Effect of Class-Wide Peer Assisted Learning Strategy on Students' Academic Performance Using Automotive Diagnostic Tools by NCE III Students

A.S. Adamu[1], J.D. L'kama[2] and S.Z. Kumazhege[3]

[1]Faculty of Technology Education, Abubakar Tafawa Balewa University, Bauchi, Bauchi State.

[2,3]School of Science and Technology Education, Modibbo Adama University of Technology, Yola, Adamawa State.

Email: bsadiqs22@gmail.com

***Abstract*—** This study determines the effect of class-wide peer-assisted learning strategy (CWPALS) on students' academic performance on the use of automotive diagnostic tools in colleges of education in North-east, Nigeria. The rational of the study was that CWPALS supports collaborative learning that encourages partnership among peers with students as teachers and teachers as facilitators of learning. The study employed true experimental Pretest posttest equivalent research design. A sample size of twenty-four (24) NCE III students participated in this study. 12 students each were assigned as experimental and control group. The experimental group was designed to promote class-wide peer assisted learning, where deliberate opportunities are provided for students to act as teachers and teachers as facilitators. An automotive diagnostic tools assessment instrument adapted from NPOWER/NADDC was used for data collection. The assessment comprises of 30-items that measure the extent of students' performance in using automotive diagnostic tools The instrument has a reliability of 0.81 calculated using Cronbach alpha. T-test was used for the analysis of the data using SPSS software. The findings of the study reveals that here was a significant difference in the student's academic performance in favour of the experimental group. Based on this finding, the study recommends that training should be conducted for lecturers of automobile technology in FCE (T) in north-east, Nigeria should imbibe the use of CWPALS in teaching the use of automotive diagnostic tools.

***Keywords*—** Class-Wide Peer Assisted Learning Strategy, Automotive Diagnostic Tools, Federal Colleges of Education, Demonstration Method of Teaching, Automobile Technology and Academic Performance.

INTRODUCTION

The system of education in Nigeria that provides training for skill acquisition, economic development, and emancipation of citizens from poverty is Technical and Vocational Education (TVE). Kehinde and Adewuyi (2015) believes that Vocational and Technical Education has been integral part of national development strategies in many societies because of the impact on human resource development, productivity and economic development. It holds the key to national development of most nations. In the same vein, Vijay (2017) states that, Technical Education is instrumental in making the remarkable contribution to economic growth of the developing countries by way of suitable manpower production according to the needs of the Industry, Society and the Global World as a whole.

The improvements made in the area of Technical and Vocational Education seemed to be in consonance with the economic development of Nigeria. Nwosu and Micah (2017) asserted that the policy statement on Education of 1925 helped in uplifting not only the image of Vocational and Technical Education in Nigeria but also fast tracking the economic growth and development of the country. Technical Institutions in Nigeria are the ones that metamorphosed into Technical Colleges at lower level and Colleges of Education at higher level (Bisalla & Adeyemi, 2016).

These Colleges of Education (Technical) offer technical and vocational courses among which is Automobile Technology. Automobile itself as it is known today, evolved through a series of technological advancements. This assertion was supported by Helderman (2012) who pointed out that for centuries, man either walked or used animals to provide power for transportation. After the invention of electric, steam, and gasoline propulsion systems, people used self-propelled vehicles, which are vehicles that moved under their own power.

Gill (2016) categorized automobile systems and their sub-systems as: Body and chassis system, engine system, electrical system and power train system, with the advent of modern technology, computer system now formed part of today's automobile. Thus, the incorporation of sensors, actuators, electronic control units/modules (ECUs/ECMs) and so on which form the basis for engine management system and consequently gives room for computer engine diagnosis.

Engine diagnosis are the techniques involved with identifying and assessing problems that may negatively affect the normal operation of a vehicle. In this era of advanced technological change in modern automobiles, identifying and assessing problems in vehicles have become more sophisticated and needs more advanced diagnostic tools in order to be able to identify a problem. This prompted the use of Computer diagnostic tools which is required for most modern cars; According to Helderman (2012), Computer diagnostics are software programs designed to scan the hard disk and other computer hardware components of a computer system, and identify any issues that may be hampering the overall performance of that system. Many diagnostic utilities of this type also have the capability of correcting those issues, and thus restoring full function to the system immediately after the diagnostics session is completed.

Diagnostic tools have to be used accurately with great expertise and precision for a problem to be thoroughly checked, traced and diagnosed before proper repair can take place. Using these diagnostic tools by the Automobile Technology Education students of Federal Colleges of Education is now imperative as most modern vehicles are fitted with ECUs/ECMs which store fault codes that can only be accessed using such tools. But unfortunately, a lot of students of Automobile Technology in Colleges of Education are graduating without the necessary skills needed to use the diagnostic tools effectively and efficiently despite being in the curriculum as part of engine management system which falls under engine service and repair (Shehu, Birma, Rufai, Eric, Jibrin, & Zubairu, 2016). Freund (2013) emphasized that one of the keys to the quality of the TVET is the method of instruction employed by instructors and learning styles imbibed by students. Going by this statement it is evident that instructional approach is a key component in imparting the necessary knowledge and skills needed for effective use of automotive diagnostic tools.

A report by UNESCO-UNEVOC (2019) concluded that TVET form of education has not lived up to its expectation in terms of achieving its goals in Nigeria and suggested that this development could be as a result of not implementing a workable mode of delivery for TVET programmes.

This may be connected with the instructional approach employed by the lecturers in imparting such knowledge to students as was opined by Okoye and Arimonu (2016) when they identified six problems associated with the current technical and vocational curricula in Nigeria.

Unfortunately, conventional teaching method is more widespread in Nigeria than modern methods of teaching and there is a need to investigate empirically how to introduce new methods of teaching that will help students to improve on their performance in automobile technology education (Udogu, 2015). Recent studies such as Starr (2009), Costantini (2015), Hussaini (2018) and Walkup-Amos (2020) have also shown that, conventional method of teaching focuses on inculcating knowledge to learners with little application of practice while other methods of teaching expose learners to active participation in classroom lessons.

Different methods of teaching expose students to active learning (Tumba & Chinda, 2014). Some of them involve the use of modern ways to improve teaching and learning in classroom. For example, Teleconference method of teaching which involves use of computer with Wi-fi connection in the classroom where teacher demonstrates a task on his computer and students receive lectures in their various homes (Kagan, 2019). Another method of imparting knowledge is Peer Assisted Learning, which is the method to be used in this study. Numerous countries of the world among which are United States of America, Australia, Indonesia, New Zealand, United Kingdom and Ghana have made some reforms in the mode of delivery of TVET by introducing different methods of delivery among which are Competency Based Learning Approach (CBLA), Problem Based Learning (PBL), Scenario Based Leaning (SBL) and Peer Assisted Learning Strategies (PALS). These concepts have been found to be productive in all their ramifications (Okoye &Isaac, 2015).

According to Ashlame and Iwanger (2018), Peer Assisted Learning Strategy is an effective teaching and learning strategy for all students. Most students find it interesting to interact with their peer group and they make their queries without hesitation while learning along with their peer group. Hence it becomes an area of thrust and creative approach in the teaching-learning process. Consequently, more systematic work can be promoted to increase the use of peer assisted learning in classrooms. Furthermore, according to Falchikov (2001), Peer Assisted Learning is a teaching strategy that uses students as tutors.

The Federal Government of Nigeria (FGN) has mandated the Federal Ministry of Education under the Department of Science and Technology Education of the ministry with effective repositioning of TVET in line with global trend (FGN, 2019). But the underlining issue is that TVET cannot be repositioned to rub shoulders

with the global trend without effective method of delivery (Okoye & Arimonu, 2016). This issue created a need for research-based practices to provide interventions in the classrooms, workshops and laboratories for all learners. In response to the diversity of need of learners, educators and educational leaders continue to search for ways to help individualize instruction and to provide an environment where students have a more active role in their learning (Tumba & Chinda, 2014). Peer Assisted Learning (PAL), as a research-based strategy that promotes active engagement for all learners in the classroom, workshop or laboratory would go a long way in helping students to have a more active role in their learning.

Several studies such as Falchikov (2001), Ullah, Tabassum and Kaleem (2018) and Ashlame and Iwanger (2018) looked at the importance of an environment with student-to-student interaction in a peer learning model. Kapil and Malini (2018) pointed out the neglected variable in education: the student-student interaction which is referred to as peer assisted learning.

Despite the fact that several studies such as Ashlame and Iwanger (2018), Kapil and Malini (2018) and Ullah, Tabassum and Kaleem (2018) were conducted on Peer Assisted Learning, the researcher observed that there is no known empirical study that was conducted on Peer Assisted Learning in Automobile Technology in Nigerian context, especially at Colleges of Education level. In view of the above, the researcher proposes to fill in this gap.

Gbollie (2017) defined performance as the learning outcomes which include knowledge and skills that are acquired through course of study within and outside the classroom situation. According to Shahazadi and Ahmad (2011), academic performance entails successful academic progress attained through effort and skill. Performance is one of the key gauges for measuring learning outcomes. But good performance can easily be attained when students are highly interested in the subject, method of teaching and the teacher himself.

STATEMENT OF THE PROBLEM

Federal Colleges of Education (Technical) students upon graduation are supposed to have three options. These options according to the National Policy on Education (FGN, 2013) is to either secure employment in the industries, pursue further education in Universities of Technology or set up their own business and become self-reliant. Unfortunately, despite all effort by the government to ensure qualitative education at the Federal Colleges of Education (Technical) and bring about high quality products both in academic and employability, there have been persistent reports of high rate of incompetency in using automotive diagnostic tools among graduates of the Federal Colleges of Education (Technical) (Ekpiken & Ukpabio, 2014; Adesope, Oke & Odekunle, 2018; UNESCO-UNEVOC, 2019). One probable cause of this incompetency of students to meet their expectations during studies and after graduation in recent years according to Cyril (2014); Okoye and Arimonu (2016); Adesope, Oke and Odekunle (2018) is partly due to teaching methods employed by teachers to teach the students. They further observed that in most Federal Colleges of Education (Technical), the teaching methods used in teaching are mostly lecture and demonstration methods. According to Nwosu and Micah (2017), the use of these traditional teaching methods to teach in schools reduces the ability of students to acquire the necessary expected skills and grasp relevant concepts to be able to perform effectively.

Several studies such as Sobral (2002), Yiep (2016) and Ho (2018) have revealed the effectiveness of Peer Assisted Learning Strategies (PALS) in improving students' skills in many practical related fields of study such as medical related fields and physical sciences. It also benefits students' learning in many ways; which include ability to conduct research, integrate theory and practice, communicate, conduct group work, apply knowledge and skills to solve a problem and develop self-directed studies (Pinho, Mota, Conde, Alves & Lopes, 2015). Yet the effectiveness of PALS in improving students' academic performance in Automobile Technology and other related fields is yet to be established. Hence this study intends to determine the effect of Peer Assisted Learning Strategies on students' performance and interest in using automotive diagnostic tools in Federal Colleges of Education (Technical) in North-east Nigeria.

1.1 Purpose of the Study

The main purpose of this study is to determine the effect of Class-Wide Peer Assisted Learning Strategies on students' performance and interest on the use of automotive diagnostic tools in Colleges of Education in North-east Nigeria. Specifically, the study will seek to:

1. Find the mean difference in the pre-test performance scores of automobile technology students of Federal Colleges of Education (Technical) in Class-Wide PALS group and DMT group on the use of Automotive diagnostic tools.
2. Determine the effect of Class-Wide PALS on academic performance of automobile technology

students of Federal Colleges of Education (Technical) on the use of Automotive diagnostic tools.

3. Compare the academic performance level of automobile technology students of Federal Colleges of Education (Technical) when taught using Class-Wide PALS and DMT on the use of Automotive diagnostic tools.

1.2 Research Questions

To effectively guide the study, the following research questions were raised:

1. What is the mean difference in the pre-test performance scores of automobile technology students of Federal Colleges of Education (Technical) in Class-Wide PALS group and DMT group on the use of Automotive diagnostic tools?
2. What is the effect of Class-Wide PALS on academic performance of automobile technology students of Federal Colleges of Education (Technical) on the use of Automotive diagnostic tools?
3. What is the mean difference in the academic performance score of automobile technology students of Federal Colleges of Education (Technical) when taught using Class-Wide PALS and DMT on the use of Automotive diagnostic tools?

1.3 Hypotheses

Four null hypotheses were formulated to guide the study and were tested at 0.05 level of significance.

1. There is no significant difference in the pre-test mean academic performance score of students taught with Class-Wide PALS and those taught with DMT on the use of Automotive diagnostic tools in Federal Colleges of Education (Technical) in North-east Nigeria.
2. There is no significant difference between the pretest and posttest academic performance score of the CWPALS group on the use of Automotive diagnostic tools in Federal Colleges of Education (Technical) in North-east Nigeria.
3. There is no significant difference between the pretest and posttest academic performance of the DMT group on the use of Automotive diagnostic tools in Federal Colleges of Education (Technical) in North-east Nigeria.
4. There is no significant difference between the mean academic performance of students taught with Class-Wide PALS and those taught with DMT on the use of Automotive diagnostic tools in Federal Colleges of Education (Technical) in North-east Nigeria.

1.4 Significance of the Study

This study will be beneficial to both students and teachers. Furthermore, it would add to the existing body of knowledge on how best to improve students' performance and interest in Automobile Technology Education in this country.

Students of Automobile Technology Education in Federal Colleges of Education (Technical) through the findings of this study and recommendations that will be made thereafter, would begin to have a better understanding of themselves and their capabilities and see that they can all have the needed skills in using automotive diagnostic tools despite their individual differences. This would help to build their self-confidence and get them always prepared for meaningful learning.

Teachers would also come to understand students' different intelligences/learning styles and so be able to channel teaching through students themselves so that they will be able to help one another to be successful in school and in life.

RESEARCH METHODS AND PROCEDURES

This study adopted a true-experimental research design. True experiments comprise the most rigorous and strong experimental designs because of equating the groups through random assignment (Creswell, 2014). The study was conducted in second semester of 2020 academic year in Federal College of Education (Technical) Potiskum in Yobe State. A total enrolment of fifty two (52) participants comprised the population of this study. They were NCEIII students enrolled in the two Federal Colleges of Education (Technical) in Yobe and Gombe States. Twenty-four (24) students were randomly selected from Federal College of Education (Technical) Potiskum in Yobe State for the two groups. Federal College of Education (Technical) Potiskum in Yobe State was selected for the study because the NCEIII automobile class of the institution was allowed to be randomly reshuffled to form two groups (experimental and control group). Automotive Diagnostic Rating Scale (ADRS) that consisted of thirty items rating scale test which were adapted from the NPOWER/NADDC auto-mechanic test for the year 2018. A pilot study of the of instrument was conducted in a different Federal College of Education (Technical) outside the study area. A reliability coefficient of 0.81was obtained for the ADRS using Cronbach alpha test method. Numerous standard range values for a suitable level of reliability have been

recommended, with least limits varying from 0.5 to 0.7 (Neuendorf, 2011). The ADRS was judged to have internal consistency of reliability above the recommended lower limits range.

The study took place in Federal College of Education (Technical) Potiskum in Yobe State. The CWPALS approach was used as method of treatment in Experimental group while DMT approach was employed in the control group for the purpose of the experimental study. Two (2) automobile technology lecturers of the college were trained using a tutor manual which described the process step-by- step. After training, the lecturers were assigned a group to work with in tutoring rooms for the designated lesson periods.

TREATMENT PROCEDURES IN THE USE OF AUTOMOTIVE DIAGNOSTIC TOOLS

Based on the two groups the students were randomly assigned to CWPALS group and the DMT group. There are twelve (12) students in the CWPALS group and 12 students in the DMT group, yielding twenty-four (24) subjects for the whole experiment conducted in the study. However, a pretest was conducted on both the two groups prior to the commencement of the lessons. Trained peer tutors were chosen as volunteers and given the opportunity to serve as tutor/coach in the CWPALS group. The peer tutors volunteer were ranked and selected based on their ability in the pretest. The Class-Wide Peer-Assisted Learning was implemented and conducted during regular scheduled for the course; workshop practice II instruction for one hundred and eighty minutes per day, once a week, for six weeks. On the other hand, the DMT (Normal instructional strategy) was implemented in the control group for the same lesson periods similar to that in the CWPALS group. The instructions were conducted based topics selected from NCCE curriculum. A posttest was administered based on the modified version of the ADRS on the topics taught during the experiment.

DATA ANALYSIS

The pretest and posttest data collected were further entered into Statistical Package for Social Science (SPSS) version 21 for PC Windows and analyzed. The analyzed data were revealed in the form of Mean, Standard Deviation, t-test based on the four (4) null hypotheses respectively.

RESULTS OF ANALYSIS

The four null hypotheses that guided this study were tested at 0.05 alpha value. The analysis of each hypothesis was presented as follows:

Hypothesis 1

Ho1: There is no significant difference in the pre-test mean academic performance score of students taught with Class-Wide PALS and those taught with DMT on the use of Automotive diagnostic tools in Federal Colleges of Education (Technical) in North-east Nigeria.

The test of this hypothesis is presented in Table 1. The table reveals that the calculated significance value 0.403 is more than the cut-off 0.05 significance level. This means that there is no significant difference between the performance scores of students taught the Use of Automotive Diagnostic Tools using Class-Wide PALS and those taught the same concepts using DMT at the pre-test level of experimental and control group, since the significance value is less than the confidence level (sig < 0.05). For that, the null hypothesis was accepted, which shows that the experimental group (Class-Wide PALS) and the control group (DMT) performed at the same level.

Table 1: Pretest analysis of Students in Experimental and Control groups for the use of Automotive diagnostic tools in Federal Colleges of Education (Technical) in North-east Nigeria.

Teaching method	N	Mean	SD	Df	t	Sig.
Class-Wide PALS **DMT**	12 12	38.40 35.00	11.18 8.10	22	0.854	0.403*

* Not Significant at 0.05; alpha value; N = 24; df = 22.

Key

N- Number of students

SD- Standard Deviation

df- Degree of freedom

sig- Significant Value

t- value of t-cal.

Hypothesis 2

Ho2: There is no significant difference between the pretest and posttest academic performance score of the

CWPALS group on the use of Automotive diagnostic tools in Federal Colleges of Education (Technical) in North-east Nigeria.

The test of this hypotheses is presented in Table 2. The result shows that mean academic performance of the CWPALS group in pretest was 38.40 with standard deviation of 11.18, while in posttest, same CWPALS group had a mean of 86.60 with standard deviation of 5.31. Therefore, the mean difference in the academic performance of the CWPALS group before and after the experiment was 48.2. This indicated that the student academic performance score was higher in the posttest. The table also revealed that the difference between the performance of the CWPALS group in the pretest and posttest was significant, because the P value was less than the confidence level ($P < 0.05$). Hence the null hypotheses was rejected.

Table 2: t-test Result for the Mean Difference Between the Academic Performance of only the CWPALS Group in Pretest and posttest the use of Automotive diagnostic tools in Federal Colleges of Education (Technical) in North-east Nigeria.

Experimental Group (CWPALS) Statistics							
	Tests	**N**	**Mean**	**Std. Dev**	**df**	**t**	**Sig**
Class-Wide PALS Group	**Pretest**	12	38.4025	11.18	22	13.49	0.000*
	Posttest	12	86.5975	5.31			

*Significant at 0.05; alpha value; N =24; df = 22.

Hypothesis 3

Ho3: There is no significant difference between the pretest and posttest academic performance of the DMT group on the use of Automotive diagnostic tools in Federal Colleges of Education (Technical) in North-east Nigeria.

The test of this hypotheses is presented in Table 3. The result shows that mean academic performance of the DMT group in pretest was 35.00 with standard deviation of 8.10, while in posttest, same DMT group had a mean of 39.24 with standard deviation of 9.75 Therefore the mean difference in the academic performance of the DMT group before and after the experiment was 4.24. This indicated that the student academic performance score was relatively low in the posttest. The table also revealed that the difference between the performance of the DMT group in the pretest and posttest was not significant, because the P value was higher than the confidence level ($P > 0.05$). Hence the null hypotheses were accepted.

Table 3: t-test Result for the Mean Difference Between the Academic Performance of only the DMT Group in Pretest and posttest the use of Automotive diagnostic tools in Federal Colleges of Education (Technical) in North-east Nigeria.

Experimental Group (CWPALS) Statistics							
	Tests	**N**	**Mean**	**Std. Dev**	**df**	**t**	**Sig**
DMT Group	**Pretest**	12	35.00	8.10	22	22.00	0.259*
	Posttest	12	39.24	9.75			

* Not Significant at 0.05 alpha value; N = 24; df = 22

Hypothesis 4

Ho4: There is no significant difference between the mean academic performance of students taught with Class-Wide PALS and those taught with DMT on the use of Automotive diagnostic tools in Federal Colleges of Education (Technical) in North-east Nigeria.

The test of this hypothesis is presented in Table 2. The table reveals that the calculated significance value 0.000 is less than the cut-off 0.05 significance level. This means that there is significant difference between the performance scores of students taught the Use of Automotive Diagnostic Tools using Class-Wide PALS and those taught the same concepts using DMT at the post-test level of experimental and control group, since the significance value is less than the confidence level ($sig < 0.05$). For that, the null hypothesis was rejected, which shows that the experimental group (Class-Wide PALS) performed better than the control group (DMT) because there is a significant difference in the mean performance of the two groups. The mean scores of the two groups in the performance scores are; Class-Wide

PALS (mean = 86.60, SD = 5.31) and DMT (mean = 39.24, SD = 9.75; t = 14.77). The magnitude of the differences in the means is (mean difference = 47.36). Therefore, the null hypothesis was rejected.

Table 4. t-test Result of Students' Performance Scores in Experimental (Class-Wide PALS) and Control Groups (DMT).

Teaching method	N	Mean	SD	Df	t	Sig.
Class-Wide PALS **DMT**	12 12	86.60 39.24	5.31 9.75	22	14.77	0.000*

* Not Significant at 0.05 alpha value; N = 24; df = 22

DISCUSSION OF RESULTS

CWPALS has proved to be an effective instructional strategy on the use of Automotive diagnostic tools in Federal Colleges of Education (Technical) in North-east Nigeria. Table 1 reveals the finding based on research hypothesis one above, which showed that there is no significant difference in the mean pretest academic performance scores of students of Federal Colleges of Education (Technical) in North-east Nigeria for both the CWPALS group and the DMT group before administering the treatment. Numerous previous studies has confirmed this finding; for instance, the findings are in line with the findings of Havens and Williams (2019) who conducted a study to ascertain the effect of Peer-Assisted Learning Strategies (PALS) in Universities reported that, there was no difference in the mean performance of the subjects at the pre-test between the experimental and control group; the subject performed nearly the same before the treatment. This is also in line with the findings of Manzoor (2014) who in a study titled Peer Assisted Versus Expert Assisted Learning: A Comparison of Effectiveness in Terms of Academic Scores, stated that, the performance of students in both experimental and control groups were the same at the pre-test level. The findings is also in line with Scott (2015) whose findings revealed there was no significant different in the two pretest learning achievement scores of elementary pupils in grade 1 classes prior to receiving instruction using class wide peer tutoring (CWPT) and their usual mode instruction. Beside, Wood, Mustian, and Cooke (2012) corroborated this finding, although the effect of digital scaffolding instructional strategy was tested on secondary school students' achievement scores.

Furthermore, the result of the analysis in Table 2 disclosed that there is a significant difference between the mean pretest and posttest performance scores of students that were taught using CWPALS in the use of automotive diagnostic tools as it was earlier hypothesized. This implies the effectiveness of CWPALS on automobile students. Supporting this finding; Sabitu & Terver (2016) revealed that slow learners taught by peer tutors using CWPALS performed significantly better than those taught by the teachers using teacher led lecture method in a chemistry class. Contrary to this finding, work done by Scott, (2015) had reported from his study that there is no significant different in the learning achievement scores of fifth grade elementary pupil in experiment and control group with only higher increase in mean score occurred in reading, vocabulary and comprehension of the pupils in experimental group. The two different means of results obtained could be due to the treatment administered in the experimental group.

The result of this study also revealed that class-wide PALS is a good technical instructional strategy that leads to high performance. This was evident in the performance mean scores students of automobile technology in federal colleges of education (technical) in north-east Nigeria. This finding is in agreement with the findings of Robinson, Schofield, Steers-Wentzell, (2005) that evaluated the effectiveness of PALS in promoting mathematic problem solving revealed that the the control group have pretest achievement scores.

Lastly, this study revealed that there is significant difference in posttest academic performance scores in the use of automotive diagnostic tools between those that were taught using CWPALS and those that were taught using DMT instructional approach. This implies that the CWPALS is highly effective in teaching automobile technology especially the use of automotive diagnostic tools as sampled in this study. This finding has confirmed Scott, (2015), Starr (2009) & Austin (2008) which revealed a significant academic performance of students that were taught using CWPALS. Contrary to this finding, Mathes, Torgesen, Clancy-Menchetti, Santi, Nicolas, Robinson, & Grek, (2003) compared the effect of teachers directed and peer assisted instruction in secondary school mathematics class they found that those taught with teacher directed instruction significantly performed more than those that were taught through CWPALS. However, those in the CWPALS performed significantly higher than those in

the control group. This could be due to the treatment administered on the subjects in the groups.

CONCLUSION

Peer Assisted Learning strategy was found as one of the instructional strategies that could be used to boast the academic performance of automobile technology students in different concepts of automotive diagnostics. Students in the experimental group tend to do better than their counterparts in the control group. Peer assisted learning strategy as used in this study is one of the strategy in the teaching-learning process and could contribute in improving persistent poor academic performance in auto workshop practice II amongst NCE III students of federal colleges of education (technical) in north-east, Nigeria. Hence, automobile technology teachers should combine class-wide peer assisted learning strategy in their instructional method to enhance the academic performance of their students.

RECOMMENDATIONS

Based on the findings the study recommends as follows:

1. Government should organize Seminars/Workshops to train automobile technology lecturers in federal colleges of education (technical) on the knowledge and skills of effective implementation of CWPALS in schools since it facilitates academic performance in students.
2. Teacher education colleges and faculties of education in Nigerian Universities should incorporate CWPALS as part of methodologies in their curriculum so that prospective school teachers and FCE (T) lecturers will acquire basic skills for design and implementation of class-wide peer-assisted learning programmes.
3. Lecturers of automobile technology in Federal Colleges Education (Technical) should allow and encourage their students to take active role by embracing Class-Wide Peer Assisted Learning Strategy during their lesson.

REFERENCES

[1] Adesope, A. O., Oke, A. A. & Odekunle A. A. (2018). Restructuring Nigeria Higher Education (Colleges of education) for Sustainable Development. Journal of Advanced Academic Research, 4(11), 65-74.

[2] Ashlame, P. A. & Iwanger, R. S. (2018). Effect of Peer Tutoring Instructional Strategy on Achievement of Basic Science and Technology Students with Learning Disabilities in Nasarawa State, Nigeria. East African Scholars Journal of Education, Humanities and Literature, 1(2): 47-54.

[3] Austin, J. (2008). The Effects of Peer Tutoring on Fifth-Grade Students' Motivation and Learning in Math Problem-Solving. Master of Science in Education thesis, The State University of New York College at Brockport.

[4] Bisalla, A. M. & Adeyemi, A. A. (2016). Reforming Technical and Vocational Education for Industrial Revolution. International Journal for Innovative Social and Science Education Research. 4(1), 8-13.

[5] Costantini, S. T. (2015). The Impact of Peer Tutoring Strategies on Student Learning in Social Studies. A Master's Thesis Submitted to Department of Curriculum Instruction, State University of New York.

[6] Creswell, J. W. (2014). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. Thousand Oaks: SAGE Publications, Inc.

[7] Cyril, M. U. (2014). Effects of Computer-Assisted Instruction and Demonstration Method of Teaching Automobile Technology in Federal Colleges of Education (Technical) in North-Eastern Nigeria. International Journal of Science and Research, 5(3), 1325-1329.

[8] Ekpiken, W. E. & Ukpabio, G. U. (2014). Repositioning Teacher Education in Nigeria for National Sustainable Development. Journal of Emerging Trend in Educational Research and Policy Studies, 5(5), 585-591

[9] Falchikov, N. (2001). Learning Together Peer Tutoring in Higher Education. London: Routledge Falmer.

[10] Federal Government of Nigeria, (2013). National Policy on Education (NPE). Abuja: NERDC Press.

[11] Federal Government of Nigeria, (2019). Federal Ministry of Education Website. Retrieved on 22/12/19 from http://education.gov.ng/technology-science-education/

[12] Freund, S. H. (2013). The Relationship of Academic Courses and Skills Requirements of Automotive Repair Technicians. PhD Dissertation, Department of Industrial Education, Faculty of Education, Lindenwood University.

[13] Gbollie, H. & Keamu, P. H. (2017). Student Academic Performance: The Role of Motivation, Strategies, and Perceived Factors Hindering Liberian Junior and Senior High School Students Learning. Journal of Educational Research International, 17(1): 1-11

[14] Gill, P. S. (2016). A Textbook of Automobile Engineering I. New Delhi: S. K. Kataria & Sons.

[15] Havens, P. S. & Williams, M. S. (2019). University Peer-Assisted Learning Strategies in the

Humanities. Journal of College Reading and Learning, 49 (3); 160-169

[16] Helderman, J. (2012). Automotive Technology; Principle, Diagnosis and Service. New Jersey: Pearson Education Inc.

[17] Ho, C. L. T. (2018). Peer Tutoring Scheme: A Medical Students Perspectives. Advances in Medical Education and Practice, 18(4); 605-616.

[18] Hussaini, A. (2018). Effect of Scenario-Based Learning on students' performance and interest in Electronics Devices in Science and Technical Colleges in Bauchi and Gombe States [Unpublished Master's Thesis]. Abubakar Tafawa Balewa University, Bauchi, Nigeria.

[19] Kagan, J. (2019). Video Conferencing. Retrieved on 5/2/2020 from http://www.investopedia.com/term

[20] Kapil, Y. & Malini, J. S. (2018). Peer Tutoring an Instructional Strategy: Systematic Approach. Scholarly Research Journal for Humanity Science & English Language. 6(27); 7792-7798.

[21] Kehinde, T. M. & Adewuyi, L. A. (2015). Vocational and Technical Education: A Viable Tool for Transformation of the Nigerian Economy. European Centre for Research Training and Development Online journal 1(2), 22-31, July 2015, www.eajournals.org

[22] Manzoor, I. (2014). Peer Assisted Versus Expert Assisted Learning: A Comparison of Effectiveness in Terms of Academic Scores. Journal of the College of Physicians and Surgeons, 24 (11): 825-829

[23] Mathes, P.G., Torgesen, J.K., Clancy-Menchetti, J., Santi, K., Nicolas, K., Robinson, C., & Grek, M. (2003). A comparison of teacher-directed versus peer-assisted instruction to struggling first-grade readers. The Elementary School Journal, 103(5), 459-479. Retrieved January 14, 2008, from Academic Search Premier database.

[24] Neuendorf, K. A. (2011). Content analysis—A methodological primer for gender research. Sex Roles, 64(3-4), 276-289.

[25] Nwosu, J. & Micah, E. M. (2017). Technical Vocational Education and Training as a Tool for National Sustainable Development in Nigeria. The International Journal for Social Sciences and Humanity Invention, 4(9), 3983-3988.

[26] Okoye, K. R. E. & Isaac, M. O. (2015). Enhancing Technical Vocational Education and Training in Nigeria for Sustainable Development: Competency-Based Training Approach. Journal of Education and Practice, 6(2), 66-69.

[27] Okoye, R. & Arimonu, M. O. (2016). Technical and Vocational Education in Nigeria: Issues, Challenges and Way Forward. Journal of Education and Practice, 7(3), 113-118.

[28] Pinho, L. A., Mota, F. B., Conde, M. V. F., Alves, L. A., & Lopes, R. M. (2015). Mapping Knowledge Produced on Problem-Based Learning between 1945 and 2014: A Bibliometric Analysis. [Electronic version]. Creative Education, 6 576-584.

[29] Robinson, D.R., Schofield, J.W., Steers-Wentzell, K.L. (2005). Peer and cross-age tutoring in math: Outcomes and their design implications. Educational Psychology Review, 17 (4), 327-362. Retrieved January 10, 2007, from Academic Search Premier database.

[30] Sabitu, A. & Terver, T. F. (2016), Impact of Class-Wide Peer-Tutoring Strategy on Secondary School Slow Learners' Performance in Redox Reactions in Funtua, Katsina State, Nigeria. Issues and Ideas in Education 4(2) 83–97.

[31] Scott, N. A. (2007) Attitude Change through Reward of Verbal Behavior. New York, Basic Books Ltd.

[32] Shahazadi, E & Ahmad, Z. (2011). A Study on Academic Performance of University Students. Paper presented at the 8th International Conference on Recent Advances in Statistics: Lahore, Pakistan.

[33] Shehu, I. Y., Birma, M. S., Rufai, A., Eric, E. B., Jibrin, A. L., & Zubairu, A. (2016). Diagnosing and Troubleshooting On-Board Diagnostic (OBD) II Automotive Vehicles in Nigeria. Paper presented at the 2nd National Engineering Conference, Kano, Nigeria. Held between 6th - 8th December at Bayero University.

[34] Sobral, D. T. (2002). Cross Year Peer Tutoring Experience in a Medical School: Conditions and Outcomes for Student Tutor. Medical Education, 36(11); 1064-1070.

[35] Starr, A. S. (2009). Peer Tutoring as an Effective Instructional Strategy to Promote a Collaborative Envrionment with Learning as a Social Process to Enhance Reading Achievement: Students as.

[36] Starr, S. A. (2009). Peer Tutoring as an Effective Instructional Strategy to Promote a Collaborative Environment with Learning as a Social Process to Enhance Reading Achievement: Students as teachers, Teachers as Facilitators. Submitted to Northern Michigan University.

[37] Tumba, I., & Chinda, P. D. (2014). Comparative Effect of Teaching Methods Used for Teaching Skills in Radio, Television and Electronic

Servicing. American International Journal of social sciences.

[38] Udogu, K. C. (2015). Emerging Technology Skills Required by Technical College Graduates of Motor Vehicle Mechanic's Work in Establishing Automobile Enterprises in Anambra and Enugu States of Nigeria [Unpublished master's Thesis], University of Nigeria Nsukka, Enugu, Nigeria.

[39] Ullah, I., Tabassum, R. & Kaleem, M. (2018). Effects of Peer Tutoring on the Academic Achievement of Students in the Subject of Biology at Secondary Level. Education Science Journal, 2(1); 1-11.

[40] UNESCO-UNEVOC, (2019). Technical Vocational Education and Training Country Profile Nigeria. Report on Technical Vocational Education and Training in Nigeria. Bonn: Creative Commons Attribution.

[41] Vijay, P. G. (2017). Technical and Vocational Education and Training (TVET) system in india for sustainable Development. Centre for Innovations. Retrieved on 12/12/2019 from www.educationinnovations.org

[42] Walkup-Amos, T. (2020). Creating Inclusive Music Classrooms Through Peer-Assisted Learning Strategies. Teaching Exceptional Children. Sage Journal, 52(3), 138–146.

[43] Wood, C. L., Mustian, A. L., & Cooke, N. L. (2012). Comparing whole-word and morphograph instruction during computer-assisted peer tutoring on students' acquisition and generalization of vocabulary. Remedial And Special Education, 33(1), 39-47.

[44] Yiep, K. (2016). Peer Tutoring in Physical Education: A Review of Evidence Based Practices. Unpublished Master's Thesis. Department of Physical Education. Faculty of Education; Humboldt State University.