IMPROVEMENT NEEDS OF BUSINESS EDUCATORS FOR MAINTENANCE OF MODERN LEARNING RESOURCES IN BUSINESS EDUCATION PROGRAMME IN UNIVERSITIES IN ANAMBRA AND DELTA STATES

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Abstract

This study investigated improvement needs of business educators for maintenance of modern learning resources in business education programme in universities in Anambra and Delta States. Three research questions were formulated and three null hypotheses were tested for the study. Descriptive survey research design was adopted. The entire population of 79 business educators in four public universities in Anambra and Delta State were studied without sampling. A validated five-point rating scale questionnaire containing 29 items was used for data collection. Cronbach alpha was used to obtain reliability coefficients of 0.76, 0.84 and 0.72 for the different clusters which yielded an overall coefficient of 0.77. The instrument was administered to the respondents with the help of four research assistants. Mean and standard deviation were used to answer the research questions while t-test was used to test the null hypotheses at 0.05 level of significance. Findings of the study revealed that improvement needs for preventive, predictive and corrective maintenance were highly needed by business educators for modern learning resources in business education programme in universities in Anambra and Delta States. There is no significant difference in the mean ratings of business educators in universities in Anambra and Delta States on improvement needs for preventive, predictive and corrective maintenance for modern learning resources in business education programme. The study concluded that business educators in Anambra and Delta States have no choice than to acquire the requisite preventive, predictive and corrective maintenance skills with which to keep modern learning resources in operational state in order to improve the quality of their instructional delivery in universities. The study recommended among others that heads of business education departments in universities should encourage training and retraining programmes for business educators on the maintenance of modern learning resources in order to ensure their availability and utilization for instructional purposes.

Keywords: Maintenance, Modern Learning Resources, Business Education, Business Educators

Introduction

In faculties of education, Nigerian universities offer a four year programme for the Bachelor of Education degree that provides teaching specialists for the society. There are many educational programmes offered in the faculty of education in Nigerian universities among which is business education. Business education is a specialized body of knowledge that positioned students to successfully knock on the doors of the labour market upon graduation. The peculiarity of business education is found in offering lifelong education that will enable students to acquire the necessary job-oriented knowledge, attributes and skills to function independently at a high level in world of work. Hence, Nwazor and Onokpaunu (2016) posited that business education is designed to expose

and equip students with the necessary awareness and skills with which to cope with the intricacies and dynamics of the unpredictable challenges of the business environment

One of the philosophies of business education programme at tertiary education level is the transformation of students to become effective business teachers and high caliber professionals in business establishments upon graduation (National Universities Commission, 2018). The philosophies and blueprints of business education programme are taught in universities by business educators. Business educators are the recognized personnel needed for effective teaching of the pedagogical and employability skills embedded in business education programme in tertiary institutions. According to Aliyu in Okoro (2013), business educators are teachers who have undergone training in business teacher education programmes and are certified to teach business subjects at the secondary school and post-secondary school level. Thus, the familiarization of students with contemporary workplace environment which is the foundation of business education programme falls on the shoulders of business educators in tertiary institutions.

In order for business educators to successfully prepare business education students for the demands of the 21st century workplace, they must integrate and utilize modern learning technologies as their part of their instructional delivery. Modern learning resources are technological resources used by educators to create authentic classrooms and stimulating learning experiences to improve students' interest, academic achievement and retention on subject matters (Bušljeta, 2013). In the same vein, Jabli and Qahmash (2013) asserted that modern learning resources are innovative teaching and learning devices used to meet the learning requirements of students in the technological driven era. Modern learning resources are mostly internet and computer-based resources that enhance instructional delivery and extend instructional experiences beyond the traditional physical boundaries of schools (Cumming, Strnadova and Singh, 2014).

Modern learning resources are sophisticated devices and tools that not only facilitate instructional best practices but also improve the quality and effectiveness of educational institutions. Conceptually, modern learning resources are technological gadgets and softwares that increase students' involvement and interest in the acquisition of hard and soft skills needed in the world of work. These resources such as interactive televisions, smart phones, multimedia projectors, computers, wireless classroom microphone, printers, digital cameras, digital scanners, slide projectors, overhead projectors, photocopiers, internet facilities and 3D visualization tools among others motivate students to come into the instructional process with excitement and vigor for learning. However, the fragile nature and expensive outlay of modern learning resources necessitates the culture of maintenance among educators and students.

In this study, maintenance is an oversight function of preserving and extending the reliability and functionality value of modern learning resources. Alio, Oluka and Idakwo (2021) submitted that maintenance involves all technical and other procedures performed in order to retain the original working condition of a machine or its parts to prolong its value. According to Igwe, Utebor and Olannye (2021), maintenance is an activity that is applied to natural and man-made systems to make such systems remain unimpaired. According to Tijani (2016), maintenance types include preventive (planned) maintenance, corrective maintenance, adaptive maintenance, predictive maintenance and periodic maintenance practices. Having said that, this study anchored on preventive maintenance, predictive and corrective maintenance since they are the major types of maintenance carried out by experts in the world of work.

Preventive maintenance involves a set of activities that are regularly performed on a planned schedule to ensure that modern learning resources continues to function properly without breaking

down. Shakir (2017) opined that preventive maintenance is implemented as a systematic identification and elimination pre-failure situations (potential failure), which can cause unstable working conditions. For example, deletion of corrupted files, conducting anti-virus scan on the system and running software update. The essence of preventive maintenance is to prevent hardware malfunctions and system issues that break down the functionality of modern learning resources. While, preventive maintenance is based on time intervals, predictive maintenance is based on observational moments (Okoh, Roy and Mehnen, 2017) because it is used to determine when hardware and software of machines are moving away normal operational conditions or heading towards failure (Shin and Jun, 2015). According to Onyebuenyi (2018), predictive maintenance involves watching out for danger signal such as unusual noise, danger light indicators, inefficiency of performance and addressing all identified issues promptly before there is a major breakdown.

When modern learning resources collapse in the course of usage, corrective maintenance becomes imminent. Corrective maintenance is carried out when modern learning resources completely ceased to function according to its working standards. Amuka (2013) stressed that corrective maintenance is employed when there is malfunctioning or complete breakdown of the equipment. Similarly, Ameh (2015) defined corrective maintenance as a work or action needed to restore the integrity of damage or deteriorated structure which includes the repair or replacement of defective parts. According to Ado (2014), corrective maintenance involves fault detection, fault isolation, fault elimination and verification of fault elimination through adjusting, aligning, calibrating, reworking, removing, replacing or renovation.

The maintenance of modern learning resources ensures their availability and utilization for real life academic engagements between business educators and students in universities. A cursory visit to departments of business education in universities in Anambra and Delta States shows that modern learning resources such as desktop computers, printers, projectors and photocopiers are faulty and useless for instructional purposes. Sadly, some of these modern learning resources are allowed to rust away under rainy and sunny conditions because there is a serious absence of personal sense of responsibility and poor maintenance culture to keep them in good shape. The consequence of this ugly situation is that business educators would not be able to expose students to the modern gadgets, devices and technologies used by employers of labour before graduation. Identifying areas where business educators need to improve their maintenance on modern learning resources in business education programme is the problem of the study. Against this backdrop, this study focused on improvement needs of business educators for maintenance of modern learning resources in business education programme in universities in Anambra and Delta States.

Purpose of the study

The study is designed to determine the improvement needs of business educators for maintenance of modern learning resources in business education programme in universities in Anambra and Delta States. Specifically, the study sought to determine:

1. improvement needs of business educators for preventive maintenance of modern learning resources in business education programme in universities in Anambra and Delta States
2. improvement needs of business educators for predictive maintenance of modern learning resources in business education programme in universities in Anambra and Delta States
3. improvement needs of business educators for corrective maintenance of modern learning resources in business education programme in universities in Anambra and Delta States

Research Questions

The following research questions guided the study:

1. What are the improvement needs of business educators for preventive maintenance of modern learning resources in business education programme in universities in Anambra and Delta States?
2. What are the improvement needs of business educators for predictive maintenance of modern learning resources in business education programme in universities in Anambra and Delta States?
3. What are the improvement needs of business educators for corrective maintenance of modern learning resources in business education programme in universities in Anambra and Delta States?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

1. There is no significant difference in the mean ratings of business educators in universities in Anambra and Delta States on improvement needs for preventive maintenance of modern learning resources in business education programme
2. Business educators in universities in Anambra and Delta States do not differ significantly in their mean ratings on improvement needs for predictive maintenance of modern learning resources in business education programme
3. There is no significant difference in the mean ratings of business educators in universities in Anambra and Delta States on improvement needs for corrective maintenance of modern learning resources in business education programme

Method

This study adopted descriptive survey research design. The entire population of 79 business educators in the four public universities in Anambra and Delta States were studied without sampling. The instrument for the data collection is a structured and validated questionnaire that is divided into two different sections. Section A of the instrument contained personal information of the respondents and Section B is made up of questionnaire items generated from the literature reviewed which are clustered into three parts; B1 - B3. B1 contains 10 items on improvement needs of business educators for preventive maintenance of modern learning resources, B2 contains 10 items on improvement needs of business educators for predictive maintenance of modern learning resources and B3 contains nine items on improvement needs of business educators for corrective maintenance of modern learning resources

The questionnaire is structured on a five point rating scale of Very Highly Needed (VHN), Highly Needed (HN), Moderately Needed (MN), Slightly Needed (SN) and Not Needed (NN). A pilot test was conducted to establish the internal consistency of the instrument by administering it to 15 business educators in universities in Edo State which were not part of the study and the data collected were analyzed using Cronbach alpha was used to obtain reliability coefficients of 0.76, 0.84 and 0.72 for the different clusters with an overall coefficient of 0.77. The researchers administered the instrument to the respondents in their offices with the help of four research assistants. Out of the 79 copies of the questionnaire administered, only 68 copies (representing 86 percent) were successfully retrieved and used for data analysis.

Mean and standard deviation were used to answer the research questions and determine the homogeneity or otherwise of the respondents' views. The decision on the research questions was

based on the real limits of numbers. Therefore, items with mean ratings of 1.00 - 1.49 are rated Not Needed (NN), those with 1.50 - 2.49 are Slightly Needed (SN), items with mean ratings of 2.50 – 3.49 are Moderately Needed (MN), 3.50 – 4.49 are rated Highly Needed (HN) and mean ratings of 4.50 - 5.00 are Very Highly Needed (VHN). For testing the null hypotheses at 0.05 level of significance, t-test was employed.

Results

Research Question 1

What are the improvement needs of business educators for preventive maintenance of modern learning resources in business education programme in universities in Anambra and Delta States?

Table 1

Respondents' mean ratings on the improvement needs of business educators for preventive maintenance of modern learning resources in business education programme in universities in Anambra and Delta States

S/N	Improvement needs for preventive maintenance	$\overline{X}$	SD	Remarks
1	inspecting photocopiers for signs of deterioration before use	4.63	.86	Very Highly Needed
2	periodic installation of software update on computers for efficiency	4.80	.53	Very Highly Needed
3	periodic inspection of the operating system of computers before use	4.12	.72	Highly Needed
4	complete shutdown of internet facilities when not in use	2.27	.49	Slightly Needed
5	servicing of wireless classroom microphones to detect faults before use	3.89.81		Highly Needed
6	protecting interactive televisions from power surge	4.31	.50	Highly Needed
7	carrying out regular tests on the functionality of interactive televisions before use	3.96	.44	Highly Needed
8	dusting computers and its accessories before using them	2.34	.68	Slightly Needed
9	complete covering of scanners when not in use	3.83	.89	Highly Needed
10	regular oiling of photocopiers and its parts to enable them function effectively	4.05	.55	Highly Needed

Data in Table 1 show that two out of the 10 items listed on improvement needs for preventive maintenance were very highly needed by respondents with mean ratings of 4.63 and 4.80 while six items were highly needed with mean ratings ranging from 3.83 to 4.31 and the remaining two items were slightly needed with mean ratings of 2.27 and 2.34. The cluster mean score of 3.82 indicates that improvement needs for preventive maintenance were highly needed by business educators for

modern learning resources in business education programme in universities in Anambra and Delta States. The standard deviations for all the items are within 0.44 to 0.89. This shows that the respondents are not wide apart in their ratings.

Research Question 2
What are the improvement needs of business educators for predictive maintenance of modern learning resources in business education programme in universities in Anambra and Delta States?

Table 2
Respondents' mean ratings on the improvement needs of business educators for predictive maintenance of modern learning resources in business education programme in universities in Anambra and Delta States

S/N	improvement needs for predictive maintenance	$\overline{X}$	SD	Remarks
11	creating bootlog to identify sources of failure of photocopiers	3.89	.66	Highly Needed
12	detecting corrupt media from device manager of smartphones	3.72	.48	Highly Needed
13	detecting signals of breakdown of digital cameras	3.64	.30	Highly Needed
14	detecting technical problems from drivers of computers	4.11	.68	Highly Needed
15	tracing hardware faults of overhead projectors	3.93	.57	Highly Needed
16	identifying parts of printer that require system update	3.76	.39	Highly Needed
17	detecting over-voltage conditions affecting the functionality of interactive televisions	4.68	.60	Very Highly Needed
18	acting on the displayed screen error messages arising from system failure of computer and its accessories	4.87	.45	Very Highly Needed
19	interpreting displayed screen error messages arising from system failure of computers and its accessories	4.90	.62	Very Highly Needed
20	detecting under-voltage conditions affecting the functionality of multimedia projectors	4.65	.53	Very Highly Needed

Data in Table 2 show that four out of the 10 items listed on improvement needs for predictive maintenance were very highly needed by respondents with mean ratings of 4.65 and 4.90 while the remaining six items were highly needed with mean ratings ranging from 3.64 to 4.11. The cluster mean score of 4.22 indicates that improvement needs for predictive maintenance were highly needed by business educators for modern learning resources in business education programme in universities in Anambra and Delta States. The standard deviations for all the items are within 0.30 to 0.68. This shows that the respondents are not wide apart in their ratings.

Research Question 3
What are the improvement needs of business educators for corrective maintenance of modern learning resources in business education programme in universities in Anambra and Delta States?

Table 3
Respondents' mean ratings on the improvement needs of business educators for corrective maintenance of modern learning resources in business education programme in universities in Anambra and Delta States

S/N	improvement needs for corrective maintenance	$\bar{X}$	SD	Remarks
21	Removing faulty parts of photocopier affecting its efficiency	4.69	.53	Very Highly Needed
22	Upgrading components of overhead projectors that are not working efficiently	4.81	.86	Very Highly Needed
23	replacing rusty components of multimedia projectors	3.72	.55	Highly Needed
24	replacing faulty hardwares of digital scanners	4.03	.73	Highly Needed
25	rectifying poor quality picture of interactive televisions	4.18	.84	Highly Needed
26	fixing sound issues of wireless classroom microphones	4.25	.62	Highly Needed
27	dissembling printers to find faulty components	4.37	.79	Highly Needed
28	deleting programs that affect the efficiency of computers	3.84	.50	Highly Needed
29	fixing faults in the mother boards of computers	4.46	.81	Highly Needed

Data in Table 3 show that two out of the nine items listed on improvement needs for corrective maintenance were very highly needed by respondents with mean ratings of 4.69 and 4.81 while the remaining seven items were highly needed with mean ratings ranging from 3.72 to 4.46. The cluster mean score of 4.26 indicates that improvement needs for corrective maintenance were highly needed by business educators for modern learning resources in business education programme in universities in Anambra and Delta States. The standard deviations for all the items are within 0.50 to 0.86. This shows that the respondents are not wide apart in their ratings.

Hypothesis 1
There is no significant difference in the mean ratings of business educators in universities in Anambra and Delta States on improvement needs for preventive maintenance of modern learning resources in business education programme

Table 4
t-test analysis of mean ratings of business educators in universities in Anambra and Delta States on improvement needs for preventive maintenance of modern learning resources in business education programme

Variable	N	$\bar{X}$	SD	df	t-value	p-value	Decision
Anambra	38	63.84	5.09	66	1.26	0.833	Not Significant
Delta	30	59.32	4.13				

Table 4 shows that there is no significant difference in the mean ratings of business educators in universities in Anambra and Delta States on improvement needs for preventive maintenance for modern learning resources in business education programme. This is shown by the p-value of 0.833, which is greater than the significance level of 0.05. The null hypothesis of no significant difference between the two groups is therefore accepted.

Hypothesis 2

Business educators in universities in Anambra and Delta States do not differ significantly in their mean ratings on improvement needs for predictive maintenance of modern learning resources in business education programme

Table 5

t-test analysis of mean ratings of business educators in universities in Anambra and Delta States on improvement needs for predictive maintenance of modern learning resources in business education programme

Variable	N	$\bar{X}$	SD	df	t-value	p-value	Decision
Anambra	38	71.05	6.84	66	1.77	0.136	Not Significant
Delta	30	64.91	5.50				

Table 5 shows that there is no significant difference in the mean ratings of business educators in universities in Anambra and Delta States on improvement needs for predictive maintenance for modern learning resources in business education programme. This is shown by the p-value of 0.136, which is greater than the significance level of 0.05. The null hypothesis of no significant difference between the two groups is therefore accepted.

Hypothesis 3

There is no significant difference in the mean ratings of business educators in universities in Anambra and Delta States on improvement needs for corrective maintenance of modern learning resources in business education programme

Table 6

t-test analysis of mean ratings of business educators in universities in Anambra and Delta States on improvement needs for corrective maintenance of modern learning resources in business education programme

Variable	N	$\bar{X}$	SD	df	t-value	p-value	Decision
Anambra	38	89.14	6.73	66	1.68	0.104	Not Significant
Delta	30	70.35	5.99				

Table 6 shows that there is no significant difference in the mean ratings of business educators in universities in Anambra and Delta States on improvement needs for corrective maintenance for modern learning resources in business education programme. This is shown by the p-value of 0.104, which is greater than the significance level of 0.05. The null hypothesis of no significant difference between the two groups is therefore accepted.

Discussion of Findings

Findings of the study revealed that improvement needs for preventive maintenance were highly needed by business educators for modern learning resources in business education programme in universities in Anambra and Delta States. The improvement needs of business educators for preventive maintenance of modern learning resources are inspecting of photocopiers for signs of deterioration before use, periodic installation of software update on computers for efficiency, periodic inspection of the operating system of computers before use, carrying out regular tests on the functionality of interactive televisions before use and regular oiling of photocopiers and its parts to enable them function effectively among others. This finding is in consonance with Igwe, Utebor and Olannye (2021) which reported that preventive maintenance are needed for effective maintenance of modern office technologies in government organizations. The agreement between the findings of the current study and the recent study of Igwe, Utebor and Olannye (2021) that preventive maintenance are needed for effective maintenance of modern office technologies could be due to similarity in research design and population.

This study equally showed that improvement needs for predictive maintenance were highly needed by business educators for modern learning resources in business education programme in universities in Anambra and Delta States. The predictive maintenance improvement needs of business educators on modern learning resources are acting on the displayed screen error messages arising from system failure of computer and its accessories, interpreting displayed screen error messages arising from system failure of computers and its accessories, detecting under-voltage conditions affecting the functionality of multimedia projectors, detecting corrupted media from device manager of smartphones and detecting technical problems from drivers of computers among others. This finding is in tandem with Iorliam (2015) who discovered that educators in colleges of education in Benue State highly require predictive maintenance skills for computer maintenance. The agreement between the findings of the current study and the study of Iorliam (2015) that predictive maintenance are needed for effective maintenance of computers could be due to similarity in purpose of study, research design and population.

Furthermore, the results of the study showed that improvement needs for corrective maintenance were highly needed by business educators for modern learning resources in business education programme in universities in Anambra and Delta States. The corrective maintenance improvement needs of business educators on modern learning resources are installing anti-virus software to remove virus affecting the functionality of computers, removing faulty parts of photocopier affecting its efficiency, upgrading components of overhead projectors that are not working efficiently, fixing faults in the mother boards of computers, fixing sound issues of wireless classroom microphones and rectifying poor quality picture of interactive televisions among others. This supports, the study of Chukwuedo and Nwachukwu (2014) which found that corrective maintenance needs are important skills needed for training prospective electronic technologists in educational institutions. The agreement between the findings of the current study and the study of Chukwuedo and Nwachukwu (2014) that corrective maintenance are needed for effective maintenance of computers could be due to similarity in purpose of study, research design and location.

In another note, the study disclosed that no significant difference exists in the mean ratings of business educators in Anambra and Delta States on the preventive, predictive and corrective maintenance improvement needs on modern learning resources in business education programme in universities. This means that business educators in Anambra and Delta States share the same position on the importance of acquiring preventive, predictive and corrective maintenance skills in

order to keep modern learning resources in standard operational shape before, during and after instructional delivery. This finding was supported by Onajite, Olaniyi, Oyerinde, Onyesom and Aina (2019) which reported that maintenance strategies improve the utilization of instructional materials in schools. The finding that business educators in Anambra and Delta States agree that they require preventive, predictive and corrective maintenance improvement needs on modern learning resources is in agreement with the studies of Ado (2014) and Osaghale (2014) which reported that maintenance strategies does not only prevent the sudden failure of instructional materials but also prolong their lifespan for effective usage in schools.

Conclusion

Based on the findings of the study, the researchers concluded that business educators in Anambra and Delta States have no choice than to acquire the requisite preventive, predictive and corrective maintenance skills with which to keep modern learning resources in operational state in order to improve the quality of their instructional delivery in universities.

Recommendations

1. Educational stakeholders and curriculum planners should integrate preventive, predictive and corrective maintenance skills into business education programme so that business educators and students can have the requisite skills needed for prolong the reliability value of modern learning resources
2. Manufacturing companies should from time to time visit business education departments in universities and inform them about the novel preventive, predictive and corrective maintenance skills used for maintaining modern equipment, devices and technologies in their offices and workshops.
3. Heads of business education departments in universities should encourage training and retraining programmes for business educators on the maintenance of modern learning resources in order to ensure their availability and utilization for instructional purposes.

REFERENCES

Ado, Y.K. (2014). *Skill improvement needs of electrical teachers for the maintenance of electrical laboratory equipment in technical colleges in Kano State*. Unpublished masters' thesis, Department of Vocational Teacher Education, University of Nigeria, Nsukka

Alio, N.A., Oluka, S.N., & Idakwo, M. (2021). Enhancing the maintenance of equipment in mechanical technology workshops for practical skills acquisition in Kogi State technical colleges. *International Journal of Innovative Scientific & Engineering Technologies Research, 9*(4), 58-66

Amen, J. (2015). *Total productive maintenance.* Munich: Carl Hanger Veerlay

Amuka, K. (2013). Promoting skills in science and technology need for acquisition of skills. *Technical Education Journal, 3*(2) 37-42.

Bušljeta, R. (2013). Effective use of teaching and learning resources. *Czech-polish Historical and Pedagogical Journal,* 5(2), 55 – 70

Chukwuedo, S.O., & Nwachukwu, C. E. (2014). Maintenance practices in mobile phones for training prospective electronic technologists. *Journal of Research in National Development, 12*(1), 215-222

Cumming, T., Strnadova, I., & Singh S. (2014). iPads as instructional tools to enhance learning opportunities for students with developmental disabilities. *Action Research, 12*,151–176

Igwe, K.O., Utebor, J.N., & Olannye, V.E. (2021). Extent of availability and maintenance practice of office technologies in government parastatals In Ebonyi State, Nigeria. *International Journal of Innovative Information Systems & Technology Research, 9*(3), 149-160

Iorliam, J.N. (2015). *Skills required for computer maintenance by lecturers in colleges of education in Benue State*. Unpublished masters' thesis, Department of Computer Education, University of Nigeria, Nsukka

Jabli, N., & Qahmash, A. (2013). The benefits and barriers of e-learning in higher education in Saudi-Arabia. *Journal of Emerging Trends in Computing and Information Sciences, 4(11),* 877-880

National Universities Commission (2018). *Benchmark minimum academic standards for undergraduate programmes in Nigerian universities.* Abuja: Federal Republic of Nigeria

Nwazor, J.C., & Onokpaunu, M.O. (2016). Strategies considered effective for transforming business education programmes to the needs of 21st century workplace in Delta State, Nigeria. *African Journal of Education and Practice, 1*(5), 74 – 82

Okoh, C., Roy, R., & Mehnen, J. (2017). Predictive maintenance modelling for through-life engineering services. Procedia CIRP, 59(TESConf 2016), pp. 196-201.

Okoro, J. (2013). Strategies for enhancing the teaching of ICT in business education programmes as perceived by business education lecturers in universities in South South, Nigeria. *International Education Studies, 6(*10), 1-12

Onajite, G.O., Olaniyi, O.N., Oyerinde, D.O., Onyesom, M., & Aina, A.M. (2019). Teachers' utilization of instructional materials for effective teaching of business studies in junior secondary schools in Delta State. *Mediterranean Journal of Social Sciences, 10*(6), 27 – 37

Onyebuenyi, P.N. (2018). *Emerging technological skills required for maintaining digital electronics appliances for self-employment of technical college graduates in Enugu State.* Unpublished masters' thesis, Department of Vocational Teacher Education, Enugu State University of Science and Technology, Nsukka

Oseghale, G.E. (2014). Impact of corrective maintenance strategies on the performance of industrial facilities in selected industrial estates in Lagos State, Nigeria. *American Journal of Engineering Research, 3*(8), 171 – 179

Shakir, A.M. (2017). Computer system's maintenance in a corporate environment. *Problems of Information Technology, 1,* 84–90

Shin, J.H., & Jun, H.B. (2015). On condition based maintenance policy. *Journal of Computational Design and Engineering, 2(*2),119 - 127.

Tijani, S.A. (2016). Lack of maintenance culture in Nigeria: The bane of national development. *Civil and Environmental Research*, *8*(8), 23-30.