it focursed on students Perception and moltivation, while the present is also to determine the effects of basic podcast and vodcast on general woodwork students learning outcome in Abuja, Nigeria. Geographical location covered as well as research designs are different from the present studies. However, both studies adopt the use of podcast.

Cheta and Eberechukwu (2018) conducted a study entitled podcast versus vodcast on students' academic achievement in information and communication technology (ICT). This study aims to compared the impact of two innovative pedagogical strategies, vodcast and basic podcast on academic achievement of undergraduate students taking ICT-in-Research, a course in Faculty of Education, University of Port-Harcourt.

Comparative design was adopted for study. The total population was 98 undergraduate's students randomly drawn from the Department of Curriculum Studies and Educational Technology for the 2015/2016 academic session. In which Fifty two (52) and forty six (46) undergraduate students formed the basic podcast and vodcast categories respectively. The instrument was a post 20-item test with a reliability coefficient of 0.60, which was administered to the two categories. T-test statistics was the analytical tool used in testing the two hypotheses of the study. Cheta and Eberechukwu's findings revealed that students taught using basic podcast had higher academic achievements than those taught using vodcast. Hence the recommendation that educators in Faculty of Education, University of Port-Harcourt should mostly adopt podcasting strategy to support their students' knowledge construction process.

The study reviewed is related to the present study because it determined the impact of two innovative pedagogical strategies, vodcast and basic podcast on academic achievement of undergraduate students taking ICT-in-Research, while the present study also determine the effects of basic podcast and vodcast on students learning outcome on general woodwork in technical colleges in Abuja, Nigeria. Even though the study reviewed adopted a quasi-experimental research design which is similar to the design adopted by the present study; it differs in poplation and area of the study.

Francom, *et al*. (2018) carried out study on the effects of podcasting on college student achievement and attitude. In this mixed methods study, weekly podcasts written and recorded by course instructors to summarize college course content, were used to study the impact, if any, on student achievement and attitudes. Specifically, weekly summative podcasts were posted on an Internet website in Windows Media format and downloaded by college students. After 4 weeks of podcasts, students were assessed and

evaluated as results were compared to similar classes that did not use podcasts. The podcast-viewing students completed a questionnaire and were interviewed to record their views, perceptions and attitudes. Teachers involved were also interviewed. Although not generalizable, the results of this study indicate that weekly podcast summaries were an effective teaching tool, which produced improved student outcomes and caused students to view optimistically their evaluation preparation and comprehension of course content.

The just reviewed study is related to the present study because it focursed on students Academic achievement and Atittude, while the present is also to determine the effects of basic podcast and vodcast on general woodwork students learning outcome in Abuja, Nigeria. Geographical location, subject area, population covered as well as research designs are different from the present studies. However, both studies adopt the use of podcast.

Nesrin and Yasemin (2018) carried out study on the effects of video podcast technology on peer learning and project quality. In this study, the effects of video podcast technology on broadcasting students' project quality and on peer learning are examined. Herein, the post-test control group model is used. While the experimental group submitted their work through video podcast technology, the control group submitted their work via CD. In the study, the experimental design of the post-test control group was used. Independent sample T-test was use to analyzed data collected. The research group is consisted of 94 freshman students from the department of Computer and Educational Technology at Marmara University. The research was conducted in the scope of the Information Technologies in Education II course, and 52 students were selected for the experimental group and 42 for control group. The quality of the projects

is studied under two sections, namely content and design presentation. To compare the groups in terms of peer learning, both groups benefited from the results of the peer learning exam. At the end of the research no significant difference is found between the group submitting their assignments by video podcast and the group submitting by CD in terms of the content quality of projects and peer learning. When the groups are compared in terms of project design and presentation quality, there is a significant difference in favor of the group using video podcasting. It was also revealed in the study that students' interest towards their classmates' video podcasts changed throughout the study.

The above reviewed study is related to present study in terms of instructional method adopted for study (podcast) and design of the study because both study adopt experimental design. However, the study differs from the current study in terms respondents the reviewed study were on broadcasting students' project quality and on peer learning are examined While the present study on General woodwork students learning outcome. The study also differs in terms subject area the reviewed study was on broadcasting, project quality and on peer learning while the present study is on General woodwork trade. The studies also differ in terms of geographical location, scope of the study, sample size, population and method of statistical analysis.

Ehsan, *et al.* (2017) conducted study on the effects of using podcast on listening comprehension among Iranian pre-intermediate EFL learners. The study aimed to explore the effects of using podcast on listening comprehension among Iranian pre-intermediate EFL learners. The populations of the study were 60 language learners who were selected among 90 pre-intermediate students from Poyesh English language institute in Dehloran, Iran. They were all female students and their age range was from

12 to 20. Then they were non-randomly divided into two equal groups of control (n=30) and experimental (n=30). The participants were further assigned as the control group who were taught using traditional methods of teaching listening with no multimedia laboratory. But the experimental group attended multimedia language laboratory and had a personal computer, so that they could use podcasts of listening materials. After 20 sessions of treatment, the two groups were administered the same teacher-made listening test as post-test. The researcher employed all the formulas with the level of significance set at 0.05. Data were analyzed by Paired and Independent Samples t-test. The findings showed that the experimental group significantly performed better than the control group. Generally, the experimental groups outperformed the control groups. The results suggest that podcasts can be used in English classes to develop listening ability among Iranian EFL learners.

The two studies determined the effects of podcast instructional method on students' learning outcome. The differences between this study and the present study is that the study was conducted to determine listening comprehension among Iranian pre-intermediate EFL learners while, present study was carried out in technical colleges in Abuja to determine the students learning outcome in General woodwork trade. The studies also differ in terms of geographical location, scope of the study, sample size, population and respondents.

Rostami, *et al.* (2017) carried out a study on the Effect of Podcasting on Iranian EFL Learners' Motivation and Attitude. The aim of this study was to identify the effect of podcasting on Iranian learner's motivation and attitude. The respondents of the study consist of 60 male students including 30 participants for the experimental group and 30 for the control group. All of them were studying in the second junior high school in

Shahed school in Semnan, Iran. Their age ranged from 13 to14. Shahed school was randomly selected by researchers from a list of all junior high schools in Semnan province. Questionnaire and interview were used to collect by data. In the present study, Nelson's proficiency test was used for homogenizing the learners. A 46-item motivation questionnaire focused on evaluating English learners' beliefs and attitudes in Iran. A 7-item researcher-made interview was conducted with 10 participants. The main purpose of this interview was to investigate the effect of podcasting on the learners' attitude. The results of data analysis revealed that the application of podcasts as a motivational teaching strategy significantly benefited the experimental group to show a higher mean on classroom motivation. It also revealed that the application of podcast changes the learners' motivation positively.

The study of Rostami, *et al.* are similar to this study in terms of instructional method (podcast) adopted for the study. However, the study is different from the present study in terms of geographical location because the present study was carried out in Iran while the present study is conducted in Nigeria precisely in Abuja also in the subject area the reviewed study was on English learners in comparison with General woodwork and the study also differs in the light of the population and sample size.

Bimpe, *et al.* (2016) conducted study on the efficacy of podcast on Nigeria Certificate of Education Biology student's achievement in individualized and collaborative settings. c. The selected students were divided into three groups: Think-pair-share, reciprocal peer teaching group (experimental group) and control group (individual setting). Podcast package on teaching and learning of Biology (PPTLB) and plan physiology concept on achievement test (PPCAT) were developed and validated by the technology and Biology experts respectively with reliability coefficient of 0.74 using

Kuder Rechadson ($KR-_{21}$) which is considered reliable. Four research question and null research hypotheses were formulated to guide the study and the hypotheses were tested at 0.05 level of significance. The data obtained from the study were statistically analyzed by analysis of covariance (ANCOVA) using statistical package for social sciences (SPSS) version 20.0A. Bimpe *et al.* (2016) findings indicated that reciprocal peer teaching enhanced student's achievement than individual settings and think-pair-share strategies. The result of the findings revealed that the individual learning strategies is gender sensitive in favour of male students. Thus it was recommended that prospective teachers should be exposed to the use of podcast for collaborative learning to supplement the lecture method.

The reviewed study was aimed at investigating the efficacy of podcast on Nigeria Certificate of Education Biology student's achievement in individualized and collaborative settings in Nigeria using quasi-experimental Solomon III design for the study while the present study is also to determine the effect of basic podcast and vodcast on students achievement, interest, retention and ability level in Federal science and technical colleges in Abuja using the factorial experimental design and population is TC II students.

The study is related with the current study in terms of instructional method (podcast) adopted for the study. However, the study differs in subject area because the reviewed study is on Biology while the current study is on General woodwork and study differs also differs in study area as reviewed study was conducted in Niger State and Federal Capital Territory while the current study was carried out in Abuja only. The study also differ in terms of respondents as the respondents of the reviewed study was on pre-

service teachers in college of education while the current study respondents are technical college students.

Robi (2016) conducted study on students' perceptions towards the use of podcast in learning English: a case study of the second grade students at one high school in Bandung. This study was employed to investigate the students' perception towards the use of podcast in learning English. In addition, the problems that the students encountered were also investigated. Survey research method was employ for study. The study population involved thirty-three (33) students of the second grade in one high school in Bandung as participants. Questionnaire and interview were the instruments used in this study to collect the data. The questionnaire was analyzed qualitatively by using Likert Scale and the result of the questionnaire was interpreted descriptively. After having the findings, the study showed that the students had positive attitude towards podcast. Most of the participants agreed that they like podcast because it helped them in learning English. The content and clear native pronunciation derived from podcast also engaged their interest and made learning more exciting. However, there were also some problems faced by students in using podcast. The main problem that the students encountered was the length of podcast which was too long. Another problem was caused by lack of sophisticated gadget such as smartphone, laptop, and also internet access that made students find it hard to get podcast. Nevertheless, the findings suggest that podcast can be a good tool in improving students' English skills. Robi's study is similar with the present study in terms of instructional approach (podcast).

The study is different from the current study in terms of purpose because the reviewed study aim to investigate the students' perception towards the use of podcast in learning English and also investigate problems encountered by students when using podcast

while the present study aim to determine the students achievement and retention in General woodwork and assess the interest and ability level of the student in General woodwork trade. The study also differs in terms of research design and method of data analysis as Robi's study employed survey research design while the current study employed quasi-experimental research design for the study. The study differs in Geographical location as Robi's study was conducted Indonesia, the current study was carried out Nigeria and lastly the study also differs in terms of subject area Robi's study were on English language while the current study General woodwork.

Chester, *et al.* (2015) conducted a study on podcasting in education: student attitude, behavior and self-efficacy. The aim of the study was to describe the characteristics of podcast users, compare uptake across courses, examine preferred modes of use and satisfaction, assess the impact of podcasts on lecture attendance, and evaluate reasons for use and non-use. Survey research design was employed for study. The two surveys developed for this study used a range of items from previous research. The first questionnaire included 26 scale response and open-ended questions covering demographic details and the second questionnaire consisted of 20 questions, focusing on the use of lecture recordings for examination revision. Population for the study was 273 undergraduate students enrolled in six diverse courses at a large Australian university. Questionnaire was use for collection of data. Data collected was analysed using Cronbach's Alpha formula. Results suggested differences in uptake and satisfaction across courses, with later year students more satisfied than first year students. Although podcast users were older, worked longer hours in paid employment, and attended fewer lectures than those who did not use podcasts, results also suggest that users had more contact with staff and reported higher levels of academic self-efficacy than nonusers. Suggestions for improvements to current podcasting provisions are offered and

directions for future research are provided. In particular the study also revealed the need to tap into the use of podcasts for examination preparation.

The reviewed study is similar with the present study in terms of instructional approach (podcast). However, the study is different from the current study in terms of purpose because Chester, *et al* study aim to describe the characteristics of podcast users, compare uptake across courses, examine preferred modes of use and satisfaction, assess the impact of podcasts on lecture attendance, and evaluate reasons for use and non-use while the present study aim to determine the students achievement and retention in General woodwork and assess the interest of the student in General woodwork trade. The study also differs in terms of research design and method of data analysis the reviewed study employed survey research design while the current study employed quasi-experimental research design for the study. The reviewed study was conducted in Australia while the current study was carried out in Nigeria and lastly the respondents of the reviewed study were university students while the respondents of the current study are technical college students.

2.2.7 Summary of Literature Reviewed

This study reviewed literatures on the academic achievement, ability level, and retention, concept of basic podcast instructional method, vodcast instructional method, and student's interest toward general woodwork. The literature reviewed showed that the selection of an appropriate teaching method is important to the success of the teaching and learning process. General woodwork is a practical oriented trade subject that requires the leaner to be impacted with both the scientific and practical knowledge to qualify them fit into the world of work. The emerging new technologies, in the teaching profession evolving from an emphasis on teacher-centred, lecture-based

instruction to student-centred interactive learning environments, teaching methods should be changed to reflect a modern society mandating the need to produce more functioning, thinking-oriented and decision-making students. This call for the shift from teacher-centred method to student-centred method. Basic podcast and Vodcast method are teaching methods that can be used in place of the teacher- centred to student-centred method of teaching and learning.

Relevant theories such as Constructivism theory of learning and Cognitive Theory of Multimedia Learning were discussed with respect to their relationship with the present study. The concepts of these theories explains how people might acquire knowledge and learn, it suggests that humans construct knowledge and meaning from their experiences and also how learning occurs when people build mental representations from words and pictures. It therefore has direct application to education. The reviewed of related literature and theories were used to guide the researcher in selecting instructional method, design and means of data analysis. The conceptual frameworks in these study, discussed the relationship between basic podcast, vodcast, student's interest, ability level, academic achievement and retention, and how these variables are related to the study. From the review of related literature, much research work has been conducted on podcast instructional method and other instructional methods for improving students' academic achievement and retention in various educational levels. The impact and benefit of podcast method to education has been investigated by researchers. However, many researchers are of the view that podcast instructional method is good tools for improving the academic achievement of the learners. Many research works has also shown that ability level and interest is a factor that can determines academic achievement of the learner. However, researchers are still having different opinion on

their effect on academic achievement, while some are that it has positive affect, others are of the view that they make no difference.

The review of the related literature showed that studies have been conducted on podcast instructional methods and other teaching methods for improving students' achievement, retention, interest, communication skills and problem-solving skills in different field and also at different educational level (Primary, secondary and tertiary education). Study carried out by Umar (2018) also revealed that General woodwork students of technical college are still lacking the required knowledge and skills to be employed as craftment in woodwork industries which may be due to impropriate instructional methods employed for teaching General woodwork trade. Considering the literature reviewed the teaching and learning of general woodwork remains a matter that needs to be tackled from all its ramifications. The methods and strategies employed to teach difficult trade like GWW in technical colleges in Abuja, Nigeria needs to be given serious attention. Researchers have recommended the use of basic Podcast and vodcast instructional strategies to teach problem areas at levels of education both nationally and internationally. Although literatures reviewed by researchers such as Badmos (2019) revealed that very little research has been carried out on basic Podcast and vodcast instructional method on student's achievement, interest, ability level and retention in technical colleges in Nigeria but results have been found to be contradictory and inconclusive. However, it is necessary to establish a teaching strategy, which is highly applicable to School education curricula and effective in teaching General woodwork trade in technical colleges, and in which most students are interested. Therefore, based on this reason, this study seeks to fill the gap by determining the effects of basic podcast and vodcast instructional method on General woodwork students learning outcomes in technical colleges in Abuja, Nigeria.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research Design

A quasi-experiment of research design was used in this study. Specifically, the pretest-posttest, non-equivalent control group design was adopted for the study. The quasi experimental design was used because the classes of students are already organized into intact classes to provide for stability and avoid disruption of class lessons and class arrangement. It is a suitable alternative for experimental design when randomization is not use or applied (Eze, *et al*., 2018). The study design was used to compare the performance of general woodwork students taught with basic podcast and vodcast instructional methods. The process focused on academic achievement, interest, ability level (high, medium and low) and retention of students in general woodwork.

Furthermore, in the analysis, 2×3×3 factorial design was adopted to present the treatments (Basic podcast instructionl method and vodcast instructionl method) at two levels and ability (low, medium and high) at three levels. Hence, the researcher was able to assess the effect of the main independent variables (Basic podcast and Vodcast instructional Method on student's Academic achievement, Interest and Retention) as

well as the effects of moderator variables (Ability levels low, medium and high) on cognitive achievement, Retention and interest of Technical College students in Genaral Woodwork Trade. The design is represented below.

Group A: O_1 X_1 O_2, O_3

Group B: O_1 X_2 O_2, O_3

Where; O_1 represents pretests

O_2 represents posttests

O_3 represent delayed posttest

X_1 Basic podcast Instructional Method treatment

X_2 Vodcast Instructional Method treatment

The two conditions for the factorial design is presented in table 3.1

Table 3.1

Factorial Design Groups Assigned to the two conditions

Abilty Level	Types of Instruction	Dependent Variables		
Group 1 Low ability scores	Basic podcast	Pre-test score on students achievement/ Interest	Posttest score on students achievement/ Interest	Delay score on students retention
Group 2 medium ability scores	Basic podcast	Pre-test score on students achievement/ Interest	Posttest score on students achievement/ Interest	Delay score on students retention
Group 3 high ability scores	Basic podcast	Pre-test score on students achievement/ Interest	Posttest score on students achievement/ Interest	Delay score on students retention
Group 4 Low ability scores	Vodcast	Pre-test score on students achievement/ Interest	Posttest score on students achievement/ Interest	Delay score on students retention
Group 5 medium ability scores	Vodcast	Pre-test score on students achievement/ Interest	Posttest score on students achievement/ Interest	Delay score on students retention
Group 6	Vodcast	Pre-test score on	Posttest score on	Delay score on

high ability scores		students achievement/ Interest	students achievement/ Interest	students retention

3.2 Area of the Study

The study was conducted in the Federal Capital Teritory (FCT) Abuja. There are three public Science and Technical Colleges in FCT, Abuja. These are Federal Science and Technical College (FSTC) Orozo, Government Science and Technical College (GSTC) Kwali and Government Science and Technical Tollege (GSTC), Garki, Abuja. The Federal Capital Territory is located at the northern confluence of river Niger and river Benue. It is boardered by the state of Niger to the west and northwest, Kaduna to the northeast, Nassarawa to the east and south and Kogi to the southwest occupying a total land mass area of 7,315km^2 (2,824sq mi) (Federal Capital Territory Administration-Facts 2018). Abuja was choosing for the study because of availability of internet facilities, and ICT gargets (Android phones, labtops, projectors and Mp3 players) used in the study.

3.3 Population of the study

The targeted population of the study was 156 NTC II students of General woodwork trade for 2019/2020 academic session in the three Technical Colleges in Abuja, Nigeria. NTC II students were choosing because they are already familiar with the system. The population distribution is presented in table 3.2 below.

Table 3.2
The population distribution of the Students in each of the School Selected

S/NO	Names of School	Students Population
1	Federal Science and Technical College (FSTC), Orozo, Abuja	72
2	Government Science and Technical College (GSTC), Garki, Abuja	54
3	Government Science and Technical College (GSTC), Kwali,	30

	Abuja.	
	Total	**156**

Source: Students Register from each of the Technical College for the 2019/2020 academic session.

3.4 Sample and Sampling Techniques

Simple ramdom sampling techniques was used to select two college that were used for the study.The selected colleges are FSTC Orozo and GSTC Garki, Abuja. The NTC II general woodwork students of the two colleges were already organized into intact class. In addition, a simple random sampling technique was also 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 with 72 students (Basic podcast) while the experimental group B Government Science and Technical College, Garki, Abuja with 54 students (vodcast). The population was also stratified into different ability levels based on their performance in the previous General woodwork examination. The criteria for high ability students was based on students whose previous average in the general woodwork examination fall within the first 70% and above, the medium ability students' score within middle 40 to 69% while the low ability level students who score below 40% (Apendix L, page 138). The sampled size is presented in table 3.3

Table 3.3

Table for the sampled size

S/NO	Names of School	Students Population
1	Federal Science and Technical College (FSTC), Orozo, FCT Abuja	72
2	Government Science and Technical College (GSTC), Garki,	54

Abuja	
Total	**126**

3.5 Instrument for Data Collection

The instruments for data collection ware General woodwork Achievement and Retention Tests (GWWART) (Appendix C page, 123) and General Woodwork Interest Inventory Test (GWWIIT) (Appendix F, page 132). The General woodwork Achievement Test consist of Fourty (40) multiple choice questions with four options lettered A to D with only one correct answer and each question carry two and half ($2_{1/2}$) mark. The items of the achievement test were constructed by the researcher covering the topics considered in this study. The general woodwork interest inventory test consist of twenty (20) items questionnaire designed to generate information on interest of general woodwork students before and after the treatment. The items of the inventory test were based on five point scales of Strongly Agreed (SA), Agreed (A), Disagreed (D), Strongly Disagreed (SD), and Undecided (UD).The decision mean was 3.0 a mean respond of 3.0 and above was considered positive while a mean response of 3.0 below was considered negative. A table of specification for the test is shown in Appendix G, page 133.

3.6 Lesson Plan

The basic podcast and vodcast instructional lesson plan was developed by the researcher base on the contents of the General woodwork trade. The prepared lesson plans were used in teaching the two experimental groups. Each of the lesson plans has at least two to four instructional objectives constructed into it that was used to guide the lesson. The two set of the lesson plans contain five topics that lasted for a period of five weeks and the two lesson plan consist of the lesson topic, specific objectives, previours knowledge,

teaching aids and the instructional procedure. The instructional procedure showed details of the steps, introduction, students and teachers' activities, evaluation and summary. Each topic in the lesson plan was recorded by the researcher and uploads over the internet and delivered in the classroom by the regular class teacher and after which the students download to their devices and study at their own pace. The experimental group one (basic podcast) were taught with the audio version while the experimental group two (vodcast) were taught with both audio and video version.

Basic podcast is the audio version of the learning contents with the teachers' voice explaining the content of the lesson that is expected to be achieved. The students listen to the recorded lesson in the class room and then download it to their own devices listen over and over again outside the class room and engage them self in the assigned task independently and interacting with other peers. While vodcast is similar to basic podcast but this contain both audio and video version of the learning content the teachers explaining and demonstrating the contents of the lesson that is expected to be achieved at that period of time. The students also listen to the lesson in the class room and then download it to their own devices watch and listen at their own convenience outside the class room and also involve in the assigned task by creating their own podcast for feedback. (See Appendix A, page 103) for basic podcast lesson plan and (Appendix B, page 113) for vodcast lesson plan. The instructional package is attarched to the work.

3.7 Validation of the Instrument

The General woodwork achievement and retention test, interest scale and the two lesson plans were subjected to thorough scrutiny and proof reading to ensure content validity by three experts from Industrial and Technology Education Department, Federal university of technology Minna, The face validation involved checking the items of the instruments for appropriateness in arrangements and logical sequence of the test

instruments, lesson plan, and basic podcast and vodcast instructional method. Based on the experts' correction and suggestion, final copies were made as observed by the experts. (See appendix I, page 135)

3.8 Reliability of the Instrument

The instrument was pilot tested using 30 randomly selected NTC II General Woodwork students of Suleman Barau Technical College, Suleja through the use of split half method. The reliability of the General WoodWork Achievement and Retention Test (GWWART) was determined using Kuder Richardson formula (K-R20) and was found to be 0.78 (Appendix J, page 136). Cronbach Alpha formula was used to determine the internal consistency of General WoodWork Interest Inventory Test (GWWIIT) and yieded 0.85 (appendix K, page 137). The data collected was analysed using the statistical packages for social sciences (SPSS version 23). More also the ability level test show that from the 30 students which 40 questions were administerd to show that 8 students had the high ability level of 26.7%, 15 students had the average ability level of 50% and 7 students had low ability level of 23.3%.

3.9 Experimental Procedure

Two teaching methods that were used for the study include: basic podcast and vodcast. Basic podcast instructional method was used to teach the experimental group A and vodcast instructional method was used to teach the experimental group B. Each topic in the lesson plan were recorded by the researcher and upload on the internet and downloaded by the research assistant and present it to the students using laptop, projector and MP3 player. After the lesson, the students downloaded the lesson to their own devices and listen or watch at their own convenience. This allows the students to make connections and link the main topics with the sub-topics of the lesson. The basic

podcast lesson plan is the same as the vodcast method lesson plan in terms of content to be taught, instructional objective and method of evaluation. The only difference between them was that students downloaded both video and audio files in vodcast as against downloading only audio files in basic podcast.

A week before the commencement of the experiment, research assistants were trained on the entire process to ensure that they have mastered the application of the instructional methods to enable uniformity across the groups, after which pre-test was administered to the students in the sampled classes through their class teachers (research assistants) in the treatment groups. Results obtained from the pre-test provided the baseline data on the dependent variable (achievement, interest, retention and ability level) before the treatment. Thereafter, Five weeks of experimental treatment for the study was given to the two treatment groups, in which the students were taught with basic podcast instructional method in group A and vodcast instructional method in group B as detailed in the lesson plan using there normal school time table and the period allocated to General woodwork lesson. Post-test were administered to the two groups right away after the end of the lessons by the General woodwork teachers in their respective schools. The result obtained from the post-test exercise provided post-treatment data for the study on achievement, interest, retention and ability level of general woodwork trade. Two weeks after the posttest treatment, GWWART was reshuffled and administered as retention test to determine the retention capacity of the learnt knowledge and skills by the students. The whole exercise lasted for seven (8) weeks. Beginning from 13/09/2021 and came to an end on 05/11/2021.

3.10 Control of Extraneous Variables

The researcher made an attempt to control the following variables.

Experimental Bias: In order to reduce the experimental bias, the regular subject class teachers in the participating schools teach their own students. Hence, the researcher was not directly involved in administering the research instrument. To control the invalidity that could be caused by the teacher variability and to ensure uniform standards in the conduct of the research, the researcher personally prepare the lesson plan, the instructional methods and the test instruments to avoid further bias.

Training of Teachers: In order to ensure that errors which might arise from teacher variable did not affect the conduct of the research, the researcher held a training session with the teachers (research assistant) on the instructional procedures in order to ensure uniformity of instruction across the groups. The training was based on the purpose of the study, topics that was taught and how the lesson was presented to the students via basic podcast or vodcast and the general conduct of the study (see appendix N, page 141 for training manual).

Hawthorne Effect: Hawthorne effect is a situation where the performance of research subject is affected due to the fact that the students are conscious of the fact that they are involved in an experiment. In order to reduce this problem, the researcher used the normal class-room teacher for both experimental groups; the students were not informed that they were involved in any research process. Also, the researchers used the normal classroom timetable and were not taught outside their syllabus.

3.11 Administration of the Instrument

Woodwork teacher administered the pre-test to both basic podcast and vodcast groups in their respective colleges. During the pre-test, the achievement test and interest inventory test were administerd to the two experimental groups (basic podcast and vodcast groups) respectively to determine the level of achievement and the level of there interest

in General woodwork after the treatment. Objective answer sheets were provided for the students to fill in the correct answer for the achievement test (Appendix E, page 131). As regards to interest inventory test, students were allow to check (√) to indicate the degree of which they agree or disagree with the items contained in the interest inventory test. The researcher mark the answer sheet of the achievement test to obtain the students score on the cognitive achievement before the treatment. While the interest inventory was scored by the researcher to determine each of the students interest before the treatment. The exercise provides base line data on each of the two dependent variables (achievement and interest).

Similary, during the post-test the woodwork teacher administered the post- test to the treatment groups in their respective colleges. In the post test, the achievement test and interest inventory test was administered on both groups (basic podcast and vodcast). Objective answer sheets were provided for the students to fill in the correct answer for the achievement test. The students were ask to cheek (√) to indicate the degree to which they agree or disagree with the items contained in the interest inventory test. Two weeks after the post treatment test has been administered to experimental groups, the same achiement and retention test was reshuffled (as question one to become question twenty and becoming one) and it was administered as test for retention of learning on the students by respective teachers that taught the groups (i.e basic podcast and vodcast groups). The researcher mark the answer sheets of the achievement and interest inventory tests to obtain students score on achievement after treatment.While interest inventory were served by the researcher to determine each of the students intrest after the treatment. The exercise provides post treatment data of the dependend variables (Achievement, interest and retention on the two groups) after treatment.

3.12 Method of Data Analysis

The data collected were analysed in line with the research questions and hypotheses formulated for the study. Mean and standard deviation was used to answer the research questions while Analysis of Covariance (ANCOVA) statistics was used to test the null hypotheses at 0.05 level of significance. The decision on the research questions was based on the mean gain score. Group that have higher mean gain score regardless of the closeness in the mean gain score of the other group was taken to have performed better in achievement test or retention test. The decision on the hypotheses was based on comparing the P-value on the output of the statistical tool used with a significance level of 0.05. The null hypothesis was rejected when P-value is less than 0.05. Otherwise, the null hypotheses are accepted. 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 there previous term 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, was used for the data analysis.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Research Question 1

What is the effect of basic podcast and vodcast instructional methods on student's achievement in General woodwork in technical colleges in Abuja, Nigeria?

The data for answering research question one were presented in table 4.1

Table 4.1

Pretest-posttest mean Achievement Scores of experimental groups taught general woodwork using basic podcast and vodcast instructional Methods.

Groups		Pretest		Posttest		
	N	Mean	SD	Mean	SD	Mean Gain
Basic Podcast	72	26.53	9.73	57.27	16.56	30.74
Vodcast	54	27.23	9.93	59.42	21.73	34.30

Table 4.1 show that the pre-test of the basic podcast group mean achievement score is 26.53 with standard deviation of 9.73 while a mean score of 57.27 was gotten in the post-test with standard deviation of 16.56. 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 9.93 and a post-test mean of 59.42 with standard deviation of 21.73 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

4.2 Research Question 2

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

The data for answering research question two were presented in table 4.2

Table 4.2

Pretest-posttest mean interest Scores of experimental groups taught general woodwork using basic podcast and vodcast instructional Methods.

Groups		Prettest		Posttest		
	N	Mean	SD	Mean	SD	Mean Gain
Basic Podcast	72	27.65	10.96	41.59	6.06	13.94
Vodcast	54	26.38	9.76	43.54	6.79	17.16

Table 4.2 revealed that interest inventory score of students on general woodwork using Basic podcast and vodcast instructional method. The pretest mean score of students taught GWW using basic podcast method was 27.65 with standard deviation of 10.96 and the mean score for post-test was 41.59 with standard deviation of 6.06 while the pretest, post-test mean-gain was 13.94. The pretest mean score of GWW students taught using vodcast method was 26.38 with standard deviation of 9.76 and a mean score for post-test was 43.54 with standard deviation of 6.79 while the pretest, post-test mean

gain was 17.16. The results revealed that each instructional method has significant increase on students' academic interest. However, the mean gain of students taught GWW using Vodcast method had higher mean gain compared with students taught GWW using basic podcast instructional method.

4.3 Research Question 3

What is the effect of basic podcast and vodcast instructional methods on student's retention in General woodwork in technical colleges in Abuja, Nigeria?

The data for answering research question three were presented in table 4.3

Table 4.3

Posttest and retention Scores of experimental groups taught general woodwork using basic podcast and vodcast instructional Methods.

Groups		Prettest		Posttest		
	N	Mean	SD	Mean	SD	Mean Gain
Basic Podcast	72	57.27	16.55	59.42	17.22	21.50
Vodcast	54	63.08	21.73	60.15	20.41	31.30

Table 4.3 shows that Vodcast teaching method is more effective than the basic podcast in improving the academic retention of students in General woodwork. The basic podcast group had a mean score of 57.27 in the post-test with standard deviation of 16.55 and a mean score of 59.42 in the retention test with standard deviation of 17.22 while the post-test, retention test mean-gain in basic podcast was 21.50. The vodcast group post-test mean score was 63.08 with standard deviation of 21.73 and the mean of retention test was 60.15 with standard deviation of 20.41 while the mean-gain from post-test, retention test was 31.30. Based on the use of vodcast and basic podcast methods in teaching GWW revealed that there was a significant difference in favour of

vodcast group. The result revealed that, retention mean score of vodcast group is greater than the mean retention score of the students in the basic podcast group. Therefore, vodcast method is more effective than the basic podcast in improving the academic retention of students in General woodwork.

4.4 Research Question 4

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

The data for answering research question four were presented in table 4.4

Table 4.4

Pretest-posttest mean Achievement Scores of high, medium and low ability level student's 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	22	38.77	3.46	76.86	6.40	38.09	14	41.67	1.57	93.67	5.13	52.00
Medium	38	26.33	2.70	57.79	7.05	31.46	32	27.67	2.07	65.17	3.25	37.50
Low	12	12.85	4.39	33.50	4.45	20.65	8	15.75	1.26	37.00	1.41	21.25

Table 4.4 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 deviation1.41 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.

4.5 Research Question 5

What is the effect of high, medium and low ability level student's interest in general woodwork when taught using basic podcast and vodcast methods in technical colleges in Abuja, Nigeria?

The data for answering research question five were presented in table 4.5

Table 4.5

Pretest-posttest mean interest Scores of high, medium and low ability level student's 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	22	45.00	5.09	50.00	0.00	5.00	14	40.00	0.00	50.00	0.00	10.00

Medium	38	22.02	2.47	40.18	1.32	18.16	32	27.17	2.31	45.00	5.48	17.83
Low	12	20.00	2.60	35.00	5.09	15.00	8	15.00	3.56	36.50	4.73	21.05

Table 4.5 shows that, the high, medium and low ability students taught general woodwork with basic podcast method had pre-test mean interest scores as follows high 45.00 with standard deviation of 5.00 and posttest score of 50.00 with standard deviation of 0.00, medium pre-test mean interest score 22.02 with standard deviation of 2.47 and posttest score of 40.18 with standard deviation of 1.32 and low has pre-test mean interest scores 20.00 with standard deviation of 0.00 and posttest score of 35.00 with standard deviation 5.09. The mean gained between the ability level of pre-test and post-test of basic podcast group was 38.00. The high, medium and low ability students taught general woodwork with vodcast method had pre-test mean interest score of high 40.00 with standard deviation of 0.00 and posttest interest score of 50.00 with standard deviation of 0.00, medium pre-test mean score 27.17 with standard deviation of 2.31 and posttest score of 45.00 with standard deviation 5.48 and low had pre-test mean interest score of 15.00 with standard deviation of 3.56 and posttest score of 36.50 with standard deviation 4.73 The mean gained between the pre-test and posttest of the vodcast group was 49.33. This indicated that, students taught general woodwork using vodcast instructional method had higher mean interest scores than students taught using basic podcast instructional method.

4.6 Research Question 6

The effect of basic podcast and vodcast methods on high, medium and low ability level student's retention in general woodwork in technical colleges in Abuja, Nigeria?

The data for answering research question six were presented in table 4.6

Table 4.6

Posttest and retention Scores of high, medium and low ability level student's taught general woodwork using basic podcast and vodcast instructional Methods.

Ability Level	Basic Podcast						Vodcast					
		Posttest		Retention				Posttest		Retention		
	N	Mean	SD	Mean	SD	Mean Gain	N	Mean	SD	Mean	SD	Mean Gain
High	22	76.86	6.40	80.77	7.82	38.09	14	93.67	5.13	89.00	3.61	46.70
Medium	38	57.79	7.05	59.32	6.03	1.53	32	65.17	3.25	61.67	5.89	35.00
Low	12	33.50	4.45	35.00	9.95	1.50	8	37.00	1.41	36.25	1.26	07.50

Table 4.6 shows that, the high, medium and low ability students taught general woodwork with basic podcast method had post-test mean achievement scores as follows high 76.86 with standard deviation of 6.40 and retention score of 80.77 with standard deviation of 7.82, medium post-test mean score 57.79 with standard deviation of 7.05 and retention score of 59.32 with standard deviation of 6.03 and low has post-test mean achievement scores 33.50 with standard deviation of 4.45and retention score of 35.00 with standard deviation 2.95. The mean gained between the ability level of pre-test and post-test of basic podcast group was 41.12. The high, medium and low ability students taught general woodwork with vodcast method had post-test mean achievement score of high 93.67 with standard deviation of 5.13 and retention score of 89.00 with standard deviation of 3.61, medium post-test mean score 65.17 with standard deviation of 3.25 and retention score of 61.67 with standard deviation 5.89 and low had 37.00 with standard deviation of 1.41and retention score of 36.25 with standard deviation1.26 The mean gained between the post-test and retention of the vodcast group was 89.20. The results revealed that each instructional method has significant increase on high, medium

and low ability student but vodcast instructional method had higher mean retention scores than students taught using basic podcast instructional methods

4.7 Hypothesis 1

Ho_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 Hypothesis one is shown in table 4.7

Table 4.7

Summary of Analysis of Covariance (ANCOVA) for Test of Significant Difference between the Mean Achievement Scores of students taught GWW 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 4.7 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 4.64 with p-value of 0.043 is less than 0.05. 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.

4.8 Hypothesis 2

Ho_2: There is no significant difference between the mean Interest scores of students taught General Woodwork students taught using Basic podcast and Vodcast Instructional Method.

The data analysis for Hypothesis two is shown in table 4.8

Table 4.8

Summary of Analysis of Covariance (ANCOVA) for Test of Significant Difference between the Mean Interest 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	3125.407[a]	2	1562.704	121.252	.000
Intercept	12722.059	1	12722.059	987.122	.000
Pre-test	3081.277	1	3081.277	239.081	.000
Groups	74.481	1	74.481	5.779	.018
Error	1585.228	123	12.888		
Total	224796.000	126			
Corrected Total	4710.635	125			

a. R Squared = .663 (Adjusted R Squared = .658)

Table 4.8 revealed that F-value for the test of significance among the interest score students in the two instructional methods (basic podcast and vodcast) in General woodwork test. The calculated F-value of 5.779 and p-value of 0.018 is less than 0.05. Therefore, the null hypothesis is rejected. This implies that there was significant difference in the mean interest scores of students taught general woodwork using basic podcast and vodcast instructional techniques. It was further revealed that interest of students taught general woodwork using vodcast was significantly better than students exposed to basic podcast instructional techniques

4.9 Hypothesis 3

Ho_3: There is no significant difference between the mean retention scores of General Woodwork students taught using Basic Podcast Instructional Method and those taught using Vodcast Instructional Method.

The data analysis for Hypothesis three is shown in table 4.9

Table 4.9

Summary of Analysis of Covariance (ANCOVA) for Test of Significant Difference between the Mean Retention Scores of General Woodwork Students taught using Basic podcast Method and those taught using Vodcast 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 4.9 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 was a significant difference in the mean retention scores of GWW students taught with Basic podcast Instructional Method and those taught using Vodcast Instructional Method.

4.10 Hypothesis 4

Ho_4: There is no significant difference in 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 four is shown in table 4.10

Table 4.10

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 4.10 shows the F-calculated value 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 cognitive achievement scores of students taught general woodwork using Basic podcast and vodcast teaching methods.

4.11 Hypothesis 5

Ho_5: There is no significant difference in the mean scores of high, medium and low ability level student's interest in general woodwork when taught using basic podcast and vodcast instructional methods.

The data analysis for Hypothesis five is shown in table 4.11

Table 4.11

Summary of Analysis of Covariance (ANCOVA) for Test of Significant Difference between the Mean interest 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	3613.066[a]	3	1204.355	133.870	.000
Intercept	2896.940	1	2896.940	322.008	.000
Pre-test	1.834	1	1.834	.204	.652
Ability level	589.491	2	294.745	32.762	.000
Error	1097.569	122	8.996		
Total	224796.000	126			
Corrected Total	4710.635	125			

a. R Squared = .767 (Adjusted R Squared = .761)

Table 4.11 shows the F-calculated value 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 calculated F-value was 32.762 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 significant difference in the mean interest scores of general woodwork students taught with basic podcast instructional method and those taught using vodcast instructional method

4.12 Hypothesis 6

H_{O6}: There is no significance difference in the mean scores of high, medium and low ability level student's retention in general woodwork when taught using basic podcast and vodcast instructional methods.

The data analysis for Hypothesis six is shown in table 4.12

Table 4.12

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	36074.287[a]	3	12024.762	688.353	.000
Intercept	865.446	1	865.446	49.542	.000
Postt	2316.855	1	2316.855	132.627	.000
Ability	828.492	2	414.246	23.713	.000
Error	2131.205	122	17.469		
Total	484158.000	126			
Corrected Total	38205.492	125			

a. R Squared = .944 (Adjusted R Squared = .943)

Table 4.12 shows the F-calculated value for testing the significance difference between the high, medium and low retention scores of students taught general woodwork using Basic podcast and vodcast teaching methods. The calculated F-value was 23.713 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 significant difference in the mean retention scores of general woodwork students taught with basic podcast instructional method and those taught using vodcast instructional method

4.13 Findings of the Study

1 Basic podcast and vodcast method were effective in improving students' achievement in GWW but vodcast is more effective on students' achievement in GWW than Basic podcast method.

2 There was an effect of interest on the achievement of students taught GWW with basic podcast and vodcast but vodcast was more effective than basic podcast.

3 Basic podcast and vodcast method are effective in improving students' academic retention in GWW but vodcast is more effective on students' academic retention in GWW than Basic podcast method.

4 There was effect of ability level on the achievement of students taught general woodwork using basic podcast and vodcast instructional method but vodcast method was more effective.

5 There was effect of ability level on the interest of students taught general woodwork using basic podcast and vodcast instructional method but vodcast method was more effective.

6 There was effect of ability level on the retention of students taught general woodwork using basic podcast and vodcast instructional method but vodcast method was more effective

7 There was significant difference between the mean achievement score of students taught general woodwork using basic podcast and vodcast instructional methods

8 There was significant difference between the mean interest score of student's taught general woodwork using basic podcast and vodcast instructional methods.

9 There was significant difference between the mean retention scores of students taught general woodwork using basic podcast and vodcast instructional methods.

10 There was significant difference in the mean achievement score of high, medium, and low ability students taught general woodwork using basic podcast and vodcast instructional methods.

11 There was significant difference in the mean interest score of high, medium, and low ability students taught general woodwork using basic podcast and vodcast instructional methods.

12 There was significant difference in the mean retention score of high, medium, and low ability students taught general woodwork using basic podcast and vodcast instructional methods.

4.14 Discussion of Findings

The findings on the effect of Basic podcast and vodcast instructional methods on students' achievement scores in general woodwork as contained in the data presented in table 4.1 on research question one 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 is in line with the results of Lowman (2019) who reported that exposing students to iPod accessed vodcasts teaching method increases students' achievement than podcast method. Supporting the finding, Stajka (2018) 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 Bimpe, *et al*. (2016) who found out that basic podcast Instructional method increased academic achievement of students' in Biology than those taught with traditional methods of teaching. In addition, Rasi and Poikela (2016) also

discovered that students taught using vodcast are involved in solving problems and help to promotes 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 a master of his/her task.

The findings of this study is also in conformity with the findings of Taslibeyaz *et al.* (2017) who reported that watching videos was beneficial for gaining clinical skills, changing attitudes, encouraging cognitive learning and retaining knowledge. Similarly, Jones, *et al.* (2022) argued that vodcast strategy offer students the advantages of convenience, ubiquity of access, the ability to self-pace, and the ability to repeat content compared to teacher centred method of teaching. The finding of this study accords well with the findings of Munion (2018) who revealed that students' taught with vodcast approach outperform students who used a dictionary-focused approach and traditional approach. This is because vodcast approach is a student centred method of teaching which encourage independent learning and interaction among students.

In the same vein, as contained in the data presented in table 4.7 hypothesis one there was no significant difference between the mean score of basic podcast and vodcast groups in the achievement of students in general woodwork. This is because, F-calculated value (4.164) and p-value of (0.043) for the effect of teaching method on the academic achievement of GWW students taught using basic podcast and those taught with vodcast method is less than 0.05. Therefore, the null hypothesis was rejected. The findings of the study agreed with the study conducted by Nwachokor, *et al*. (2019) which revealed that students in the study agreed 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 findings on student's interest based on the use of basic podcast and vodcast instructional methods in teaching general woodwork as contained in the data presented in table 4.2 on research question two shows significant increase on their interest in learning GWW with vodcast group having the highest interest score. This is because, F-calculated value (5.779) and p-value of (0.018) which is less than 0.005.Therefore, the null hypotheses that stated there is no significant difference between the mean Interest scores of high, medium and low ability level General Woodwork students taught using Basic podcast and Vodcast Instructional Method is accepted. This implies that the two teaching techniques are effective in enhancing student's interest in studying general woodwork.

The result of the findings is in agreement with the findings of Nwaodo (2020) who stated that interest is the attraction, which forces or compels a child to respond to a particular stimulus. A child develops interest if a particular stimulus (e.g. teaching method or school subject) is attractive and arousing or stimulating. This implies that the influence of vodcast instructional method has stimulate the interest of the students hence making them have better understanding and seek to improve their ability in the subject area. The study also agreed with the view of Sauer (2018) whose study result revealed that students performed better on tasks that piqued their interests. This means that for

general woodwork student's to have high achievement vodcast teaching method has increase their interest on the subject. The study is also in line with Paul (2018) who observed that interest can help us think more clearly, understand more deeply, and remember more accurately. Interest has the power to transform struggling performers, and lift high achievers to a new plane. Since vodcast method aroused the interest in general woodwork, this will help the students to understand more deeply and more accurately and improve their academic performance. Also, Kpolovie, *et al*. (2019) argue that improvement of student's interest in learning and attitude to school could contribute in enhancing their performance academically. These has clearly shown that vodcast instructional method is capable of improving students interest in general woodwork and other trade subjects offered in technical and vocational colleges.

The findings on student retention based on the use of basic podcast and vodcast instructional methods in teaching general woodwork as contained in the data presented in table 4.3 on research question three revealed significant increase where they retained to a great extent what they have been taught but students taught general woodwork with vodcast method retained their learning better than students taught with basic podcast. Therefore, it can be concluded that the use of vodcast instructional method in enhancing student retention in GWW is most effective than basic podcast instructional method, because the mean gain of students taught with vodcast teaching method is greater than students taught with basic podcast teaching method. Equally, the findings on the test of significant difference between the student retention based on the use of basic podcast and vodcast instructional methods in teaching GWW as shown in the data presented on table 4.9 hypothesis three revealed that there is significant difference in favour of vodcast group. This is because, F-calculated value (13.317) and p-value of (0.000) for the effect of teaching method on the academic retention of GWW students taught using

basic podcast and those taught with vodcast method is less than 0.05. The null hypothesis was rejected. Clearly, the different treatment students were subjected to form the foundation for the significant difference in the student's retention.

The findings of this study is in conformity with the findings of Munion (2018) who revealed that students who were taught using vodcast teaching method obtained higher retention mean scores in the retention test compare with those taught using traditional method. This finding agreed with the results of Nwachokor, *et al*. (2019) which shows that vodcast techniques increases students' productivity, promote creativity and facilitate academic learning. This is because; there is little differences in the treatment that student in vodcast group received. The vodcast process in the treatment group required students to watch, study and learn the assigned task by creating their own vodcast interact with other students where they help each other to learn their assigned task and become more knowledgeable on it. Therefore, students were able to retain knowledge by repeatedly watching, listening and interacting with pears. Though, the two teaching methods are effective in teaching GWW in technical colleges but vodcast teaching method is more effective.

However, the finding is similar with the findings of Nesrin and Yasemin (2018) which results of their study shown that there was a significant difference in the mean scores of students exposed to video podcast compared to those using the CD method. The finding of this study is similar to the findings of Taslibeyaz *et al.* (2017) whose study revealed that in the context of medical education watching videos was beneficial for gaining clinical skills, changing attitudes, encouraging cognitive learning and retaining knowledge. These show that vodcast teaching technique has effective and high retention ability on students learning outcome. It enhanced students' to study better since they are involved in the learning process.

The results presented on the effect of ability level of high, medium and low students' achievement when taught using basic podcast and vodcast teaching methods as contained in the data presented in table 4.4 on research question four 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 was compared. The difference between the mean gains of high, medium and low ability student's in basic podcast and vodcast group was (26.232). It is an indication that basic podcast and vodcast instructional methods are effective in improving the academic achievement of high, medium and low ability students of general woodwork in technical colleges. The findings of this study agree with the findings of Abakpa and Iji (2019) who opined that there is a positive correlation between good teaching approach and students' achievement at all levels in mathematics. Similarly, this study is in agreement with the study of Adeyemo (2020) 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 GWW in technical colleges to improve academic achievement of high, medium and low ability level students' but vodcast is more effective.

The findings on the test of significant difference between the mean interest scores of high, medium and low ability general woodwork students taught using basic podcast and vodcast methods revealed that no significant difference between the mean interest score of high, medium, and low ability students. This is because, F-calculated value (32.762) and p-value of (0.000) for the effect of teaching method on the interest of high, medium and low ability students of GWW taught using basic podcast and those taught with vodcast is less than 0.05. Therefore, null hypothesis was rejected. The finding is in

line with the study of Abakpa and Iji (2019) reported that there is a positive correlation between good teaching approach and students' achievement at all levels. This means that interest is essential in enhancing the academic achievement of students. The study also agree with Paul (2018) who reported that interest can help us think more clearly, understand more deeply, and remember more accurately. Interest has the power to transform struggling performers, and lift high achievers to a new plane. Likewise, the study also support Kpolovie, *et al*. (2019) whose study revealed that improvement of student's interest in learning and attitude to school could contribute in enhancing their performance academically. Basically, this implies that interest is an important factor that can foster learning and significantly improve students' performance.

The results presented on the effect of ability level on students' retention mean score revealed that there was significant increase across high, medium and low ability students taught with basic podcast and vodcast instructional techniques as contained in the data presented in table 4.6 research question six. The difference between the mean gain of high medium and low ability students was (89.20). This revealed that the teaching methods are effective in improving high, medium and low level students' retention ability in GWW. The students all performed better because they were exposed to teaching methods that provided them with the opportunity to work independently and allow them to create and share their finding with others by constant explanation as provided in basic podcast and vodcast methods thereby allowed them retain better across the groups. As supported by Adegoke (2020) whose study revealed that there are no statistically significant differences among the high, medium, and low ability students when exposed to Animation with Narration (AN) multimedia instructional package. This study is in agreement with the study of Nwachokor, *et al*. (2019) which revealed that students in the study agreed that vodcast and basic podcast increase productivity

promote creativity and facilitate academic learning. Likewise the study agree with Abakpa and Iji (2019) who's study shows that there is a positive correlation between good teaching approach and students' achievement at all levels in mathematics.This recommends that when teachers use the right teaching methods, both high, medium and low students would learn better. It can also be concluded that basic podcast and vodcast method help to bridge the gap in GWW academic retention between high, medium and low ability level students.

The findings on the test of significant difference between the students retention based on ability level revealed that there is no statistical significant difference between the retention mean score of high, medium and low level students taught GWW using basic podcast teaching method and those taught with vodcast methods in favour of vodcast groups. This is because, F-calculated value (23.713) and p-value of (0.000) and the null hypotheses was rejected since the p-value is less than 0.05.The possible reason behind the insignificant difference is as a result of the instructional methods because basic podcast and vodcast method allows the students to listen, view, interact and facilitate self-pace learning as well provide the learner opportunity to retain and provide positive feedback. As supported by Iji and Harbor-peters (2018) stated that instruction can be organised in such a way and manner that all students in the class can achieve at a high level. The finding is in line with Nwachokor, *et al*. (2019) who revealed that vodcast and basic podcast significantly increase students' productivity, promote creativity and facilitate academic learning. This recommends that when teachers use the right teaching methods, high, medium and low ability students would learn better. It can also be concluded that basic podcast and vodcast teaching methods help to bridge the gap in GWW academic retention between high, medium and low ability students.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

General woodwork is an essential tool that could make the students more productive in economic sector, occupational and development of the nation. This has resulted into the need to verify the appropriate instructional methods such as basic podcast and vodcast that can enhance student's achievement, interest and retention in general woodwork. In search for the appropriate student centred method of teaching and learning general woodwork that could enhance the cognitive achievement or interlectual ability of the students' toward the acquisition of appropriate work skills ability and competency. The researcher has found basic podcast and vodcast instructional methods as effective and could be used in teaching general woodwork technical and vocational colleges.

The result of the study revealed that basic podcast and vodcast are both suitable teaching method that can be used to improve students' academic achievement, interest, ability level and retention. The study further revealed that vodcast teaching method is more effective in enhancing students' academic achievement, interest, ability level and retention of knowledge in GWW than basic podcast method. In addition, basic podcast and vodcast methods have the ability to improve student's involvement in teaching and learning activities inside and outside the classroom. Also, the study has provided GWW teachers with a teaching lesson plan that can be used or adapted to teach GWW module using basic podcast and vodcast instructional methods, as one of the contributions to knowledge.

5.2 Recommendations

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

1. Woodwork teachers should adopt vodcast instructional method to teach students at technical colleges to enhance student's academic achievements and retention in GWW.
2. Regular workshop and seminar should be organized for woodwork teachers by Federal and State Ministries of Education on the needs for the teachers to use vodcast instructional method.
3. Federal Ministry of Education and curriculum developer should incorporate vodcast instructional method in their future curriculum design for enhanced students" academic achievement and retention in General woodwork.
4. Students should be exposed to the use of vodcast method to enhance their interest in learning general woodwork as they all show interest in the teaching method.

5.3 Suggestions for Further Research

Based on the findings of this study and their educational implications, the following suggestions were made for further research:

1. Effects of basic podcast and vodcast instructional method on students' achievement and retention in general woodwork at technical colleges should be carried out in other location in Nigeria.
2. Effect of vodcast and other multimedia instructional method on students' achievement and retention in general woodwork at technical colleges should be carried out.

3. Effects of basic podcast and vodcast instructional method on students' achievement, retention and ability level in general woodwork at technical colleges should be carried out in other trades subjects in Nigeria.

5.4 Contribution to Knowledge

This research work has contributed immensely to knowledge in view of the current challenges confronting the nation's technical colleges with respect to teaching methods. Consequent upon this therefore, this study has filled the gap in the teachers centred method adopted in teaching students in technical colleges and has shifted to students centred method that could enhance achievement, interest and retention scores by introducing basic podcast and vodcast instructional methods which is based on the principles that enable students to study independently, search and construct their knowledge, master the subject and become self-reliant.

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APPENDIX A

BASIC PODCAST INSTRUCTIONAL METHOD

LESSON 1

Subject: General Woodwork

Topic: Timber Preparation

Class: Technical College Two (TC II)

Duration: 45minutes

Previous Knowledge: Students have been taught hand tools Safety

Behavioural Objective: At the end of the lesson, students should be able to;

(1) Select and use hand tools and machines to prepare timber to finished size

(2) Describe the correct sequence for preparing a timber

(3) State the precautions to be taken when using hand tools and machines in preparation of timber

Entry Behaviour: Students can describe safe ways of carrying, storing and using hand tools

Teaching Aids: Unplanned timber, hand tools and machines

Instructional Procedure

Content	Teacher Activity	Student Activity	Strategy
Presentation Step one	Record list of hand tools and machine tools use for preparation of timber and present it via, basic podcast	Download listen and take note of the tools	Study independently
Presentation Step two	Records and presents to the students sequence of timber preparation and explain step-by-step procedure on how to prepare a piece of timber to finished sizes and disseminate via basic podcast	Listen and take note of the procedure as demonstrated by the teacher	Study independently

Presentation Step three	Records and presents to students emphasis on observing safety precaution in the use of hand tool and machines	Listen, and take note of what the teacher emphasis about safety precautions	Learn independently
Presentation Step three	Assigns sawing and planning activity for the students to carry out	Download and carried out the process of sawing and planning activity using hand tools and machines observing the necessary safety precaution and present it to the teacher	Students are divided into groups to carry out the operation
Evaluation	Ask students to; Describe the correct sequence of timber preparation List five hand tools and two machines used in preparation of timber	Download, listen and answer questions.	Students respond individualy
Assignment	Presents his question by asking students to Define wood Joint? State 3 classification of joint Mention 3 types of joints from each class of joint	Download the assignment, work on it at home and submit to the teacher as scheduled	Students work indepently or by interacting with peers

BASIC PODCAST INSTRUCTIONAL METHOD
LESSON 2

Subject: General Woodwork

Topic: Woodwork joints

Class: Technical College Two (TC II)

Duration: 45minutes

Previous Knowledge: Students have learned Timber preparation

Behavioural Objective: At the end of the lesson, students should be able to;

(1) Describe woodwork joint, types, classification and practical use of joints

(2) Illustrate good sketching technique of woodwork joints

(3) Demonstrate correct use of hand tools and machines in making woodwork joint

(4) Construct and assemble woodwork joints

Entry Behaviour: Students can carry out timber preparation

Teaching Aids: Using chart, hand tools, machines and timber

Instructional Procedure

Content	**Teacher Activity**	**Students Activity**	**Strategy**
Presentation Step one	Describe woodwork joints, types and classification and present it via podcast	Download, play, listen and take note of what the teacher explains	Self learning
Presentation Step two	Record as he describes woodwork joints and their uses	Download, play, and take note of what the teacher is explaining on woodwork joints and their uses	Study inpendently
Presentation Step Three	Explain the correct use of hand tools and machines for construction of woodwork joints	Listen and take note of what the teacher is demonstrating	Students leran individually or by interacting with peers

Presentation Step Four	Assign students to construct and assemble woodwork joints	Record their own process of constructing and assembling woodwork joints demonstrating correct use of hand tools and machines and present to the teacher via podcast	Students work indepently or by interacting with peers
Evaluation	Asks students to; • Describe woodwork joints? • Mention three classes of woodwork joints • Mention three types of joints from each class above	Students download, listen and answer questions	Students respond individually
Assignment	Asks students to; • Sketch five woodwork joints • Construct two types of woodwork joints	download the assignment, record as they work on it and submit as scheduled	Students work in groups and share ideas among themselves

BASIC PODCAST INSTRUCTIONAL METHOD

LESSON 3

Subject: General Woodwork

Topic: Woodwork Adhesives

Class: Technical College Two (TC II)

Duration: 45minutes

Previous Knowledge: Students can construct woodwork joints

Behavioural Objective: At the end of the lesson, students should be able to;

(1) Describe woodwork Adhesives

(2) Name, classify and state the characteristics of wood adhesives

(3) Select and prepare adhesives for use

(4) Define gluing terms

Entry Behaviour: Students can name, identify and classify woodwork joints

Teaching Aids: Using samples of various types of wood adhesives

Instructional Procedure

Content	**Teacher Activity**	**Students Activity**	**Strategy**
Presentation Step one	Record lesson, define wood adhesives and explain their uses	Listen to the teacher, note dawn and ask question for clarification	Self learning
Presentation Step Two	Name the various types of wood adhesives	Listen to the teachers explanation, note download and ask question for clarification	Study independently
Presentation Step Three	Describes the properties, uses and methods of preparing adhesives	Listen to the teachers explanation, note down and ask question for	Learn independently

		clarification	
Presentation Step Four	Explains the gluing terms	Take note of what the teacher explains	Study independently
Evaluation	Asks question as;) Name five characteristics of wood adhesives?) Explain the gluing terms Pot life) Shelf life Assembling term	Answer questions at the end of lesson	Respond individually
Assignment	Asks students to;) Name and state the uses of five different types of wood fittings	Write the assignment, work on it and submit as scheduled	Work individually

BASIC PODCAST INSTRUCTIONAL METHOD

LESSON 4

Subject: General Woodwork

Topic: Wood Fittings

Class: Technical College Two (TC II)

Duration: 45minutes

Previous Knowledge: Students have been taught how to prepare and use wood Adhesives

Behavioural Objective: At the end of the lesson, students should be able to;

(1) Identify, name and state the uses of different types of wood fittings

(2) Select and use suitable fittings

(3) Sketch fittings and label their parts

Entry Behaviour: Students can name, classify and state the uses of wood Adhesives

Teaching Aids: Using samples of various types of wood fittings

Instructional Procedure

Content	Teacher Activity	Students Activity	Strategy
Presentation Step one	Names various types of fittings and upload via basic podcast	Download, listen and take note	Study independently
Presentation Step two	Describes the uses of each type of wood fittings via podcast	Download listen and take note the various types of fittings and state their uses	Self learning
Presentation Step three	Selects and explain the uses of the fittings to the students via podcast	Download listen and take note of what the teacher is demonstrating and apply it to similar problem	Self learning

Evaluation	Asks students questions via podcast to Name five wood fitting and state their uses? Fix butt hinges to two piece of wood	Answer questions and perform the task assigned by the teacher and present it via podcast	Respond individually
Assignment	Asks students to sketch and label five different types of wood fittings	Download assignment, work on it at home and submit as scheduled.	Work individually or by interacting with peers

BASIC PODCAST INSTRUCTIONAL METHOD

LESSON 5

Subject: General Woodwork

Topic: Finishes and Finshing

Class: Technical College Two (TC II)

Duration: 45minutes

Previous Knowledge: Students have been taught wood fittings

Behavioural Objective: At the end of the lesson, students should be able to;

(1) Identify and state the uses of different wood finishes

(2) State purpose of applying wood finishes

(3) Name tools equipments and materials for applying finishing

(4) State properties of wood finishes

(5) Prepare surface for wood finishing and

(6) Apply finishes to wood surface

Entry Behaviour: Students can describe various types of wood fittings and their uses.

Teaching Aids: Using charts and various types of wood finishes, hand brush and glass paper.

Instructional Procedure

Content	Teacher Activity	Students Activity	Strategy
Presentation step one	Record lesson and presents it via podcast to the students explaining the term finishes and finishing and list types of finishes	Download, listen and take note of what the teacher explained about the term finishe, finishing and list of finishes	Learn independently
Presentation Step Two	Records lesson explaining purpose of applying wood finshing	Listen and take note of the purpose as explain by the teacher	Study independently

Presentation Step Three	Name tools, equipment and materials use for applying wood finshing	Download, play and listing to the list of tools, equipment and materials use for applying wood finshing listed by the teacher	Study individually
Presentation Step Four	State properties of wood finishes	Students listen and take not of the properties as explained by the teacher	Study independently or by interacting with peers
Presentation step Five	Explain how to prepare wood wood surface for finishing	Listen and take note of the procedure	Study independently or by interacting with peers
Presentation step Six	Explain how to apply finishing to the prepared surface	Listen and take note of the procedure	Learn independently
Evaluation	Asked students to (1) list five (5) types of wood finishes (2) State three reasons for applying finishing (3) Mention two method of applying wood finishing	Answer questions by creating their own basic podcast at the end of the lesson and send answer to the teacher as feedback	Respond individually
Assignment	Records assignment, asking students to state the sequence involve in preparing surface for finishing	Download the assignment, work on it at home and submit via basic podcastas scheduled	Work individually

Appendix B

VODCAST INSTRUCTIONAL METHOD

LESSON 1

Subject: General Woodwork

Topic: Timber Preparation

Class: Technical College Two (TC II)

Duration: 45minutes

Previous Knowledge: Students have been taught hand tools Safety

Behavioural Objective: At the end of the lesson, students should be able to;

(1) Select and use hand tools and machines to prepare timber to finished siz

(2) Describe the correct sequence for preparing a timber

(3) State the precautions to be taken when using hand tools and machines in preparation timber

Entry Behaviour: Students can describe safe ways of carrying, storing and using hand tools

Teaching Aids: Unplanned timber, hand tools and machines

Instructional Procedure

Content	Teacher Activity	Student Activity	Strategy
Presentation Step one	Record list of hand tools and machine tools use for preparation of timber	Download, listen and take note of the tools	Study independently
Presentation Step two	Record lesson listing out the sequence of timber preparation and demonstrate step-by-step how to prepare timber to finished sizes	Students download observe, listen and take note of what the teacher is demonstrating	Study independently or by interacting with peers
Presentation	Records and presents to students emphasis on observing safety precaution	Students listen, observe and take note of what the teacher emphasis about	Learn independently

Step three	on the use of hand tool and machines	safety precaution	
Presentation Step four	Assign students to saw and plane a piece of timber size	Carry out sawing and planning activity using hand tools and machines observing the necessary safety precaution	Studente are group to carry out the task
Evaluation	Asks students to (1) Describe the correct sequence of timber preparation (2) List five hand tools and two machines used in preparation of timber	Answer question at the end of the lesson	Respond individually
Assignment	Presents his question by asking students to (1) Define wood Joint? (2) State 3 classification of joint (3) Mention 3 types of joints from each class of joint	Write dawn the assignment work on it at home and submit as scheduled	Work independently

VODCAST INSTRUCTIONAL METHOD

LESSON 2

Subject: General Woodwork

Topic: Woodwork joint

Class: Technical College Two (TC II)

Duration: 45minutes

Previous Knowledge: Students have been taught Timber preparation

Behavioural Objective: At the end of the lesson, students should be able to;

(1) Describe woodwork joints, types, classification and practical use of joints

(2) Illustrate good sketching technique of woodwork joints

(3) Demonstrate correct use of hand tools and machine in making woodwork joint

(4) Construct and assemble woodwork joints

Entry Behaviour: Students can describe sequence in timber preparation

Teaching Aids: Using various hand tools, machines and timber

Instructional Procedure

Content	Teacher Activity	Students Activity	Strategy
Presentation step one	Record the lesson, describes woodwork joints, types and classification	Download, observe, listen and note dawn what the teacher is explaining.	Study independently
Presentation Step two	Describes woodwork joints and their uses, using sketches on the board for students	Observe and take note of what the teacher is sketching on the board	Learn independently
Presentation Step three	Demonstrate the correct use of hand tools and machines for constructing woodwork joints	Observe, listen and take note of what the teacher is demonstrating	Self learning
Presentation Step four	Engage students in constructing and assembling of woodwork joints	Construct and assemble woodwork joints demonstrating correct use of hand tools and machines	Students are group to carry out the task

Evaluation	Asks students to; (1) Describe woodwork joint (2) Mention three classes of woodwork joints (3) Mention three types of joints in each class above	Respond by answering question at the end of the lesson	Respond individually
Assignment	Teacher asks students to; (1) Sketch five woodwork joints (2) Construct two types of woodwork joints	Write dawn the assignment Work on it and submit as scheduled	Students are group to perform the job

VODCAST INSTRUCTIONAL METHOD

LESSON 3

Subject: General Woodwork

Topic: Woodwork Adhesives

Class: Technical College Two (TC II)

Duration: 45minutes

Previous Knowledge: Students can construct woodwork joints

Behavioural Objective: At the end of the lesson, students should be able to;

(1) Describe woodwork Adhesives

(2) Name, classify and state the characteristics of wood adhesives

(3) Select and prepare adhesives for use

(4) Define gluing terms

Entry Behaviour: Students can name, identify and classify woodwork joints

Teaching Aids: Various types of wood adhesives

Instructional Procedure

Content	Teacher Activity	Students Activity	Strategy
Presentation Step one	Defines wood adhesives and explains its uses presenting it via vodcast	Watch video, listen and ask questions for clarification	Learn independently
Presentation Step two	Record names and various types of wood adhesives and display it via vodcast	Download, observe and listen to the teachers explanation, note dawn and ask questions for clarification	Study independently

Presentation Step three	Describes the properties, uses and methods of preparing adhesives and present it via vodcast	Observe and listen to the teacher's explanation, note dawn and ask questions for clarification	Study independently
Presentation Step four	Explains the gluing terms and present it via vodcast	Download listen and take note of the gluing terms	Learn independently
Evaluation	Asks students questions via vodcast as; (1) Name five characteristics of wood adhesives? (2) Explain the gluing terms (a) Pot life (b) Shelf life (c) Assembling term	Download, listen and answer questions	Respond individually
Assignment	Asks students question via vodcast to; Name and state the uses of five different types of wood fittings	Download the assignment work on it and submit as scheduled	Work individually

VODCAST INSTRUCTIONAL METHOD

LESSON 4

Subject: General Woodwork

Topic: Wood Fittings

Class: Technical College Two (TC II)

Duration: 45minutes

Previous Knowledge: Students have been taught how to prepare and use wood Adhesives

Behavioural Objective: At the end of the lesson, students should be able to;

(1) Identify, name and state the uses of different types of wood fittings

(2) Select and use suitable fitting

(3) Sketch fittings and label their parts

Entry Behaviour: Students can name, classify and state the uses of wood Adhesives

Teaching Aids: Using play card with various types of wood fittings

Instructional Procedure

Content	**Teacher Activity**	**Students Activity**	**Strategy**
Presentation Step one	Records the lesson displaying the various types of fittings.	Observe and take note	Study individually
Presentation Step two	Describes the uses of each type of wood fittings.	Examine and identify various types of fittings and state their uses	Learn independently
Presentation Step three	Selects and demonstrates the uses of the fittings.	Students observe and take note of what the teacher is demonstrating	Learn independently

Presentation Step four	Demonstrates correct sketching and labeling techniques.	Students make sketches of wood fittings and label their parts	Self learning
Evaluation	Asks questions as (1) Name five wood fitting and state their uses (2) Fix butt hinges to two piece of wood	Answer questions and perform the task assigned by the teacher	Respond individually
Assignment	Asks students to sketch and label five different types of wood fittings.	Take note, work on the assignment at home and submit as scheduled	Work independently

VODCAST INSTRUCTIONAL METHOD

LESSON 5

Subject: General Woodwork

Topic: Finishes and Finshing

Class: Technical College Two (TC II)

Duration: 45minutes

Previous Knowledge: Students have been taught wood fittings

Behavioural Objective: At the end of the lesson, students should be able to;

(1) Identify and state the uses of different wood finishes
(2) State purpose of applying wood finishes
(3) Name tools equipments and materials for applying finishing
(4) State properties of wood finishes
(5) Prepare surface for wood finishing and
(6) Apply finishes to wood surface

Entry Behaviour: Students can describe various types of wood fittings and their uses.

Teaching Aids: Using charts and various types of wood finishes, hand brush and glass paper.

Instructional Procedure

Content	Teacher Activity	Students Activity	Strategy
Presentation step one	Record lesson and presents it via vodcast to the students explaining the term finishes and finishing and list types of finishes	Download, watch, listen and take note of what the teacher explained about the term finishes, finishing and list of finishes	Study the lesson independently
Presentation Step Two	Records lesson explaining purpose of applying wood finshing	Watch, listen and take note of the purpose as explain by the teacher	Study independently

Presentation Step Three	Name tools, equipment and materials use for applying wood finshing	Download, watch and listing to the list of tools, equipment and materials use for applying wood finshing listed by the teacher	Study independently
Presentation Step Four	State properties of wood finishes	Students listen and take not of the properties as explained by the teacher	Learn independently
Presentation step Five	Demonstrate how to prepare wood wood surface for finishing	Watch, listen and take note of the procedure	Study independently and interacting with peers
Presentation step Six	Explain how to apply finishing to the prepared surface	Watch, listen and take note of the procedure	Study independently
Evaluation	Asked students to (4) list five (5) types of wood finishes (5) State three reasons for applying finishing (6) Mention two method of applying wood finishing	Answer questions by creating their own basic podcast at the end of the lesson and send answer to the teacher as feedback	Work independently
Assignment	Records assignment, asking students to state the sequence involve in preparing surface for finishing	Download the assignment, work on it at home and submit via basic podcastas scheduled	Work independently

APPENDIX C

GENERAL WOODWORK ACHIEVEMENT AND RETENTION TEST

1. The appropriate joint for use between the side and the shelf is
   A. Stopped housing joint.
   B. Stub mortise and tenon joint.
   C. T- bridle joint.
   D. Corner- bridle joint.
2. The type of joint used to fix drawer sides to the front is
   A. Mortise and tenon joint.
   B. Bridle joint.
   C. Lap dovetail joint.
   D. Through dovetail joint.
3. Finishes are applied to wood surface for the following reasons except
   A. Decorative
   B. Strength
   C. Protective
   D. Hygienic
4. Which of the following joint is used to increase the width of a board
   A. Bridle joint.
   B. Tenon joint.
   C. Dovetail joint.
   D. Tongue and groove joint.
5. The material used for filling nail holes and cracks before priming is called
   A. Lacquer
   B. Putty
   C. Paint
   D. Abrasive
6. The material use for providing smooth surface before the application of finishes is called
   A. Abrasive
   B. Enamel
   C. Router
   D. Smoother

7. The most suitable joint for stool construction is called

   A. Butt joint.

   B. Housing joint.

   C. Mitre joint.

   D. Mortise and tenon joint.

8. The type of joint use for fixing together pieces which have their face at right angle and edge flush is called
   A. Angled joint
   A. Framing joint
   B. Widening joint
   C. Cramping joint
9. The glue made from soya beans after the extraction of oil is called
   A. Blood albumin
   B. Casein glue
   C. Vegetable glue
   D. Urea Adhesives
10. The substance used to bond two surfaces together is called

    A. Gum.

    B. Adhesive.

    C. Abrasive.

    D. Finishes.

11. The best adhesive for bonding plastic materials is

    A. Contact adhesive.

    B. Animal glue.

    C. Casein glue.

    D. Phenol formaldehyde.

12. The term applied to the process of coating or polishing the surface of wood is called
    A. Seasoning
    B. Polishing
    C. Finishing
    D. Preservation
13. Castors are example of wood fittings that

    A. Provide security
    B. Penetrate timber
    C. Permit movement

D. Assembled timber

14. The end of each piece in a mitre joint is commonly cut at an angle of

A. 30^0 or 60^0

B. 45^0

C. 90^0

D. 120^0

15. The marks indicated in the diagram below represent the

A. Face side

B. Face edge.

C. Side end.

D. Side edge.

16. Which of the tools below is specifically used for marking out and testing lines at 45?

A. Try square.

B. Mitre square.

C. Sliding bevel.

D. Vanier caliper.

17. The instrument for testing the flatness and squareness when preparing a piece of timber is called?

A. Mitre squre.

B. Trammel.

C. Straight edge.

D. Try square.

18. Which of the following tool is used to plane the rough surface of wood?

A. Smoothing plane.

B. Jack plane.

C. Rebate plane.

D. Trying plane.

19. A stool that will require frequent cleaning is better finished with

    A. Lacquer
    B. Wax
    C. Sealer
    D. Oil

20. Which of these joints is not an angle joint?

    A. Dovetail joint
    B. Halving joint
    C. Plain mitred
    D. Housing joint

21. Woodwork joints are classified into

    A. Three
    B. Four
    C. Five
    D. Two

22. Which of the following symbols is a face-edge mark on a prepared wood piece?

    A. α
    B. ɣ
    C. λ
    D. ν

23. The following are characteristic of animal glue except

    A. It makes a good strong joint
    B. It must be use hot and the work assembled immediately
    C. It is for internal use
    D. It must be cold

24. Which of the following is not a wood fitting

    A. Screw
    B. Mallet
    C. Hinges
    D. Catches

25. Which of the following fitting permit movement?

    A. Bolts

B. Handles

C. Hinges

D. Screws

26. The hinges that is used for table tops and step ladders is called

A. Back flap hinges

B. Strap hinges

C. Tee hinges

D. Butt hinges

27. The following are sequence of timber preparation except

A. Assembling

B. Plane the face-side

C. Plane the face-edge

D. Mark out for the width

28. The following tools are used in preparing timber to finished size except

A. Plane

B. Try square

C. Saw

D. Ratchet brace

29. The length of time the glue remains usable after mixing is called?

A. Pot life

B. Shelf life

C. Assembling time

D. Setting time

30. The time glue takes to attain it maximum strength after being applied to a job is called?

A. Cramping time

B. Mixing time

C. Assembling time

D. Setting time

31. Animal glue is sometimes called?

A. Casein glue

B. Hide glue

C. Blood albumin

D. Soya beans

32. The widening joint use for joining greasy timber which does not glue easily is called?

A. Butt joint

B. Secret slot screw joint

C. Rebated joint

D. Cramped joint

33. …….. is formed when two or more piece of wood are joint together at right angle to each other

A. Angle

B. Frame

C. Joint

D. Carcase

34. The part of a hinge which is fastened together by a pin is called?

A. Wing

B. Knuckles

C. Leaves

D. Gates

35. …….. is a manual method of applying finishing

A. Spraying

B. Brushing

C. Rolling

D. Painting

36. The following are types of wood finishes except

A. Vanishes

B. Lacquer

C. Oil

D. Solvent

37. The full meaning of the acronym F.E.W.T.E.L is

A. Face edge, Face side, Width, Time, End, Length

B. Face edge, Face end, Width, Time, End, Length

C. Face edge, Face side, Width, Time, End, Length

D. Face side, Face edge, width, Thickness, End, Length

38. Adhesives are used in wood industries for the following purpose except
    A. Binding metal to wood
    B. Plywood production
    C. Veneering
    D. Fixing of wood joint permanently
39. Box lock are example of cabinet fittings that
    A. Provide security
    B. Permit movement
    C. Penetrate timber
    D. Preserved timber
40. The protection of wood surface with different finishing material is called

    A. Conversion
    B. Preservation
    C. Brushing
    D. Seasoning

APPENDIX D

Answer to General woodwork Achievement and Retention Test

(GWWART)

1. A
2. C
3. B
4. D
5. B
6. A
7. D
8. A
9. C
10. B
11. A
12. C
13. C
14. B
15. A
16. B
17. D
18. B
19. D
20. B
21. A
22. C
23. D
24. B
25. C
26. A
27. A
28. D
29. A
30. D
31. B
32. B
33. C
34. B
35. B
36. D
37. D
38. A
39. A
40. B

APPENDIX E
GENERAL WOODWORK ACHIEVEMENT AND RETENTION TEST
ANSWER SHEETS

Name of School _____
Class: _____

S/N	A	B	C	D
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				

S/N	A	B	C	D
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
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30.				
31.				
32.				
33.				
34.				
35.				
36.				
37.				
38.				
39.				
40.				

APPENDIX F
GENERAL WOODWORK INTEREST INVENTORY SCALE
(GWWIIS)

Introduction: Read each item carefully and think about how you feel about each item. Tick (√) the appropriate response in the columns provided that best describes your feelings.

Respondent Bio- Data:

Name of school……
Age……
Class……..

Interest Questionnaire

Key:

S A - Strongly Agreed = 5 point
A - Agreed = 4 point
U D – Undecided = 3 point
D - Disagreed = 2 point
S D – Strongly Disagreed = 1 point

S/NO	Statement	SA	A	UD	D	SD
1.	I enjoy studying General woodwork in the school					
2.	I like the way General woodwork is taught					
3.	General woodwork is dull and boring					
4.	I find it easy studying General woodwork					
5.	General woodwork makes me usually feel on easy and confused					
6.	I don't understand the way General woodwork is taught					
7.	I would not study General woodwork in higher institution					
8.	General woodwork is an important trade to study					
9.	I want to develop my practical skills in General woodwork					
10.	I have feeling of dislike for General woodwork					
11.	I can do fairly well in General woodwork test					
12.	I preferred General woodwork practical class than essay class					
13.	I am not confortable studying General woodwork					
14.	Studying General woodwork makes me feel nervous					
15.	I am happier in General woodwork class than any other class					
16.	Studying General woodwork was my choice					
17	In practical class I love to carry out joint construction					
18.	I attend General woodwork class regularly					
19.	The period use for General woodwork practical should be extended from two hours to 5hours					
20.	I like asking questions during General woodwork class					

APPENDIX G

TABLE OF SPECIFICATIONS FOR GWWART

S/N.	Topics	Knowl.	Compre.	Appl.	Anal.	Syn.	Eval.	Total
		75%	5%	7.5%	15%	0%	0%	100%
1.	Timber preparation	6	1	-	1	-	-	8
2.	Woodwork joints	6	-	2	2	-	-	10
3.	Woodwork fittings	6	-	-	-	-	-	6
4.	Wood Adhesives	7	-	1	-	-	-	8
5.	Finishes and Finishing	5	1	-	2	-	-	8
	Total	**30**	**2**	**3**	**5**	**-**	**-**	**40**

APPENDIX H

LETTER OF VALIDATION

Federal University of Technology,

Minna, Niger State.

Department of Industrial and Technology

Education

25th May 2021.

Dear Sir,

REQUEST FOR VALIDATION OF RESEARCH INSTRUMENT

I am a postgraduate student of the Federal University of Technology, Minna Niger State, In the Department of Industrial and Technology Education. I am carrying out a Master research work titled: EFFECT OF BASIC PODCAST AND VODCAST METHOD ON LEARNING OUTCOME ON GENERAL WOODWORK STUDENTS IN TECHNICAL COLLEGES IN NIGER STATE.

I therefore request that you validate the attached instruments.

You are specifically requested to assess and correct the items of their clarity, appropriateness of language and expression to the respective subject of the study General woodwork achievement, interest and retention test (GWWART) is design to measure students' performance in General woodwork trade while General woodwork interest inventory test (GWWIIT) will elicit information regarding the interest of students toward general woodwork taught with basic podcast and vodcast instructional methods, lesson plan on basic podcast and vodcast will be used as a guide in teaching the two experimental groups and basic podcast and vodcast will be used to deliver the lesson to the students.

Please assess and validate these instruments stating your opinion, corrections or recommendations.

Thanks for your anticipated cooperation.

Yours faithfully

Stephen Musa
M.Tech/SSTE/2018/9054
Research Student.

APPENDIX I

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION

RESEARCH INSTRUMENT VALIDATION CERTIFICATE

Student's Name: STEPHEN MUSA

REG.Number: M.TECH/SSTE/2018/9054

Programme: M. TECH.

Topic; Effects of Basic podcast and Vodcast Instructional Method on General Woodwork Students Learning outcomes in Technical Colleges in Niger State.

GENERAL WOODWORK TECHNOLOGY EXPERT

1. General views of the research instrument.

Name of Validator... Prof. R.O. Ukwori
Area of Specialization... Woodwork Technology
Name of Institution... F.U.T. Minna
Signature... Date. 15/06/2021

2. General views of the research instrument.

Name of Validator... Dr. Mohammed, B.M.
Area of Specialization... WOODWORK TECHNOLOGY
Name of Institution... FUT MINNA
Signature... Date. 15/06/2021

3. General views of the research instrument. Satisfactory

Name of Validator... DR HASSAN A.M
Area of Specialization... I.T.E (WOODWORK)
Name of Institution... F.U.T. MINNA
Signature... Date. 11/06/2021

APPENDIX J

KUDER-RICHASON 20 TEST RESULT FOR GENERAL WOODWORK COGNITIVE ACHIEVEMENT AND RETENTION TEST

Case Processing Summary

Notes

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	40	100.0
	Excluded[a]	0	.0
	Total	40	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.775	.780	30

Appendix K
General Woodwork Reliability of Interest Inventory Test

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded[a]	0	.0
	Total	20	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.852	30

APPENDIX L

Classification of Students into High, Medium and LowAbility Level

Group	Basic Podcast			Vodcast		
Ability Level	Number of Students	Scores	Percentage	Number of Students	Scores	Percentage
High	22	70-100	30.55%	14	70-100	25.93
Medium	38	40-69	52.78%	32	40-69	59.26
Low	12	1-39	16.67%	8	1-39	14.81
Total	**72**		**100%**	**54**		**100%**

Appendix M

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA, NIGERIA.

SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION

DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION

Vice Chancellor:
PROF. ABDULLAHI BALA, FSSSN
B. Agric (ABU), M. Sc (Reading), Ph.D (London)

Head of Department:
DR. I. Y. UMAR, MTRCN, MTEPAN.
B. Tech, M.Tech (Minna), Ph.D (SWU-China)
E-mail: umaryakubu@futminna.edu.ng

P.M.B. 65, Minna
Telephone: +2348066059717
E-mail: ite@futminna.edu.ng
Website: www.futminna.edu.ng

Your Ref: _____

Our Ref: _____

Date: 05/08/2021

GOVERNMENT SCIENCE AND
TECHNICAL COLLEGE, GARKI,
ABUJA
.....

Sir/Ma,

TO WHOM IT MAY CONCERN

The bearer STEPHEN MUSA with Registration Number M.Tech/SSTS/2018/9054 is A Master student of Industrial and Technology Education Department.

He is carrying out a research titled: EFFECTS OF BASIC PODCAST AND VODCAST ON STUDENTS LEARNING OUTCOME IN GENERAL WOODWORK IN TECHNICAL COLLEGES ABUJA

He needs your assistance to enable him carry out his field work.

We will appreciate your anticipated co-operation.

Thank you.

05/8/2021

Dr. E. Raymond
Postgraduate Coordinator, ITE.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA, NIGERIA.

SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION

DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION

Vice Chancellor:
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E-mail: umaryakubu@futminna.edu.ng

P.M.B. 65, Minna
Telephone: +2348066059717
E-mail: ite@futminna.edu.ng
Website: www.futminna.edu.ng

Your Ref. _____

Our Ref. _____

Date: 05/08/2021

FEDERAL SCIENCE AND
TECHNICAL COLLEGE OROZO
ABUJA.
.....

Sir/Ma,

TO WHOM IT MAY CONCERN

The bearer STEPHEN MUSA with Registration Number M.Tech/ SSTE/2018/9054 is A Master student of Industrial and Technology Education Department.

He is carrying out a research titled: EFFECTS OF BASIC PODCAST AND VODCAST METHODS ON STUDENTS LEARNING OUTCOMES IN GENERAL WOODWORK IN FCT ABUJA

He needs your assistance to enable him carry out his field work.

We will appreciate your anticipated co-operation.

Thank you.

05/8/2021

Dr. E. Raymond
Postgraduate Coordinator, ITE.

Appendix N

TRAINING MANUAL ON BASIC PODCAST INSTRUCTIONAL METHODS

Purpose of the manual

The purpose of this manual is to assist General woodwork teachers used in this study on how to deliver the learning contents to the students in the classroom using basic podcast instructional methods via projector and Mp3 player and also help the students to download the learning contents on their own personal devices in the topics timber preparation, wood joints, wood adhesives, wood fittings and wood finishes and finishing. The basic podcast instructional methods encourage independent learning, improve learner's academic achievement, transferring of knowledge, improve their communication skill and also help in developing student's skills.

Aim of the manual

The aim of this manual is to ensure uniformity of instruction across the groups when they deliver the topics using basic podcast instructional methods.

ACTIVITIES FOR THE TRAINING

Detail explanation will be given to the teachers about the research work

- ❖ Teachers will be taught what is meant by Podcasting
- ❖ Teachers will be given training on the use of basic podcast instructional methods in teaching General woodwork.
- ❖ Downloading basic podcast instructional methods on the internet.
- ❖ How to deliver basic podcast learning contents using Mp3 player or Projector
- ❖ How to assist students in downloading the contents to their personal devices (Android phone, Laptops and Mp3 players).
- ❖ Practical demonstration of the procedures to ascertain their proficiency in the use of the instructional methods.

TRAINING MANUAL ON VODCAST INSTRUCTIONAL METHODS

Purpose of the manual

The purpose of this manual is to assist General woodwork teachers used in this study on how to deliver the learning contents to the students in the classroom using vodcast instructional methods via projector and laptop and also help the students to download the learning contents on their own personal devices in the topics timber preparation, wood joints, wood adhesives, wood fittings and wood finishes and finishing. The vodcast instructional methods encourage independent learning, improve learner's academic achievement, transferring of knowledge, improve their communication skill and also help in developing student's skills.

Aim of the manual

The aim of this manual is to ensure uniformity of instruction across the groups when they deliver the topics using vodcast instructional methods.

ACTIVITIES FOR THE TRAINING

Detail explanation will be given to the teachers about the research work

- Teachers will be taught what is meant by Podcasting
- Teachers will be given training on the use of vodcast instructional methods in teaching General woodwork.
- Downloading vodcast instructional methods on the internet.
- How to deliver the vodcast learning contents in the class room using projector or laptop
- How to assist students in downloading the contents to their personal devices (Android phone, Laptops and ipods).
- Practical demonstration of the procedures to ascertain their proficiency in the use of the instructional methods.

Appendix O
Data for Hypothesis Analysis

Between-Subjects Factors

		N
Groups	Basic Podcast	72
	Vodcast	54

Tests of Between-Subjects Effects

Dependent Variable: Posttest

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
Groups	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)

Between-Subjects Factors

		N
Groups	Basic Podcast	72
	Vodcast	54

Tests of Between-Subjects Effects

Dependent Variable: Retention

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)

Between-Subjects Factors

		N
Groups	Basic Podcast	72
	Vodcast	54

Tests of Between-Subjects Effects

Dependent Variable: Posttest Interest

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	3125.407[a]	2	1562.704	121.252	.000
Intercept	12722.059	1	12722.059	987.122	.000
Pre-test	3081.277	1	3081.277	239.081	.000
Groups	74.481	1	74.481	5.779	.018
Error	1585.228	123	12.888		
Total	224796.000	126			
Corrected Total	4710.635	125			

a. R Squared = .663 (Adjusted R Squared = .658)

Between-Subjects Factors

		N
Ability	High	36
	Low	20
	Medium	70

Tests of Between-Subjects Effects

Dependent Variable: Posttest

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	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)

Between-Subjects Factors

		N
Ability	High	36
	Low	20
	Medium	70

Tests of Between-Subjects Effects

Dependent Variable: Retention

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	36074.287[a]	3	12024.762	688.353	.000
Intercept	865.446	1	865.446	49.542	.000
Posttest	2316.855	1	2316.855	132.627	.000
Ability	828.492	2	414.246	23.713	.000
Error	2131.205	122	17.469		
Total	484158.000	126			
Corrected Total	38205.492	125			

a. R Squared = .944 (Adjusted R Squared = .943)

Between-Subjects Factors

		N
Ability	High	36
	Low	20
	Medium	70

Tests of Between-Subjects Effects

Dependent Variable: Post Interest test

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	3613.066[a]	3	1204.355	133.870	.000
Intercept	2896.940	1	2896.940	322.008	.000
Pre-test	1.834	1	1.834	.204	.652
Ability	589.491	2	294.745	32.762	.000
Error	1097.569	122	8.996		
Total	224796.000	126			
Corrected Total	4710.635	125			

a. R Squared = .767 (Adjusted R Squared = .761)