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Path Analytical Model of Institutional Factors, Student Variables and Implementation of E-Examination in Universities in South-South Zone Nigeria

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***Abstract* - This study developed a path analytical model for institutional factors (availability of ICT infrastructure, administrative support and technical support services), student variables (digital literacy, attitude towards technology, self-efficacy in technology use) and implementation of e-examination in Universities in South-South Zone Nigeria. Correlational research design was adopted for the study. Three research questions were formulated to guide the study. The population of the study consists of about 43,627 year three students of 2022/2023 session from all the Federal Universities in South-South Nigeria, out of which a sample of 1,309 students was selected for the study. The instrument used for the study was 51-item, modified 4-point likert scale type questionnaire titled ''Institutional Factors, Student Variables and Implementation of E-examination Questionnaire'' (IFSVIEQ). Cronbach co-efficient Alpha reliability method was used to establish the reliability estimate of the instrument, and the coefficient of internal consistency ranged between 0.72 and 0.91. Data collected were analyzed using Path analysis technique at 0.05 level of significance. The results revealed that both institutional factors and student variables collectively and individually predicted the implementation of e-examination in universities. The result also revealed that there was a significant and very strong positive correlation between institutional factors, student variables and implementation of e-examination in universities. The result finally revealed that the proportion of the total direct to total indirect effects of institutional factors and student variables on e-examination implementation indicated that the exogenous variables had more direct effects than indirect effects on e-examination implementation in universities. Based on this, it was recommended among others, that Universities should create and develop a comprehensive ICT plan, install modern computers and network infrastructure so as to enhance effective implementation of e-exam.**

Keywords: Path Analytical Model, Institutional Factors, Student Variables and E-examination.

I. Introduction

In Nigeria, educational Institutions are expected to conduct examination regularly to be able to establish the desired characteristics of their students. For any examination to be credible, it must possess key elements like reliability and validity. These key elements can only be present if the examination conduct followed adequate testing procedures, devoid of malpractices. As an important part of the teaching/learning process, examination allows the teacher to evaluate students during and at the end of the course. (Nnam & Inah2015), notes that examination is a yardstick against which students' competence and progress are formally measured and appraised in the education sector. According to (Knowly, 2020), examination as part of evaluation in education is aimed at determining a learner's level of skills acquisition or intellectual competence and understanding after a given training.

According to (Abah, Honmane, Age & Ogbule, 2022), examinations can be conducted in different ways, though the two major types are the Paper-and-Pencil Test (PPT) and the Electronic Examination (E-exam) type. The first type, PPT, has been the major type of examination used in Nigerian schools. PPT is the traditional assessment format that asks students to use pen/pencil in attempting questions on sheets of paper. In this type of examination, candidates read questions and respond in writing (Oduntan, Ojuawo & Oduntan, 2015). Regrettably however, it is widely believed that PPT is marred with great irregularities including the ever increasing case of examination malpractice, delay in result presentation, increased financial implications in conducting the examination amongst others (Shraim, 2019). This has forced higher education institutions in Nigeria to constantly sought for alternative and more effective examination methods, giving room for electronic exam to be introduced in higher education

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institutions as a means of supplementing or even replacing PPT (Ibrahim, Ba'aba, Ismail & Dawud, 2021), (Amer, 2020) and (Almomani, 2019).

Electronic examination or simply e-exam, which is commonly known as online examination and previously as computer-based assessment, is a type of examination system that involves the conduct of examination through the web or internet. That is, it involves the process by which examinations are delivered, taken and scored electronically. It entails questions being deployed onto computer workstations (intranet and internet) and candidates answering the questions on to the computer, making the testing method completely paperless. The method is an effective, unbiased, and interesting method for assessing students' academic level (Shraim, 2019). The inherent and foreseeable benefits accruable to the Nigerian educational system from the introduction of e-exam cannot be overemphasized. (Nwankwo, Nwosu & Oputa2016), highlighted some of the benefits to include prompt release of result, curbing examination malpractices, being less expensive, enhancement of computer literacy and integration, provision of avenue for implementing the National Policy on Education and enhancement of examination security.

However, despite the numerous benefits of e-exam in Nigeria tertiary institutions, e-exam is still like a dream because of its seeming poor implementation in universities. Evidently, in University of Calabar for instance, the researchers have observed that students don't get to see their results immediately after taking their exams. In some cases, the result may take weeks or even months before they are made available to students. This violates one of the main reasons for introducing e-exam, which is instant access to results. This may give room for alteration of students' results, because the examinees are expected to access their results immediately after the exam so as to prevent human manipulation of results of whatever kind. Cases of students getting fatigued as a result of spending hours under the sun waiting for their turn so as to partake in the examination have been observed by the researchers also, whereas one of the ideas for the introduction of e-exam was to ease the problem usually associated with inadequate examination venues. Examinees complaining about systems going off and on during examination and systems not being sufficient are also issues associated with e-exam, as noticed by the researchers. One wonders what could be responsible for this poor implementation of e-exam.

(Nkwocha, 2018), reported that in the University of Port Harcourt (UNIPORT), adoption of e-exam has been slow because of challenges faced by examinees, which include abrupt shutting down of computer systems and thumbprints that did not march what was captured, thus forcing candidates back home dejectedly without writing their examination. Also, some examinees due to anxiety often mistakenly press the wrong response entry device key (keyboard/touchscreen/mouse) in response to questions which results in error thereby compromising the validity of the examinees' result. In addition to this, (Bukar, Bello &Ibi (2020), also reported that university of Maiduguri has been affected by inadequacy of trained personnel in educating lecturers on the use of computer instructional delivery tools. This has resulted in massive pull back in the acceptance and effective implementation of e-exam in the institution.

Undoubtedly, several investments have been made in the educational sector by successive government and especially after the COVID-19 pandemic, in the area of effective implementation of e-exam in universities in Nigeria. These include; Federal government institutionalization of a "Test Drive" tutorial; which was design to provide candidates with a real world, end-to-end practice run before the date of their scheduled e-exam; The National Universities Commission (NUC), by its position as fund disbursing agent also regulate and control the activities of universities by funding this type of examination system (e-exam) through equipping their e-libraries; The government has also work towards stabilizing electricity supply in universities by providing generating plants through Tertiary Education Trust Fund (TETFunD) to higher Institutions; A website campaign was also introduced by different examination bodies to reduce the challenges associated with effective implementation of e-exam; The campaign explains to candidates a sample of e-exam showing them where and how to navigate through the exam and familiarizing them with the layout and content (Ojuawo & Oduntan, 2016),(Oduntan & Ojuawo, 2018); (Bassey, 2020) and(Adebayo, 2022).

Furthermore, some university managements are not left out, as they do ensure that prospective lecturers must be ICT inclined before they are being employed into the university system. Secondly, lecturers are being trained on educational technologies to enhance their capacity and teaching effectiveness in modern testing techniques, as well as ICT instructors and software designers that will install, maintain and support these systems to overcome the challenges in the area of dearth of qualified computer software designers in the university (Adeyinka & Bashorun, 2012). Some university managements have also gone as far as organizing public relation campaigns and mock e-exams to familiarize and expose students to this new system of examination (Bassey, 2020). Despite these efforts, implementation of e-exam in universities in Nigeria seems not to be efficient and effective.

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It is against this backdrop that the researchers felt there may be some challenging factors (Institutional & Student) influencing the effective implementation of this type of examination in universities in Nigeria and in the South-South in particular. Worth mentioning is the fact that empirical studies on implementation of e-exam in universities are surprisingly scanty. Studies on factors affecting implementation of e-exam appear to be even fewer; in spite of it numerous advantages over PPT. However, in the few available studies, inadequate internet facilities, expensive soft-ware, integrity of result produced, security of examination questions, quality of examination questions, cost of buying data, gender equity, poor maintenance culture, unstable power supply, poor internet connection, computer anxiety among others feature regularly and prominently as the factors that undermine implementation of e-exam in universities (Abubaka & Adebayo, 2014),(Bukar, Bello & Ibi ,2020); (Suryadi & Rahmawati, 2018) and (Abubaka & Abdulahi, 2020).

Likewise, the impacts of the variables that predict implementation of e-exam in universities have hitherto been examined by previous researchers using univariate statistical tools. Others who employed multivariate statistical techniques like multiple linear regression mainly examine the direct effect of the predictor variables on a specified criterion variable without any consideration of the indirect effect which is the interactive relationships among the predictor variables and on the ultimate criterion or outcome variable. Merely comparing the R-squared change pattern and overlooking the interactive relations among variables may give rise to non-holistic findings that portend limitation on sound or solid theory building. This is because human behaviour is complex and subject to change in the presence of intervening variables as many factors directly or indirectly interact simultaneously to produce observed outcomes in our environments.

Since univariate or rudimentary multivariate statistical techniques may not suffice in the presence of intervening variables, this study intends to rely on path analysis, which is a subset of structural equation modeling (SEM) to unravel the relationship among institutional factors, student variables and implementation of e-exam in universities. Path analysis serves as a statistical tool for estimating the presumed causal effect or relationship among a set of predictor variables on one another, and a particular outcome variable through diverse causal pathways on the hypothesized path model. It also offers a more inclusive and realistic analysis capable of providing a holistic and informative insight about the mediating effect of the variables. The researcher strongly believes that this attempt will provide in-depth and better understanding of the state of affairs and the direction to channel efforts towards remedying the situation, if the need arises.

This study therefore sought to understand what the causative paths, the weights (path coefficient), direct and indirect effects and the most meaningful model that exist for predicting factors and variables influencing implementation of e-exam in universities in South-South Nigeria? The institutional factors include: availability of ICT infrastructures, administrative support, and technical support services. While the student variables include: digital literacy, attitude towards technology and self-efficacy in technology use.

II. Research Questions

1. What is the most significant, meaningful and parsimonious causal model of the effects of institutional factors and student variables on implementation of e-exam in universities?
2. What are the composite and relative causal effects of the institutional factors and student variables on implementation of e-exam in universities?
3. What proportions of the total direct to the total indirect effects of the institutional factors and student variables is responsible for the causal explanations of implementation of e-exam in universities?

III. Methodology

Correlational research design was adopted in conducting this study. The population of the study consists of about 43,627 year three students of 2022/2023 academic session from all the federal universities in South-South Nigeria, out of which stratified random and the accidental sampling techniques were used to sample 1,309 students for the study. Data were collected through a 51-item, modified 4-point likert scale type questionnaire titled ‘‘Institutional Factors, Student Variables and Implementation of E-exam Questionnaire’’ (IFSVIEQ). The questionnaire was made up of part A and B. Part A deals with demographic information such as sex, name of institution and department. Part B consist of 51-items, with six items each which collected data for each of the variables which took care of institutional (availability of ICT infrastructures, administrative support and technical support services) and student (digital literacy, attitude towards technology and self-efficacy in technology use) variables. While 15 items collected data for implementation of e-examination. The items were presented in form of questions for students to indicate their level of articulation. The extend of theses articulations ranged from: Strongly Agree (SA) 4-points, Agree (A) 3-points, Disagree (D) 2-points and Strongly Disagree (SD) 1-point. Thus, the magnitude of the points were reversed when the statement are negative. Cronbach co-efficient alpha reliability method was used to establish the reliability estimate of the instrument, and the coefficient of

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internal consistency ranged between .79 and .87 showing acceptable level of consistency.

IV. Results/Discussion

Research Question 1: What is the most significant, meaningful and parsimonious causal model of the effects of institutional factors (availability of ICT infrastructure, administrative support and technical support services) and student variables (digital literacy, attitude towards technology and self-efficacy in technology use) on implementation of e-exam in universities?

In answering this research question, path analysis statistics was deployed, and the results are presented Table 1 and Figure 1.

Table 1: Regression weights of direct paths diagram of both exogenous and endogenous variables in the model

			Unstandardized Estimate	S.E.	C.R.	P-value	Standardized Estimate
Digital literacy	<---	ICT infrastructure	.699	.019	37.121	***	.701
Self-efficacy	<---	Admin support	.078	.020	3.939	***	.111
Digital literacy	<---	Technical support	.281	.032	8.880	***	.168
Self-efficacy	<---	Technical support	.117	.028	4.108	***	.116
E-exam implementation	<---	Digital literacy	.059	.035	1.653	.098	.063
E-exams implementation	<---	Self-efficacy	.188	.041	4.601	***	.121
E-exam implementation	<---	ICT infrastructure	.162	.035	4.694	***	.174
E-exam implementation	<---	Admin support	.186	.029	6.342	***	.171
E-exam implementation	<---	Technical support	.128	.043	2.962	.003	.082
Tech attitude	<---	ICT infrastructure	.899	.012	74.118	***	.889
Tech attitude	<---	Technical support	.173	.020	8.466	***	.102

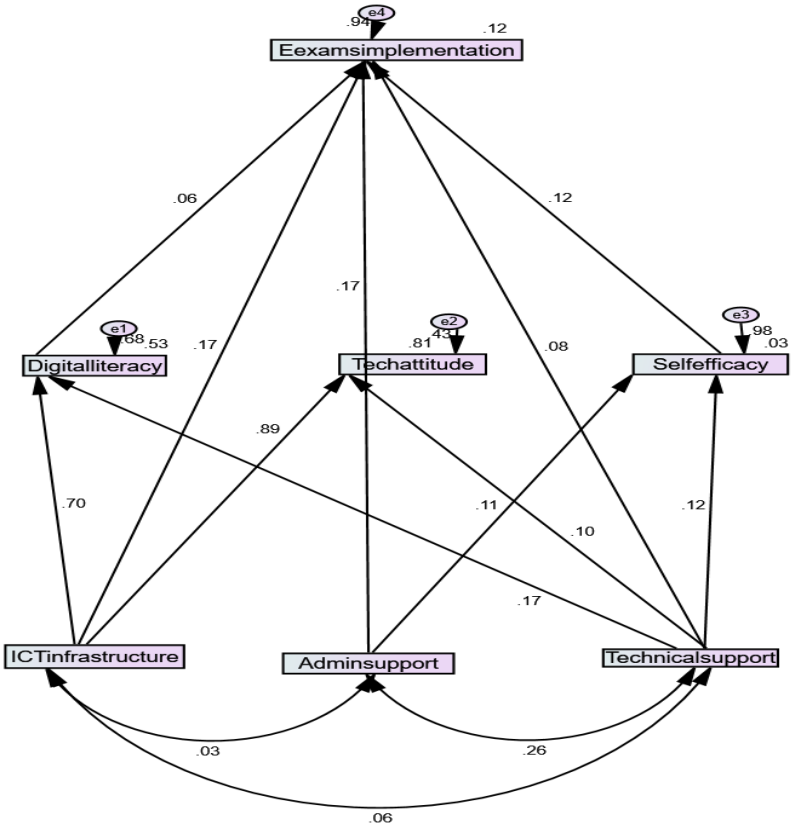

Figure 1: A path diagram showing the relationship between institutional factors and student variables on the implementation of e-exam in universities

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The path analysis was employed to estimate the significant hypothesized path in the model through which the exogenous (institution) factors and the exogenous (student) variables determine the endogenous (implementation of e-exam) variable. The comparative fit indices of Adjusted Goodness of Fit Index (AGFI) > .954, Comparative Fit Index (CFI) > .926, Root Mean Square Error of Approximation (RMSEA) < .044, all surpassed the parameter estimation threshold signifying that the model was plausible as these indices were within appropriate criteria and all the links were explainable within the hypothetical outline. The model was the most parsimonious model and was explained by five direct causal pathways of the exogenous variables (availability of ICT infrastructure, administrative support, technical support services, digital literacy, and self-efficacy in technology use) to the endogenous variable (implementation of e-exam).

The five direct causal pathways to the implementation of e-exam revealed that there was no significant direct positive predictor between digital literacy and implementation of e-exam with a predictive strength of 6 percent (β = -.06) which was not significance at .05 (See Table 1 and Figure 1). While there was a significant direct positive predictor between self-efficacy in technology use and implementation of e-exam with a predictive strength of 12 percent (β = .12) which was significance at .05 level of significance. Technical support services equally emerged as direct positive predictors with the implementation of e-exam having a predictive strengths of 8 percent (β = .08) which was also significance at .05 level of significance, while availability of ICT infrastructure and administrative support also revealed significant direct positive predictors between them and the implementation of e-exam with their respective predictive strengths of 17 percent (β = .17) and 17 percent (β = .17), which was also significance at .05 level of significance. All the combination of the institutional factors and student's variables direct causal pathways combined together explained 12 percent of the variation in implementation of e-exam in universities in South-South Nigeria.

The result also revealed that availability of ICT infrastructure and technical support services also have direct positive predictors with student's digital literacy having predictive strengths of 17 and 70 percent (β = .17 and .70) respectively, which was also significance at .05 level of significance. However, the impact among these two variables accounted for 53 percent of the variation on student's digital literacy. Availability of ICT infrastructure and technical support services in addition have direct positive predictors with student's attitude towards technology having predictive strengths of 89 and 10 percent (β = .89 and .10) respectively, which was also significance at .05 level of significance. However, the impact among these two variables also accounted for 81 percent of the variation on student's attitude towards technology.

The result further revealed that administrative support and technical support services equally have direct positive predictors with student's self-efficacy having predictive strengths of 11 and 12 percent (β = .11 and .12) respectively, which was also significance at .05 level of significance. However, the impact among these two variables also accounted for 3.0 percent of the variation on student's self-efficacy. The result further revealed that there were positive correlations among the exogenous variables to the implementation of e-exam as observed in Figure 9. There was a significant positive weak correlation between availability of ICT infrastructure and administrative support having just 3.0 percent. While there was also a positive fair correlation between administrative support and technical support services having 26 percent of the effect on the endogenous variable. Lastly, a combination of the three variables of availability of ICT infrastructure, administrative support and technical support services has a significant positive weak correlation among them with an effect of 6.0 percent.

Research Question 2: What are the composite and relative causal effects of the institutional factors and student variables on implementation of e-exam in universities? In answering this research question, path analysis statistics was deployed to unravel the relative and composite correlations among the institutional factors and student variables on the implementation of e-exam in universities, and the results are presented in Table 2 and Figure 1.

Table 2: Contribution among the exogenous variables (institutional factors) and exogenous variables (student variables) to the endogenous variable (implementation of e-exam)

Institutional factors and student's variables			Estimate
ICT infrastructure	<-->	Technical support	.062
ICT infrastructure	<-->	Admin support	.035
Admin support	<-->	Technical support	.256

The result in Figure 1 and Table 2 revealed that there were only positive correlations among the exogenous variable to the endogenous variable as observed in figure 1. The result shows that there was a significant positive weak correlation between administrative support and availability of ICT infrastructure on the implementation of e-exam with a 3.5 percent effect. This result implies that a combination of administrative support and availability of ICT infrastructure

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tends to move to same direction which effect led to the implementation of e-exam. Similarly, there was also a significant weak positive correlation between Technical support and ICT infrastructure to the endogenous variable with a 6.2 percent effect which effect also led to the implementation of e-exam; while technical support and administrative support also had a significant fair positive correlation which accounted for a 25.6 percent effect on the implementation of e-exam.

Research Question 3: What proportions of the total direct to the total indirect effects of the institutional factors and student variables is responsible for the causal explanations of implementation of e-exam in universities? In answering this research question, Path analysis statistics was deployed and the results are presented in Table 3.

Table 3: Proportions of total indirect and total direct effects of the institutional factors and student variables responsible for the causal explanations of implementation of e-exam in universities

Indirect Effects

	Technical support	Admin support	ICT infrastructure	Self-efficacy	Digital literacy
Self-efficacy	.000	.000	.000	.000	.000
Digital literacy	.000	.000	.000	.000	.000
Tech attitude	.000	.000	.000	.000	.000
E-exams implementation	.025	.013	.044	.000	.000

Total Direct Effects

Self-efficacy	.116	.111	.000	.000	.000
Digital literacy	.168	.000	.701	.000	.000
Tech attitude	.102	.000	.889	.000	.000
E-exams implementation	.082	.171	.174	.121	.063

The result revealed that there was no indirect effect between self-efficacy and technical support services, digital literacy and technical support services and attitude toward technology and technical support services, while only 2.5 percent indirect effect was observed between technical support services and implementation of e-exam. In a related development, the result also revealed that there was no indirect effect between self-efficacy and administrative support, digital literacy and attitude towards technology and attitude towards technology and administrative support, while only 1.3 percent indirect effect was observed between administrative support and implementation of e-exam. Furthermore, the result further revealed that there was no indirect effect between self-efficacy and availability of ICT infrastructure, digital literacy and availability of ICT infrastructure and attitude towards technology and availability of ICT infrastructure, while only 4.4 percent indirect effect was observed between availability of ICT infrastructure and implementation of e-exam.

The result further went ahead to revealed that there was no indirect effect between self-efficacy and digital literacy and self-efficacy and attitude towards technology and self-efficacy and implementation of e-exams, while, indirect effect was not also found between digital literacy and self-efficacy, attitude towards technology, and implementation of e-exams. Similarly, Table 3 also revealed that the total direct effect between self-efficacy and technical support services produced a total direct effect of 11.6 percent. Furthermore, technical support services, digital literacy, attitude towards technology, and implementation of e-exams, respectively produced 16.8, percent, 10.2 percent, and 8.2 percent. 11.1 percent was also recorded between self-efficacy and administrative support, while there were 17.1 total direct effects was recorded between implementation of e-exam and administrative support. However, there was no direct total effect between student's digital literacy and administrative support, and attitude towards technology and administrative support as well. The result further revealed that there was very strong direct effect between digital literacy and availability of ICT infrastructure (70.1 percent), and attitude towards technology and availability of ICT infrastructure which accounted for 88.9 percent, implementation of e-exam recorded 17.4 percent direct total effect with availability of ICT infrastructure, while no direct total effect was recorded between self-efficacy and availability of ICT infrastructure. Meanwhile self-efficacy and implementation of e-exam recorded 12.1 percent direct total effect between them, and digital literacy and implementation of e-exam also accounted for only 6.3 percent direct total effect between.

V. Conclusion

Based on the result of the study, it was concluded that both the institutional factors (availability of ICT infrastructures, administrative support and technical support services) and student variables (digital literacy, attitude towards technology and self-efficacy in technology use) investigated in this study collectively and significantly

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predicted the implementation of e-exam in universities in South-South Nigeria and they accounted for 12 percent of the variance in implementation of e-exam in universities.

It was further concluded that the institutional factors and student variables individually predicted implementation of e-exam in universities in such a way that availability of ICT infrastructures and administrative support had the greatest predictions, followed by self-efficacy in technology use, digital literacy, technical support services and attitude towards technology respectively.

Finally the study also revealed that an improvement in the institutional factors and student variables will bring a corresponding improvement in the implementation of e-exam in our universities, and vice versa.

VI. Recommendations

On the basis of the findings of the study, the following recommendations were made:

1. Universities should create and develop a comprehensive ICT plan, install modern computers and network infrastructure so as to enhance effective implementation of e-exam.
2. Universities should establish open and transparent communication channels among staff, provide training and development opportunities to them, recognize and appreciate staff efforts, and define administrative staff roles and responsibilities as well. These measures will boost administrative supports in universities, which will lead to increased efficiency in the implementation of e-exam.
3. Universities should establish a dedicated Information Technology (IT) support system for students, faculty and staff; hire experienced technicians and provide training and development, and leverage partnerships to access expertise, resources, and discounts from IT vendors, as these measures would ensure a seamless implementation of e-exam.
4. Universities should integrate technology such as digital skills into the school curriculum, expose students to real-world digital applications such as AI, data analysis, and other cutting-edge digital tools and skills necessary to succeed in today's technology-driven society.
5. In order to boost student's attitude towards technology, school should provide opportunities for students to experiment and explore technology in a supportive environment, foster a mindset that technology can be used to create and solve problems, as well as pair students with tech-savvy mentors who can inspire and guide them gain technological knowledge.
6. In order for students to develop self-efficacy in technology use, the school should help students identify their strengths, weaknesses, and area for technological improvement; as well as regularly assess and discuss students' self-efficacy beliefs.

REFERENCES

[1] Abah, J. A., Honmane, O., Age, T. J. & Ogbule, S. O. (2022). Design of single-user-mode computer-based examination system for senior secondary schools in Onitsha North Local Government Area of Anambra State, Nigeria. *Village Mathematics Educational Review (VMER)* 3 (1), 108 – 134.

[2] Abubakar, A. S. & Abdulahi, A. A. (2020). Challenges of computer based test among senior secondary school students in Zaria Local Government Area of Kaduna State. *African Scholars Journal of Pure and Applied Science (JPAS)*, 18 (9), 1 – 12.

[3] Abubakar, A. S. & Adebayo, F. O. (2014). Using computer based test methods for the conducting of examination in Nigeria: Prospects, challenges and strategies. *Mediterranean Journal of Social Sciences*, 5 (2), 47 – 55.

[4] Adebayo, F. (2022). Candidates list out the advantage and disadvantages for computer-Based UTME Retrieved September, 2022 from www.google.com

[5] Adeyinka, R. & Bashorun, C. (2012). The prospects of e-examination in Nigeria. *Turkish Online Journal of Distance Education (TOJDE)*, 8(4), 125 – 134.

[6] Almomani, O. H. (2019). The attitude of undergraduate students using e-exams for assessment in Jordan. *British Journal of Education*, 7 (9), 14 - 28.

[7] Amer, M. (2020). Effectiveness of using electronic exams in assessment in Saudi Universities: Empirical study, *International Journal of Education Technology and Learning*, 8 (2), 61–69.

[8] Bassey, A. B. (2020). Factors influencing students' performance in computer based testing in Cross River State, Nigeria (Power supply and inadequate computers). *International Journal of Quantitative and Qualitative Research Methods*, 8 (2), 25 – 33.

[9] Bukar, I. B., Bello, S. & Ibi, M. B. (2020). Role of computer in instruction, assessment and administrative delivery of education goals in the University of Maiduguri, Nigeria. *Journal of Education and Practice*, 7 (20), 81 – 82.

[10] Ibrahim, M. M., Ba'aba, H. B., Ismail M., & Dawud, M. A. (2021). An investigation of the factors influencing University students' behavioural intention toward the use of electronic examination system. *Journal of Information Science, System and Technology*, 5 (2), 83 – 101.

ISSN (online): 2581-3048
Volume 8, Issue 9, pp 148-155, September-2024
https://doi.org/10.47001/IRJIET/2024.809018

[11] Knowly, A. (2020). Advantages and disadvantages of online examination system https://onlineexaminationbuilder.com/knowledgecenter .exam.

[12] Nkwocha, P.C. (2018). Basic educational measurement and evaluation: Revised edition. *Owerri: Mercy Divine Publishers*.

[13] Nnam, M. U. & Inah, A. F. (2015). Empirical investigation into the causes, forms and consequences of examination malpractices in Nigerian institutions of higher learning. *International Journal of Novel Research in Humanity and Social Sciences,* 2 (1), 25 – 36.

[14] Nwankwo, S. N., Nwosu, N. N. & Oputa, R. (2016). Administration of computer based testing (CBT) for university admissions in Imo State: Problems and Prospects. *Journal of Resourcefulness and Distinction (JORESDIS),* 13 (1), 49 – 64.

[15] Oduntan, O. E. & Ojuawo, O. O. (2018).Developing of electronic an examination system using a client model. *International Journal of Computer Applications*, 180 (24), 975 – 988.

[16] Oduntan, O. E., Ojuawo, O. O. & Oduntan, E.A. (2015). A comparative analysis of students' performance in paper pencil test (PPT) and computer based test (CBT) examination. *Research Journal of Educational Studies and Review*, 1 (1), 24 – 29.

[17] Ojuawo, T. U. & Oduntan, V. (2016). Thinking about philosophy: A general guide. *Ibadan, Nigeria: Hope press publishers.*

[18] Shraim, K. (2019). Online examination practical in higher education institution: Learners perspectives. *Turkish Online Journal of Distance Education,* 20 (4), 185 – 196.

[19] Suryadi, B. & Rahmawati, Y. (2018). Challenges and opportunities in implementing CBT of national assessment for non-formal education. *Proceedings of the 1st International Conference on Education Innovation (ICEI):* 184 – 194.

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