

Assessment of the extent of auto-mechanics teachers' utilization of instructional materials for teaching in technical colleges in Edo and Delta States, Nigeria

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Abstract

It is essential that technical teachers should become familiar with the application of various types of instructional materials for effective teaching and learning of auto-mechanics in Nigeria. Therefore, this study focused on the assessment of the extent of auto-mechanics teachers utilizes instructional materials for teaching in technical colleges in Nigeria with specific reference to Edo and Delta States. Three research questions guided the study and three null hypotheses were tested at 0.05 level of significance. The research adopted a descriptive survey design in which the entire population of 79 auto-mechanics teachers was studied. A structured questionnaire was the instrument for data collection and was validated (face and content) by three experts. The test-retest reliability method and Pearson Product Correlation Coefficient were used to yield reliability coefficient of 0.95. Copies of the instrument were administered to 79 participating auto-mechanics teachers and the return rate was 88%. The data collected for the study were analyzed using mean and standard deviation to answer the research questions. The null hypotheses were tested using z-test at 0.05 level of significance. The findings revealed that the auto-mechanics teachers utilized physical and audio visual instructional materials to a moderate extent in their teaching activities, while electronic instructional materials were utilized to a low extent. The findings further indicated that there is no significant difference in the opinions of the auto-mechanics teachers in relation to the extent of utilization of the instructional materials by the teachers based on their gender and locations. Based on the findings of the study, it was recommended that technical teachers should be encouraged to use instructional materials to a very high extent in order to improve teaching and learning so as to enhance students' overall performance/achievement, knowledge and skills. Additionally, academic workshops and seminars should be organized by Government and Ministries of Education to encourage teachers to use various instructional materials in the technical colleges to a high extent.

Keywords: Assessment, Utilization, Instructional Materials, Auto-Mechanics, Technical Colleges

Introduction

Technical education is the foundation of nations' wealth and development. It is a type of education that is meant to produce semi-skilled and skilled technical manpower necessary to restore, re-vitalize, energize, operate and sustain the national economy and substantially reduce unemployment (Eze & Okoye.2008). According to Federal Republic of Nigeria, (FRN, 2013), as contained in Nigerians' National Policy on Education, technical education is an aspect of education that leads to acquisition of practical and applied skills as well as basic scientific knowledge through training. The goals of Technical Vocational Education and Training (TVET) as contained in various editions of the Nigerians' National Policy on Education are as follows:

- Provide trained manpower in the applied sciences, technology and business, particularly in craft, and advanced craft at technical levels; (FRN, 1998, sec.5, para 31).
- Provide the technical knowledge and vocational skills necessary for agricultural, commercial and economic development; (FRN, 2004, sec.7, para.42).
- Give training and impart the necessary skills to individuals who shall be economically self-reliant. (FRN, 2013, sec.3, para.50).

Technical colleges are therefore the institutions where students are trained to acquire relevant knowledge and skills in different occupations for employment in the world of work. According to the Federal Republic of Nigeria, (FRN, 2013), technical college is a segment of Technical and Vocational Education (TVE) designed to produce craftsmen at the secondary school level and master craftsmen at the advanced craft. They are therefore regarded as the principal vocational education institutions in Nigeria (Umunadi, 2010). Hence, the fundamental concentration of teaching and learning at this level of education involves practical training using innovative methodologies of applying science, materials, tools, devices, equipment, machinery, and other resources to enable competent workers solve practical-based problems (Eze, 2009). This may involve manipulation of materials in form of performance task as simple as using a spanner to tighten or loose a bolt or as complex as using a set of tools in a process of dismantling and assembling of engine parts as applicable in auto-mechanics trades.

Auto-mechanics trade in technical colleges involves the application of scientific knowledge in the design, selection of materials, construction, operation and maintenance of automobiles. It is a mechanical trade offered as motor vehicle mechanics work trade in Nigeria technical colleges

(FRN, 2013). According to National Board for Technical Education, NBTE, (2003), auto-mechanics craftsmen are expected to test, diagnose, service and completely repair any fault relating to the conventional automobile assembly main units and systems to the manufacturers' specifications. The requirements of these tasks demand a high quality of instructional strategy in technical colleges to improve auto-mechanics instruction. Owing to technological development and industrial revolution in the automobile industry which bring complexity in cars designs, a variety of instructional materials are needed to support and improve teaching and learning activities in auto-mechanics trades (Agbata, 2000). Indeed, the more sophisticated the automobile, the more difficult it is to repair or service them, particularly those imported to developing countries like Nigeria. This situation has placed serious on challenges on the education system, which has the role, function and responsibility of equipping learners with the knowledge; attitudes and skills necessary to match the pace of the technological changes in the automobile industry all over the world (Schwaller, 2009). Therefore, to meet the challenges in automobile industry entails that teachers must employ appropriate instructional materials/aids.

Instructional materials are sometimes designed or adopted by teachers and used to facilitate students learning. Instructional materials therefore refer to those alternative channels of communication, which classroom teachers can use to concretize concepts during teaching and learning processes. Instructional materials hence connote those materials and facilities that can be used to ease, encourage, improved and promote teaching and learning activities. Because traditionally, classroom teachers have relied heavily on the talk-chalk method during their teaching, the application of teaching materials can support students' learning and increase their success. Instructional materials therefore constitute the media of exchange through which a message transaction is facilitated between a source and a receiver.

Furthermore, instructional materials help students to acquire facts, skills, competencies, and opinions and also to develop cognitive processes. The teachers may use different instructional materials to motivate learning by using textbooks, charts, models, graphics, real objects as well as improvised materials (Awotua-Efebo, 2001). The success of achieving the desire objectives in an instructional situation depends on the suitability, adequacy and effective utilization of the instructional materials (Olaitan & Agusiobo, 1994). Indeed instructional materials provide the much needed sensory experiences required by the learners for an effective and meaningful behavioural change. Ideally, instructional materials could help to provide variations in the ways in which messages are sent across to the learners. Some of the instructional materials

often used in teaching and learning includes the followings: graphic materials, instructional charts, still pictures, three-dimensional materials, still projected materials, motion pictures, and audio materials, electronic, audio-visual and visual or physical/instructional materials.

Physical instructional materials are teaching materials that appeal to the sense of sight. They are materials giving out only what learner can see. Ughamadu, (2012) in Anyanwu (2003) asserted that physical or visual materials are those materials that do not require any form of projection before they can be used. In auto-mechanics the commonly used physical instructional materials in the workshop are spanners, pliers, hacksaws, and axle stands, wheel alignment, wheel balancing, feeler gauge, chisels, files, soldering iron, hammers and hydrometer. These physical or visual aids have a lot of advantages. Some of these advantages are: They are usually seen, easily attract attention, arrest the interest of learners, give room for comparison by enabling learners to find out similarities, relationship and contrast between various things, and further provide opportunities for closer and critical studies by learners. Above all, they make abstract symbols to appear concrete.

Another set is the electronic instructional materials such as computer devices or electro-mechanical machines which are used as an instructional system in education. The electronic instructional materials have now been found to be the most suitable and versatile medium for individualized learning because of its immense capacity as data processors, and can be used for teaching different students. They can also perform mathematical and logical operations when given the desire inputs by individuals. The electronic instructional materials are used in many ways in vocational subjects' instructions such as auto-mechanics mass instruction, group learning, individualized instruction, and computer conferencing system among others (Abdulkadire, 2011).

In vehicles, different computer programmes are installed in order to diagnose faults using (On –Board Diagnostic). This scan tool can also access diagnostic troubles codes (DTC), run test to check system operations and monitor activity of the engine. Microprocessors (Engine Control Unit or Brain box) are electronic micro-components or sensors that sense engine demands and communicate to the appropriate engine components in the vehicle.. Therefore auto-mechanics cannot be effectively thought without the use of modern electronic instructional materials. Electronic instructional materials could enhance teaching and learning through its dynamic, interactive, and engaging content; it could provide real opportunities for individualized instruction. According to Yusuf, (2005) electronic resources have the potential to accelerate, enrich, and deepen skills; motivate and engage students in learning; help to relate school experiences to work practices; help to create economic viability for tomorrow's

workers. Furthermore. Yusuf went on to assert that it could contribute to radical changes in school; strengthen teaching, and provide opportunities for connection between the school and the world.

The third types of instructional materials are audio materials. Audio materials are those instructional materials producing only sound effect. This means that, learners can only use them by listening to the voice from the speakers using their auditory systems. Audio aids include radio set, gramophones, turn-tables, tapes, video discs, and cassette recorders. All these items serve various functions in teaching and learning. As Akolo, (2010) commented, audio instructional materials used for teaching-learning help to bring about permanent and meaningful experience. Thus audio instructional materials contribute significantly to the teaching-learning process. Therefore, teaching with audio materials resources can be employed to enhance effective and efficient communication in the teaching-learning process (Okobia 2011). They can be used to support and stimulate classroom teaching, cognitive development and socio-moral development. It also leads to more understanding and retentive memory in students as well as enhancing better performance of students (Ughamadu, 2012). In this age of technological advancement, learning and teaching resources should not confined to recommended textbooks alone, and they are available in several different forms like reference books, workbooks, worksheets, web-based learning materials, computer based learning, structured coursework and audio teaching aids. Libraries and learning communities also serve as effective tools in the natural environment of learning (Savery, 2015).

The purpose of utilizing teaching and learning resources in the classroom is to assist/support the teacher with the presentation and transmission of educational content for the achievement of educational objectives, whilst aiding the students to acquire knowledge, skills abilities and values. Accordingly, Esu, Eukoha and Umoren (2004) affirmed that instructional materials facilitate learning of abstract concepts by helping to concretize ideas and stimulate learners' imagination. Also, According to Mathew (2012) instructional materials help to increase active participation of students in the learning process while saving teacher energy, reducing the teacher centeredness in teaching. Similarly, Omabe (2006) asserted that instructional materials are central in the teaching and learning especially in auto-mechanics because they are used to compliment efficiency of teachers, and effectiveness in lesson deliveringly. Likewise, Olumorin, Yusuf, Ajidagba and Jekayinfa (2010) also observed that instructional materials help teachers to teach conveniently and the learners to learn easily without stress. In the same vein, Olumorun et al asserted that instructional materials have direct contact with the sense organs of the students. In addition, Kochhar (2012)

supported this view that, instructional materials are very significant learning and teaching tools. Furthermore, Kochhar added that there is need for teachers to find necessary and relevant instructional materials to complement classroom interaction and recommended textbooks in order to broaden and arouse students' interests in the subject matter. Still, Ibeneme (2000) observed that teaching aids are important for practical and demonstration in the class for students and teachers.

It is essential to thoroughly consider the importance of educational resources as recently proffered by various authors. Ikerionwu (2000) saw instructional materials as devices that assist the teacher to present a lesson to the learners in a logical manner. Ikot (2008) saw instructional materials as visual and audio-visual aids, concrete or non-concrete, used by teachers to improve the quality of teaching and learning activities. Agina-Obu (2005) submitted that instructional materials of all kinds appeal to the sense organs during teaching and learning. Isola (2010) also described instructional materials as objects or devices that assist the teachers to present their lessons logically and sequentially to the learners. Besides, Isola added that instructional materials are meant to improve the quality of education for effective academic performance of students in schools. Consequently, Oluwagbohunmi and Abdu-Raheem (2014) acknowledged that instructional materials are used by teachers to aid explanations and make learning of the subject matter understandable to students during teaching learning processes. Oso (2011) also agreed that one of the best way for teachers to make use of their manipulative skills is to improvise instructional materials so as to achieve their lesson objectives at least to a reasonable extent. All these views suggest that the use of instructional materials can improve students' overall performance/achievement in important examination. Thus, Eze and Okoye, (2008); Esu, Enuokoha and Umoren (2004) and Ibeneme, (2000) enumerated the importance of instructional materials in teaching and learning processes which include that instructional material:

- Offer tremendous possibilities in enhancing students' learning, developing teachers' professional capability and strengthening institutional capacity.
- Improve a continuity of thought; this is especially true of motion pictures, as they provide experiences not easily obtained through other materials.
- They could contribute to the efficiency and variety of learning.
- Have a high degree of interest for the learner, for they offer a reality of experience, which stimulates self-activity on the part of pupils.
- Make learning more interesting, practical, realistic and appealing.

- They also enable both the teachers and students to participate actively and effectively in lesson sessions.
- Give room for acquisition of skills and knowledge and development of self- confidence and self-actualization.
- Exposes the learner to primary experiences and enriches learning.

In spite of the outlined benefits of instructional materials, there are also some shortcomings such as follows: Quality materials take time to produce and adequate staff time as well as resources need to be allocated: Teacher-made materials will not normally have the same standard of design and production as commercial materials and hence may not present the same image effect as commercial materials. Therefore for teaching and learning processes to be effective in auto-mechanics subject it is pertinent to employ appropriate teaching resources.

Instructional materials theories according to Gagen, Wager, Golas & Keller, (2005), assume that there is a direct link between the materials that the teachers use, and the students' learning outcome. These outcomes include higher abilities to learn, quality strategies to learn and perform classroom activities and positive attitude towards learning. Furthermore, these theories assume that instructional materials have the capacity to develop students to the highest order of intellectual skills as they illustrate clearly, step by step how to follow the rules/principles and elaborate on the concepts. These have positive impact in solving students' new problems by analyzing the situation and formulating a plan (Gagné, et al. 2005). Instructional materials can be used to develop higher learning abilities in the learners through self-teaching or guided learning. This implies that the instructional materials mainly center on eliciting performance and providing feedback on performance correctness, in addition to providing learning guidance for guided discovery learning. However, the use of instructional materials does not only encourage teachers and students to work collaboratively but also results in more cooperative learning activities among the students. The outcome is providing all students comprehensive education, one that incorporates academic skills and technological knowledge that prepare them for the future. Furthermore, auto-mechanics as an abstract course may not be effectively taught without adequate utilization of instructional materials which could involve; seeing, listening, touching and manipulating of tools and equipment which are the gateways of human learning in this 21st century (Momoh, 2006). Oluwagbohunmi and Abdu-Raheem (2014) stated that in making use of any instructional materials, such materials must be previewed by the teachers who should:

- Have full knowledge of the teaching materials;
- Prepare the environment where it will be used;
- Prepare listeners by means of making sure that the teaching materials to be used will attract attention, arouse, motivate and sustain interest.
- Provide the rationale that could be used in the beginning, middle and at the end of the lesson.
- Be guided by expert ideas during his production and utilization of instructional materials.

The effectiveness of utilizing appropriate instructional materials in teaching and learning processes in auto-mechanics may not void of quality instructor (Ntasiobi, Francisca & Iheanyi, 2014). Therefore, effective pedagogical delivery depends majorly on cordial relationship and free flow of communication between the teachers and the students. Accordingly, Olumorin, Yusuf, Ajidagba & Jekayinfa, (2010) asserted that the criteria for assessing instructional material are very important to make teaching effective and meaningful:

- Content-Curriculum and standards are current, valid and reliable, with real world examples, design must meet interest of the individual learners from various skills levels, enhancing conceptual understanding and engages higher order thinking skill as well as free from bias.
- Equity and accessibility- Materials should be available and accessible to the teacher for effective utilization.
- Appropriateness- Materials are appropriate for the subject matter and also appropriate for the learners' capacity or level of learning;
- Presentation-Comprehensiveness to the student' and teacher resources, alignment of instructional components, organization of instructional materials, readability of instructional materials, pacing of content of use and durability of the materials.
- Learning- Motivational strategies, explicit instruction, guidance and support, active participation of students, targeted instructional strategies and targeted assessment strategies.
- Cost- The materials used for teaching should not be expensive, as long as it is eye captivating and catches the attention of the students, then it is an effective instructional materials.

The instructional materials that auto-mechanics teachers require are many and could vary from one technical college to another. This is true, because some instructional materials may be available in one technical college and may not be easily readily available in other technical colleges. Also some technical colleges are located in rural

areas, while some are located in urban areas. It is most likely, that the instructional materials utilized by auto-mechanics teachers' in the rural areas for teaching in technical colleges in Edo and Delta States could differ from those which the teachers in urban areas require. Likewise, among the technical teachers, there are males and females. It is most probably, that the gender disparity among them could introduce different views in the use of instructional materials for teaching in technical colleges. Furthermore, since the academic qualifications of the technical teachers often vary from National Certificate Education (Technical) to Doctor of Philosophy in Education, it is most likely that these varying qualifications may have effect on how the teachers use the instructional materials in teaching auto-mechanics trade. Additionally, the years of teaching experience of the technical teachers could range from zero -35years. Thus, these varying experiences may have some effect on the extent of teachers' utilization of appropriate instructional materials for teaching auto-mechanics. By and large, there may not be effective teaching and learning particularly in auto-mechanics without the effective use of the appropriate instructional materials and facilities.

It is the researchers' opinion that auto-mechanics teachers in Edo and Delta States should recognize the significance of instructional materials and should make adequate use of them in classroom situations with the specific purpose to improve students' academic performance in public examinations. Since there are still persistent poor performances of students in auto-mechanics in public examinations, there is need for assessment of the extent of auto-mechanics teachers' utilization of instructional materials in teaching in technical colleges in Edo and Delta States.

Statement of the Problem

The teaching and learning of auto-mechanics in technical colleges appears to be dominated by oral presentation without application of instructional materials in the classroom situations. This makes students' learning difficult, and this leads to several failures in public examinations and high dropout level in the auto-mechanics subject. Auto-mechanics as a technical course is abstract and complex in nature, and may not be effectively taught without adequate utilization of instructional materials (Momoh, 2006). Thus when right instructional materials are utilized, it may likely facilitate learning, impress students more sufficiently than thousands of explanations by teachers. This is so, because the end result of teaching and learning is that students' perform well in specific and broad situations. Accordingly, Afolabi and Adeleke (2010) identified non-availability, inadequacy and non-utilization of instructional materials in teaching and learning as a major factor responsible for predominant use of lecture method.

Furthermore, experience has shown that when appropriate and adequate instructional materials are utilized, students' interest is aroused, the lesson becomes real, and students would participate more actively, and could as well as retain more knowledge than when instructional materials are not utilized for lesson delivery (Adedijo, 2000). Since persistent high failure rate in public examinations among graduates of technical colleges in auto-mechanics trade could be attributed to poor teaching methods, arising from failure of teachers to utilize appropriate instructional materials, there is great need to assess the extent of auto-mechanics teachers' utilization of instructional materials in teaching in technical colleges.

Purpose of the Study

The purpose of the study was therefore to determine the extent of auto-mechanics technical teachers' utilization of instructional materials for teaching in technical colleges. The technical colleges in Delta and Edo states were chosen for this study. Specifically, the study sought to determine the extent to which auto-mechanics teachers:

1. Utilize physical instructional materials in teaching in technical colleges.
2. Utilize audio instructional materials in teaching in technical colleges.
3. Utilize electronic instructional materials in teaching technical colleges

Research Questions

The following three research questions guided the study:

1. To what extent do auto-mechanics teachers in technical colleges utilize physical instructional materials in teaching?
2. To what extent do auto-mechanics teachers in technical colleges utilize audio-instructional materials in teaching?
3. To what extent do auto-mechanics teachers in technical colleges utilize electronic instructional materials in teaching?

Hypotheses

The following three null hypotheses were tested at 0.05 levels of significance.

1. Male and female auto-mechanics teachers in technical colleges do not differ significantly in their mean response on the extent to which they employ physical instructional materials for teaching auto-mechanics.

2. Auto-mechanics teachers in technical colleges do not differ significantly in their mean response on the extent to which they employ audio-visual instructional materials for teaching of auto-mechanics based on their locations (Urban and Rural).
3. Auto-mechanics teachers in technical colleges do not differ significantly in their mean response on the extent to which they employ electronic instructional materials for teaching of auto-mechanics based on their academic qualification.

Method

A descriptive survey research design was adopted in this study. According to Nworgu (2015) a research design is a plan or blue print which specifies how data relating to a given problem should be collected and analyzed. The study was conducted in technical colleges in Edo and Delta States of Nigeria. The population of the study consists of the 79 Auto-mechanics teachers in the thirteen government-owned Technical Colleges in Edo and Delta States. The entire auto-mechanics teachers in the Government owned Technical Colleges were involved in the study. Thus, there was no sampling involved in the study since the population was small and manageable. The instrument for this survey is a 75 item structured questionnaire titled Assessment of the Extent of Auto-mechanics Teachers' Utilization of Instructional Materials for Teaching in Technical Colleges in Edo and Delta States (AEATUIMTTC). The instrument is in two sections. Section A consists of items that sought information on the personal data of respondents. The rest (Section B) of the instrument was structured on 5 point rating scale thus: Very High extent (VGE) =5, High extent (HE) 4, Moderate extent (ME) =3, Low extent (LE) =2 and Very low extent (VLE) 1.

The instrument was face and content validated by three experts. The experts were drawn thus; one from Measurement and Evaluation Department, and two from Technology and Vocational Education Department - all of Nnamdi Azikiwe University, Awka. The research purpose, research questions, null hypotheses and draft copies of the questionnaire were submitted to the experts. The experts examined original seventy five instruments in terms of relevance and clarity. They were also to ascertain if the items were related to the objectives of the study. The research instrument items were then reduced to 67 after validation.

For purposes of reliability, the instrument was administered on two occasion on twenty teachers drawn from Government Technical College, Awka, Anambra State which is outside the area of the study. The results for these two occasion was collected. Test-retest-reliability coefficient of the instrument was calculated with the two

results using Pearson Product Moment Correlation Coefficient. This yielded reliability coefficient of 0.95.

The data for the study were collected by the use of questionnaire designed by the researchers. The researchers administered questionnaire to participants (teachers) in order to reduce the chances of poor completion, as well as to increase the rate of return. Thereafter, the completed copies of the questionnaire were collected for data analysis. Out of seventy nine (79) copies of the questionnaires distributed, thus seventy (70) copies were completed and returned. Thus, the seventy (70) collected copies representing 88% of population were used for the study. The research questions were answered using arithmetic mean and standard deviation. The real limits of

numbers of the scale values were used for the mean ratings. The null hypothesis was tested using z-test at 0.05 level of significance. If the z-calculated is equal to or greater than the z-critical, at 0.05 level of significance, the null hypothesis would be rejected, but if the z-calculated is less than the z-critical, at 0.05 level of significance, the null hypothesis would be accepted.

Results

Research Question 1: To what extent do auto-mechanics teachers in technical colleges utilize physical instructional materials for teaching?

Table 1: The mean responses on the extent of auto-mechanics teachers' utilization of physical instructional materials in teaching in technical colleges

S/N	Items	Mean	Std. Dev.	Remarks
1	Combination pliers	4.36	0.88	High extent
2	Adjustable spanners	4.32	0.87	High extent
3	Flat spanners	4.11	1.06	High extent
4	Ring spanners	4.15	0.83	High extent
5	Combination spanners	4.10	1.06	High extent
6	Hydraulic press	2.81	1.15	Moderate extent
7	Socket box	3.94	0.90	High extent
8	Workshop vice	2.78	1.14	Moderate extent
9	Phasing calibration machine	2.25	0.93	Low extent
10	Clutch alignment gauge	2.07	0.48	Low extent
11	Valve spring compressor	1.75	0.52	Low extent
12	Dial indicator	1.92	0.47	Low extent
13	Dynamometer	1.81	0.40	Low extent
14	Injector machine service kit	1.82	0.54	Low extent
15	Airline gauge/ inductive timing light	1.61	0.55	Low extent
16	Wheel alignment	1.83	0.53	Low extent
17	Dwell tester	1.89	0.55	Low extent
18	Axle stand	4.54	0.82	High extent
19	Wheel balancing machine	1.86	0.45	Low extent
20	Vulcanizing cooker/machine	2.01	0.64	Low extent
21	Allen key	4.35	1.19	High extent
22	Circlip pliers	2.96	1.03	Moderate extent
23	Compression tester	2.07	0.74	Low extent
24	Wheel spanners	1.39	0.55	Low extent
25	Feeler gauges	4.14	0.83	High extent
26	Lead weight/Soldering Lead	4.39	0.86	High extent
27	Flexible rod with magnetic tip	1.29	0.49	Very low extent
28	Hacksaws	4.25	0.73	High extent
29	Piston ring compressor	1.69	0.49	Low extent
30	Live petrol and Diesel engine	4.40	0.85	High extent
31	Textbooks/ Journals	4.21	0.77	High extent
32	Safety equipment /wears	4.36	0.76	High extent
33	Flipcharts with pictures	1.46	0.50	Very low extent
34	Screw drivers	4.38	0.88	High extent
35	Hammers/Mallets	4.46	0.82	High extent
36	Sulphuric acid	1.88	0.73	Low extent
37	Files/Chisels	4.24	0.80	High extent
38	Newspapers//Magazines	1.49	0.53	Very low extent
39	High rate discharge tester	1.64	0.48	Low extent
40	Batteries /Battery charger	4.50	0.77	High extent
41	Hydrometer	1.89	0.76	Low extent
	Cluster Mean	2.96	0.36	Moderate extent

Table 1 show that the auto-mechanics teachers in technical colleges utilized physical instructional materials for teaching at moderate extent. The inclusion of physical instructional materials is to assess the extent of utilization in teaching and learning processes which support teachers'

delivery of their lessons during classroom instruction. The cluster mean is 2.96 which indicate moderate extent.

Research Question 2: To what extent do auto-mechanics teachers in technical colleges utilize audio instructional materials for teaching?

Table 2: The mean responses of auto-mechanics teachers' utilization of audio instructional materials for teaching

S/N	Items	Mean	Std. Dev.	Remarks
42	Audio tapes	1.46	0.50	Very low extent
43	Radio set	1.54	0.56	Low extent
44	Audio Cassette	2.01	0.36	Low extent
45	Disc player	1.54	0.53	Low extent
46	Tape Recorders	1.79	0.53	Low extent
47	Cartridge	1.75	0.44	Low extent
48	Tele conferencing	1.83	0.53	Low extent
49	Language Laboratories	1.61	0.55	Low extent
50	Telephone/ Fax machine	1.54	0.58	Low extent
51	Laptops	1.42	0.55	Very low extent
	Cluster Mean	1.65	0.29	Low extent

The results shows that the respondents' opinion on that items 43,44,45,46,47,48,49 and 50 indicates that the teachers utilized radio set, audio cassette, disc player, tape recorders, cartridge, teleconferencing, language laboratories, telephone/ fax machine to a low extent while laptop is at very low extent during their teaching activities. The inclusion of audio instructional materials is to determine the extent of utilization and exposure of the instructional materials in teaching and learning processes.

Consequently, the findings further revealed that the teachers utilized the items 42 and 51 which are audio tapes and tablature to a very low extent. The cluster mean indicates that the teachers generally utilizes the audio instructional materials at a low extent (1.65)

Researcher Question 3: To what extent do auto-mechanics teachers in technical colleges utilize electronic instructional materials for teaching?

Table 3: The mean responses on the extent of auto-mechanics teachers' utilization of electronic instructional materials in teaching technical colleges

S/N	ITEMS	MEAN	STD. DEV	REMARKS
52	Computers	2.21	0.69	Low Extent
53	Printers	1.90	0.34	Low Extent
54	External storage devices	1.44	0.50	Very Low Extent
55	Television set	1.26	0.44	Very Low Extent
56	CD-ROM/DVD Players	1.60	0.69	Low Extent
57	Internet/Network	2.06	0.47	Low Extent
58	Modem/ Flash drives	1.75	0.52	Low Extent
59	On-board diagnosis (ODB11)	1.67	0.61	Low Extent
60	Projector machine	1.50	0.50	Low Extent
61	Electronic whiteboard	1.40	0.52	Very Low Extent
62	Computerized wheel balancer	1.29	0.46	Very Low Extent
63	Ammeter/voltmeter	1.49	0.58	Very Low Extent
64	Injector cleaner	1.40	0.55	Very Low Extent
65	Mobile tutor	1.61	0.52	Low Extent
66	Satellite dish	1.39	0.49	Very Low Extent
	Cluster Means/SD,	1.61	0.18	Low Extent

Table 3 shows that the respondents utilized electronic instructional materials at low extent. The inclusion of electronic instructional materials such as computers, mobile tutor and internet/e-learning materials is to assess the extent of utilization of modern technological tools in teaching and learning processes for effective delivery of

their lesson in classroom instruction. The cluster of means is 1.61 which indicates that the teachers generally utilized the electronic instructional materials at low extent.

Hypothesis 1

Table 4: Result of z-test of male and female auto-mechanics teachers' on utilization of physical instructional materials in (mean score) teaching in technical colleges

Sources of Variation	Gender	N	Mean	SD	α -level	z-cal	z-tab	Df	Sig.	Decision
Utilization of physical instructional materials mean score	Male	60	2.96	0.37	0.05	0.12	1.96	69	0.90	Do not reject
	Female	19	2.95	0.31						

The z-test analysis summarized in Table 4 reveals that there is significance difference between the mean ratings of responses of male and female auto- mechanics teachers as regards the utilization of physical instructional materials for teaching exercises. Tested at 0.05 level of significance and degree of freedom (69), the z - calculated (0.12) is less than the z-critical (1.96), at (0.05) significance. This led to the decision that the null hypothesis should do not reject. That is there is statically difference between the means responses of male and female auto-mechanics teachers

with regard to extent of utilization of physical instructional materials.

Hypothesis 2

Auto-mechanics teachers in technical colleges will not differ significantly on extent to which they utilize audio instructional materials for teaching of auto-mechanics based on the locations of the college ($P \leq 0.05$).

Table 5: Result of z – test on the rating of auto-mechanics teachers' on utilization of audio instructional materials in teaching on their locations (urban and rural)

Sources of Variation	Rural and Urban	N	Mean	SD	α - level	z-cal	z-crit	Df	Sig.	Decision
Utilization of audio instructional materials mean score	Urban	48	1.54	0.25	0.05	0.81	1.96	69	0.42	Do not reject
	Rural	31	1.50	0.22						

The analysis summarized in Table 5 shows that there is no significant difference between the mean ratings of the responses of the respondents of (auto-mechanics teachers) in the utilization of audio-visual instructional materials based on their locations. Tested at 0.05 significance, while degree of freedom (69), and the z-calculated (0.81), obtained is less than z-critical (1.96).

Therefore at that level of significance ($P \leq 0.05$) the z-calculated is less than z-critical; therefore, the null hypothesis do not reject. Thus there is no statistical difference between the rating of auto-mechanics teachers in the urban and rural areas with regard to the use of audio visual instructional materials.

Table 6: The z-test result of the rating of auto-mechanics teaching in the application of electronic instructional materials for teaching based on academic qualifications

Sources Variable	of Academic Qualification	N	Mean	SD	α -level	t-cal	t-crit	Df	Sig.	Dec.
Utilization of electronic instructional materials mean Score	First degree and below	69	1.62	0.19	0.05	0.80	1.96	69	0.3	Do not reject
	Master and above	10	1.58	0.14						

The Table 6 above is the summary of the analysis of z- test that tested the null hypothesis. The analysis shows that there was no significant difference in the mean ratings of the responses of the auto-mechanics teachers in the application of electronic instructional materials for teaching of auto-mechanics based on academic qualifications. Consequently the t-calculated = (0.80), is less than t-critical = (1.96), tested at 0.05 level of significance and degree of freedom= (69) and significance = (0.43), therefore we do not reject the null hypothesis. Thus, it was concluded that there was no significant difference in the extent of utilization of electronic instructional materials by first degree holders and masters' holder's auto-mechanics teachers in technical colleges.

Discussion

The findings of the study revealed that the auto-mechanics teachers in technical colleges in Edo and Delta States utilize physical instructional materials for teaching at moderate extent (mean =2.96). This is in consonance with the findings of Okoh (2004) and Umunadi (2004) that vocational subject teachers did utilized physical instructional materials moderately on daily basis during classroom instruction thereby affecting positively students' academic performance in public examination.

The findings of the study revealed that the auto-mechanics teachers in technical colleges utilized audio instructional materials at low extent, with the cluster mean of 1.53. This shows that their level of utilization of audio instructional materials lives much to be desired. This finding supports the finding of Awobodo (2000) who has noted that technical teachers' utilization of relevant instructional materials/ facilities in teaching need to be enhanced, so as to improve academic achievement and inspire interest in learners.

The findings of the study further revealed that the respondents utilized electronic instructional materials at a low extent with the cluster mean of 1.61. This means that their level of utilization of electronic instructional materials such as computers, mobile tutor, and internet materials

needs a lots of encouragement. This is necessary because modern automobiles are computerized and digitalized and therefore teaching and learning of auto-mechanics may not be very successful without having adequate knowledge of computer operations in this information and communication technology era. This findings agrees with Adeola, (2010) who supported the inadequate utilization of electronic instructional materials could led to producing graduates without requisite skills and work habits in this technological era

The study further revealed that there was significant difference between the mean responses of male and female auto-mechanics teachers as regards the utilization of physical instructional materials in teaching exercise. In other word, male and female auto-mechanics teachers differ significantly in the way they visualized and utilized the physical instructional materials as necessary tools in the teaching and learning process. The findings was supported by Adagio (2000) who found that the male and female teachers in secondary schools do differ in their opinions on the utilization of instructional materials in schools in teaching mathematics.

Furthermore, the findings revealed that there was no significant difference between the mean ratings of the respondents due to locations (urban and rural) of auto-mechanics teachers as regards the utilization of audio instructional materials in teaching exercise. This means that irrespective of the locations (urban/rural) of the teachers their levels of utilization of the audio instructional material do not significantly differ. The findings also is in agreement with Ibrahim and Abdullahi, (2010) which reported that the locations of teachers did not, whether rural or urban, affect the level of utilization of audio instructional materials in technical colleges.

The finding also revealed that there was no significant difference in the mean ratings of the respondents based on the academic qualifications of the auto-mechanics teachers in the application of electronic instructional materials for teaching of auto-mechanics. It therefore follows that, despite the academic qualifications of the auto-mechanics teachers, they do not in any way rate the utilization of

electronic instructional materials differently. The finding is also in agreement with Ibrahim and Okobia (2011) who found that academic qualification of teachers do not necessarily determine their rating level of utilization of instructional materials, but rather much depend on individual creativity and resourcefulness of the teachers.

Conclusions

Based on the findings of the study, it was concluded that auto-mechanics teachers utilized physical instructional materials to a low extent, electronic instructional materials to a moderate extent while audio to a low extent. Therefore, it is important that auto-mechanics teachers should endeavour to apply to a very high extent all classes of instructional materials in their classroom teaching and learning processes, to enhance knowledge, abilities and skills as well as overall academic achievement/performance of students in the subject matter.

Recommendations

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

1. Auto-mechanics teachers should be encouraged to and try their best to make use of available physical instructional materials to high extent to make their lessons more interesting
2. Auto-mechanics teachers are encouraged to search for necessary electronic instructional materials that can appeal to the senses of learners, arouse their interest, encourage their participation, make learning more meaningful and promote academic standard. This is most essential since most modern automobile are computerized.
3. School principals should provide teachers with enabling environment for the use of available instructional material to give room for participatory studentship and make learning more meaningful.
4. Governments should supply teaching aids and finance schools to improvise unavailable and inadequate instructional materials to make teaching and learning easier, practical, appealing and enjoyable.
5. Resource centers should be established and developed in all the technical colleges and should be equipped with modern instructional materials from where teachers could loan materials.
6. There should be policy formulation that will ensure adequate provisions of foreign and local instructional materials in technical colleges.

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