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RESEARCH ARTICLE

CORRELATION BETWEEN THE COMPUTER BASED ASSESSMENT AND STUDENT'S EXAM ANXIETY

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Abstract

Exam anxiety is an essential component of the educational assessment that has not received much research attention. The integration of information communication technology (ICT) for evaluation purposes in the contemporary education ecosystem of Nigeria has increased. The computer-based assessment (CBA) is an ICT framework that has increasingly been used in educational institutions to assess learners' learning outcomes. There are intimations that the computer-based assessment platform exerts anxiousness among students. The present study examined the CBA as a correlate of examination anxiety among students. A convenient sample of one hundred and fourteen students pooled from public and private tertiary institutions in Anambra State, Nigeria, participated in the study. The respondents completed a self-report measure of the test anxiety scale. The finding revealed a significant positive relationship between the CBA and exam anxiety. The result and recommendations are discussed.

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Introduction:-

Technology is perceived as a dynamic driving force for contemporary education (Buabeng-Andoh, 2019). It has provided the pathway to efficient and all-inclusive learning in recent times. Some educational institutions employ numerous technological tools to disseminate, interact, create, manage information, and train different skills. In particular, information communication technology has become integral to the teaching-learning interaction. In many contexts, the conventional chalkboards have been replaced with digital interactive whiteboards, smart devices such as the iPad has been deployed to facilitate learning during class time, and the flipped classroom approach allows students to watch lectures at their convenience. Also, educational institutions that utilize technological infrastructures such as computer-based tests to assess students learning experiences have increased in recent years.

Assessments are a ubiquitous part of the academic ecosystem essential in evaluating students' knowledge. The continuous evolution in information technology has influenced the conduct of assessments in the educational and non-educational sectors. Indeed, many academic institutions now use computers for assessments to replace conventional pen and paper assessments (Faniran & Ajayi, 2018). Computer-based assessment (CBA) is a growing trend in Nigeria's educational ecosystem. The public and privately-owned tertiary institutions and other bodies, such as the Joint Admission and Matriculation Board (JAMB), employ the platform for various assessments (Okocha et al., 2017; Sanni & Mohammad, 2015). The use of an e-exam simplifies the assessment systems, including generation, execution, evaluation, presentation, and archiving of results. This simplification saves time and money while improving reliability as information communication technology is increasingly utilized in the educational setting. Computer-

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based examination with flexibility, efficiency, and speed is gradually becoming an acceptable standard of administering exams across institutions. Indeed, computer-based assessment is a critical issue in e-learning and have recently attracted huge research attention (Al-Amri & Ali, 2016; Demara et al., 2019; Jawaid et al., 2014; Kim, 2015; Lin & Lai, 2019; Maqableh et al., 2015; Nguyen et al., 2017; Sirianni et al., 2019; Waddell et al., 2012; Yao, 2019). There is a consensus in the literature that the CBA system is preferred for evaluation in many educational institutions in the world.

Accordingly, CBA is currently trending in the educational sector because it provides many advantages to the academics and practitioners like comprehensive grading, test security, personalized feedback, cost and time reduction, speed of results, interactive activities, and distance learning (Aojula et al., 2006; Fuentes et al., 2014; Hassanien et al., 2013; Kalogeropoulos et al., 2013; Sangmeister, 2017). Indeed, CBA is a crucial alternative to the conventional pen and paper (P&P) evaluation and exams, facilitating educational goals at lower costs (Geraili-Afra et al., 2018). Although the pen and paper method remain a sound evaluation system in educational systems, indications suggest that the conventional approach is threatened by the growing demand for a seamless and robust innovative framework in student evaluation. These innovations in academic assessments can meet the ever-increasing student's educational needs in contemporary society. However, growing intimation suggests that the adoption of the CBA for assessments might not entirely be suitable for every student, especially at the undergraduate level. Notably, previous research had noted that the use of electronic assessment in the education system is a new development that triggers anxiety (Sulistyaningsih, 2016). The present study is aimed to examine the relationship between the use of e-assessment and exam anxiety.

Exam anxiety is a psychological construct that reflects an affective state in which individuals experience extreme distress and anxiousness in evaluation situations. Exam anxiety is an essential component in the educational ecosystem that has been implicated in poor physical health (Zhang & Qin, 2020), students' mental well-being, and academic outcomes (Aydin, 2019; Mavilidi et al., 2020). More so, exam anxiety is a significant factor in students' procrastination and weakened learning motivation (Krispenz et al., 2019). Also, the trend is linked to anxiety disorder (Kwon et al., 2020) and high drop-out rates (Vanstone & Hicks, 2019). Exam anxiety encompasses the phenomenological, physiological, and behavioral responses to assessment conditions and adverse outcomes (Donati et al., 2020). There are assumptions that exam anxiety increases at the pronouncement of the exam (Lotz & Sparfeldt, 2017). The trend is prevalent and unfavorable to education (Roos et al., 2020) and is experienced by a substantial number of students across all disciplines (Danthony et al., 2020). Exam anxiety affects students' ability to communicate knowledge during tests (Shadach et al., 2017). Exam anxiety leads to cognitive symptoms like racing thoughts, fear, going blank, and difficulty in bringing out the memorized contents (Manish & Pavithra, 2019).

Research in recent decades has demonstrated an association between exam anxiety and student's academic performance (Balogun et al., 2017; Chapell et al., 2005; Hyseni Duraku & Hoxha, 2018; Morosanova et al., 2020), mental health (Dai et al., 2020; Ng & Lee, 2016; Schaefer et al., 2007), and subjective well-being (Steinmayr et al., 2018). Thus, indicating that the phenomenon is a critical factor in the educational environment. Therefore, the study examines the correlation between the CBA and exam anxiety.

Hypothesis:

There would be a positive correlation between CBA and exam anxiety

Method:-

A total of one hundred and fourteen (n=114) first-year students drawn from public and private tertiary institutions in the Anambra States of Nigeria comprising males and females participated in the study. The students were generally pooled from the selected institution's environment and included 100 level students from different faculties who took their first exam using their CBT assessment method.

Measure:-

Exam anxiety was measured using a modified version of the 22-item Cognitive Test Anxiety Scale developed by Cassady and Johnson (2002). It was revised and validated in Nigeria by Balogun and Olanrewaju (2016). Items in the scale were modified to suit the current study samples. The scale contains 15 items scored on a four-point Likert-type scale ranging from (1 = Not at all typical of me; 4 = Very typical of me). Some of the items in the scale included: "I lose sleep over worrying about the computer-based test, "During the computer-based test, I find myself thinking of

the consequences of failing, "At the beginning of a computer-based test, I am so nervous that I often cannot think straight." The study adopted the procedure outline in Balogun and Olanrewaju (2016).

Result:-

Table 1:-

A correlational research design was employed for the study. The data collected from the respondents were analyzed using the statistical package for social sciences (SPSS version 23). A Pearson's product-moment correlation was performed to determine the correlation between the CBA and exam anxiety. One hundred and fourteen participants were recruited. Analyses revealed that the relationship is linear, both variables were normally distributed as calculated by Shapiro-Wilk's test ($p > .05$), and there were no outliers. There was a statistically significant, moderate positive correlation between CBA and exam anxiety, $r(112) = .32$, $p < .001$, with CBA explaining 31% of the variation in exam anxiety.

Table 1:- Table showing correlation between the main variables.

Variables	M	SD	1	2
1. CBA	3.29	0.34	.12**	
2. Exam anxiety	4.71	0.42	-.33	.32**
R ²	.31			

Note. N = 114, ** = $p < .01$ (two-tailed).

Discussion:-

The current study was aimed to examine the correlation between CBA and exam anxiety. One hundred and fourteen undergraduates completed the survey instrument, and the Pearson's product-moment correlation analyses indicated a statistically significant, moderate positive correlation between computer-based assessment and exam anxiety, $r(112) = .32$, $p < .001$, with the CBA accounting for about 31% of the variation in exam anxiety. Thus, the result supports the assumption that there would be a positive relationship between CBA and exam anxiety. The result provides evidence that the trend in computer-based assessments positively contributes to the increasing exam anxiety among students. Consistent with previous studies (Balogun & Olanrewaju, 2016; Nwagwu & Adebayo, 2016), the finding showed that the students in educational institutions in the Nigerian context might feel anxious relative to the CBA system. This outcome could be attributed to the student's poor exposure to academic-related technological innovations and the belief that the system cannot be manipulated, leading most of them to perceive CBA as a non-manipulative framework. Accordingly, Mavilidi et al. (2020) attributed the phenomenon to anxiety-related thoughts occupying working memory resources during the exam that cannot be used for exam-related processes. Despite passing through a series of computer-based tests before admission, such as the UTME and Post UTME tests, respectively, the majority of the students enrolled in higher education still perceive CBA as foreign to the education system. Hence, the increase in CBA-related exam anxieties. The finding indicates the prevalent of the phenomenon in our tertiary institutions and calls for urgent interventions to curb the trend and increase test awareness. The study suggests that school management should broaden the students' perception to accommodate CBA as part of the learning assessment.

Conclusion:-

The study provided insight into the growing effect of computer-based tests on students' exam anxiety. It is concluded that CBA triggers exam anxiety. Thus, the research finding contributes to exam anxiety literature by showing CBA as a contemporary medium of assessment in the educational system of Nigeria that could trigger a psychological state of anxiousness among students. Although, the study is challenged with certain limitations. For instance, caution is advised in generalizing the result due to the sampling method applied. Because the data collection was based on self-report, the issue of common variance becomes a concern. A more comprehensive sampling approach and multiple data collection methods are required in future research. Nevertheless, the study recommends that school managements adopt simulation test exercises to prepare the students for exams and provide a robust enlightenment intervention. More so, Future studies are needed to examine other intervening variables that explain the relationship between the CBA system and exam anxiety.

References:-

1. Al-Amri, S., & Ali, Z. (2016). A systematic review of computer-based assessments in medical education. *Saudi Journal of Medicine and Medical Sciences*, 4(2). <https://doi.org/10.4103/1658-631x.178288>
2. Aojula, H., Barber, J., Cullen, R., & Andrews, J. (2006). Computer-based, online summative assessment in

- undergraduate pharmacy teaching: The Manchester experience. *Pharmacy Education*, 6(4). <https://doi.org/10.1080/15602210600886209>
3. Aydin, U. (2019). Test anxiety: Gender differences in elementary school students. *European Journal of Educational Research*, 8(1). <https://doi.org/10.12973/eu-jer.8.1.21>
 4. Balogun, A. G., Balogun, S. K., & Onyencho, C. V. (2017). Test Anxiety and Academic Performance among Undergraduates: The moderating role of achievement motivation. *Spanish Journal of Psychology*, 20. <https://doi.org/10.1017/sjp.2017.5>
 5. Balogun, A. G., & Olanrewaju, A. S. (2016). Role of computer self-efficacy and gender in computer-based test anxiety among undergraduates in Nigeria. *Psychological Thought*, 9(1). <https://doi.org/10.5964/psyct.v9i1.160>
 6. Buabeng-Andoh, C. (2019). Factors that influence teachers' pedagogical use of ICT in secondary schools: A case of Ghana. *Contemporary Educational Technology*, 10(3). <https://doi.org/10.30935/cet.590099>
 7. Cassady, J. C., & Johnson, R. E. (2002). Cognitive test anxiety and academic performance. *Contemporary Educational Psychology*, 27(2). <https://doi.org/10.1006/ceps.2001.1094>
 8. Chapell, M. S., Benjamin Blanding, Z., Takahashi, M., Silverstein, M. E., Newman, B., Gubi, A., & McCann, N. (2005). Test anxiety and academic performance in undergraduate and graduate students. *Journal of Educational Psychology*, 97(2). <https://doi.org/10.1037/0022-0663.97.2.268>
 9. Dai, H., Zhang, S. X., Looi, K. H., Su, R., & Li, J. (2020). Perception of health conditions and test availability as predictors of adults' mental health during the covid-19 pandemic: A survey study of adults in Malaysia. *International Journal of Environmental Research and Public Health*, 17(15). <https://doi.org/10.3390/ijerph17155498>
 10. Danthony, S., Mascaret, N., & Cury, F. (2020). Test anxiety in physical education: The predictive role of gender, age, and implicit theories of athletic ability. *European Physical Education Review*, 26(1). <https://doi.org/10.1177/1356336X19839408>
 11. Demara, R. F., Tian, T., Salehi, S., Khoshavi, N., & Pyle, S. D. (2019). Scalable delivery and remediation of engineering assessments using computer-based assessment. 2019 9th IEEE Integrated STEM Education Conference, ISEC 2019. <https://doi.org/10.1109/ISECon.2019.8882114>
 12. Donati, M. A., Izzo, V. A., Scabia, A., Boncompagni, J., & Primi, C. (2020). Measuring test anxiety with an invariant measure across genders: the case of the German test anxiety inventory. *Psychological Reports*, 123(4). <https://doi.org/10.1177/0033294119843224>
 13. Faniran, V. T., & Ajayi, N. A. (2018). Understanding students' perceptions and challenges of Computer-Based Assessments: a case of UKZN. *Africa Education Review*, 15(1). <https://doi.org/10.1080/18146627.2017.1292112>
 14. Fuentes, J. M., Garcia, A. I., Ramirez-Gomez, A., & Ayuga, F. (2014). Computer-Based Tools for the Assessment of Learning Processes in Higher Education: A Comparative Analysis. *Inted2014: 8Th International Technology, Education and Development Conference*, March.
 15. Geraili-Afra, Z., Abadi, A., Yazdani-Charati, J., Goozaji, S. A., Zarghami, M., & Saadat, S. (2018). The effect of computer-based tests on nursing students' test anxiety: A quasi-experimental study. *Acta Informatica Medica*, 26(2). <https://doi.org/10.5455/aim.2018.26.115-118>
 16. Hassanien, M. A., Al-Hayani, A., Abu-Kamer, R., & Almazrooa, A. (2013). A six-step approach for developing computer-based assessment in medical education. *Medical Teacher*, 35(SUPPL. 1). <https://doi.org/10.3109/0142159X.2013.765542>
 17. Hyseni Duraku, Z., & Hoxha, L. (2018). Self-esteem, study skills, self-concept, social support, psychological distress, and coping mechanisms affect test anxiety and academic performance. *Health Psychology Open*, 5(2). <https://doi.org/10.1177/2055102918799963>
 18. Jawaid, M., Moosa, F. A., Jaleel, F., & Ashraf, J. (2014). Computer-based assessment (CBA): Residents' perception at Dow University of Health Sciences. *Pakistan Journal of Medical Sciences*, 30(4). <https://doi.org/10.12669/pjms.304.5444>
 19. Kalogeropoulos, N., Tzigounakis, I., Pavlatou, E. A., & Boudouvis, A. G. (2013). Computer-based assessment of student performance in programming courses. *Computer Applications in Engineering Education*, 21(4). <https://doi.org/10.1002/cae.20512>
 20. Kim, J. Y. (2015). A study of perceptual typologies on computer-based assessment (CBA): Instructor and student perspectives. *Educational Technology and Society*, 18(2).
 21. Krispenz, A., Gort, C., Schülke, L., & Dickhäuser, O. (2019). How to reduce test anxiety and academic procrastination through inquiry of cognitive appraisals: A pilot study investigating the role of academic self-efficacy. *Frontiers in Psychology*, 10(AUG). <https://doi.org/10.3389/fpsyg.2019.01917>
 22. Kwon, J. H., Hong, N., Kim, K., Heo, J., Kim, J. J., & Kim, E. (2020). Feasibility of a virtual reality program in managing test anxiety: A pilot study. *Cyberpsychology, Behavior, and Social Networking*, 23(10).

- <https://doi.org/10.1089/cyber.2019.0651>
23. Lin, J. W., & Lai, Y. C. (2019). User acceptance model of computer-based assessment: Moderating effect of self-regulation. *Australasian Journal of Educational Technology*, 35(1). <https://doi.org/10.14742/ajet.4684>
 24. Lotz, C., & Sparfeldt, J. R. (2017). Does test anxiety increase as the exam draws near? – Students' state test anxiety was recorded over the course of one semester. *Personality and Individual Differences*, 104. <https://doi.org/10.1016/j.paid.2016.08.032>
 25. Manisha M, & Pavithra. (2019). Evaluation of exam anxiety among health science students. *International Journal of Research & Review (Www.Ijrrjournal. Com)* Vol, 6.
 26. Maqableh, M., Masa'deh, R. M. T., & Mohammed, A. B. (2015). The acceptance and use of computer-based assessment in higher education. *Journal of Software Engineering and Applications*, 08(10). <https://doi.org/10.4236/jsea.2015.810053>
 27. Mavilidi, M. F., Ouwehand, K., Riley, N., Chandler, P., & Paas, F. (2020). Effects of an acute physical activity break on test anxiety and math test performance. *International Journal of Environmental Research and Public Health*, 17(5). <https://doi.org/10.3390/ijerph17051523>
 28. Morosanova, V., Fomina, T., & Filippova, E. (2020). The relationship between the conscious self-regulation of schoolchildren's learning activity, their test anxiety level, and the final exam results in mathematics. *Behavioral Sciences*, 10(1). <https://doi.org/10.3390/bs10010016>
 29. Ng, E. L., & Lee, K. (2016). Test anxiety and children's working memory task performance: does trait or state anxiety matter more? *Journal of Experimental Psychopathology*, 7(3). <https://doi.org/10.5127/jep.054115>
 30. Nguyen, Q., Rienties, B., Toetenel, L., Ferguson, R., & Whitelock, D. (2017). Examining the designs of computer-based assessment and its impact on student engagement, satisfaction, and pass rates. *Computers in Human Behavior*, 76. <https://doi.org/10.1016/j.chb.2017.03.028>
 31. Nwagwu, W., & Adebayo, O. (2016). Computer anxiety and computer self-efficacy in computer-based tests in selected universities in South-West Nigeria. *African Journal of Library Archives and Information Science*, 26(1).
 32. Okocha, F. F. F. F., Okocha, O. T. T. E., Toluwani, E., Toluwani, S., Owolabi, S., & Owolabi, O. (2017). Student perception and acceptance of computer-based testing: A case study of Landmark University students. In *Journal of Digital Innovations & Contemp Res. In Sc., Eng & Tech (Vol. 5, Issue 1)*.
 33. Roos, A. L., Goetz, T., Voracek, M., Krannich, M., Bieg, M., Jarrell, A., & Pekrun, R. (2020). Test anxiety and physiological arousal: A systematic review and meta-analysis. In *Educational Psychology Review*. <https://doi.org/10.1007/s10648-020-09543-z>
 34. Sangmeister, J. (2017). Commercial competence: Comparing test results of paper-and-pencil versus computer-based assessments. *Empirical Research in Vocational Education and Training*, 9(1). <https://doi.org/10.1186/s40461-017-0047-2>
 35. Sanni, A. A., & Mohammad, M. F. (2015). Computer-Based Testing (CBT): An Assessment of Student Perception of JAMB UTME in Nigeria. *Computing, Information Systems, Development Informatics & Allied Research Journal*, 6(2).
 36. Schaefer, A., Mattheß, H., Pfitzer, G., & Köhle, K. (2007). Mental health and performance of medical students with high- and low-test anxiety. *PPmPPsychotherapies Psychosomatik Medizinische Psychologie*, 57(7). <https://doi.org/10.1055/s-2006-951974>
 37. Shadach, E., Levy-Frank, I., Levy, S., Amitai, T., & Shadach, E. (2017). Preparatory test anxiety: Cognitive, emotionality, and behavior components. *Studia Psychologica*, 59(4). <https://doi.org/10.21909/sp.2017.04.747>
 38. Sirianni, J. M., Ng, Y. J., & Vishwanath, A. (2019). Adopting computer-based assessments: The role of perceived value in classroom technology Acceptance. *Online Journal of Communication and Media Technologies*, 7(4). <https://doi.org/10.29333/ojcm/2607>
 39. Steinmayr, R., Heyder, A., Naumburg, C., Michels, J., & Wirthwein, L. (2018). School-related and individual predictors of subjective well-being and academic achievement. *Frontiers in Psychology*, 9(DEC). <https://doi.org/10.3389/fpsyg.2018.02631>
 40. Sulistyaningsih, E. (2016). Students' Anxiety Facing Computer Based Test (CBT) System of National Examination. *Proceeding of 3rd International Conference on Research, Implementation, and Education of Mathematics and Science*, May.
 41. Vanstone, D. M., & Hicks, R. E. (2019). Transitioning to university: Coping styles as mediators between adaptive-maladaptive perfectionism and test anxiety. *Personality and Individual Differences*, 141. <https://doi.org/10.1016/j.paid.2018.12.026>
 42. Waddell, K. A., McChlery, S., & Asekomeh, A. O. (2012). The impact on student performance of altering the assessment criteria around formative computer-based assessments. *Research in Post-Compulsory Education*, 17(2). <https://doi.org/10.1080/13596748.2012.673902>

43. Yao, D. (2019). A Comparative Study of Test Takers' Performance on Computer-Based Test and Paper-Based Test Across Different CEFR Levels. *English Language Teaching*, 13(1). <https://doi.org/10.5539/elt.v13n1p124>
44. Zhang, X., & Qin, J. (2020). Empirical analysis of the alleviation effect of music on test anxiety of college students. *Revista Argentina de Clinica Psicologica*, 29(1). <https://doi.org/10.24205/03276716.2020.45>.