Psychosocial Factors Influencing Student's Attitude Towards Computer Based Test

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Abstract
In recent times, the educational landscape of Nigeria has witnessed an increasing adoption of the computer-based test (CBT) for students' assessment, especially in tertiary institutions. Perhaps, the phenomenon has been utilized for various purposes in the world of work. However, insinuations suggest a disparity in student's attitudes towards the adoption of the system for exam purposes. Thus, the present research aims to examine computer anxiety and self-esteem as socio-psychological constructs contributing to the variation in students' attitudes towards CBT in tertiary institutions. Two hypotheses were formulated to guide the study. A convenience sample of one hundred and ninety-five undergraduates pooled from various faculties in three public tertiary institutions in the Kogi state participated in the study. The respondents completed a self-report measure of attitude towards CBT, a computer anxiety scale, and the Rosenberg self-esteem scale. The result revealed that computer anxiety positively predicted the respondent's attitude towards CBT. However, self-esteem negatively correlated with the student's attitudes towards CBT. The study concludes that computer anxiety positively determines students' attitudes towards adopting CBT for assessment purposes.

Introduction:
Information and communication technologies have been engrossed in every part of human activities (Kondra, 2020; Sharma, 2011). Perhaps, the world is increasingly evolving into digital media. The advancement in digital learning has transformed the higher education systems to meet quality education demands in recent years. Possibly, there are boundless opportunities with the integration of ICT in the education system. For example, it ensures greater access, quality, and equity in higher educational institutions (Mir, 2019). Also, the trend has resulted in remarkable growth in the sector. ICT has reformed the practices and procedures of nearly all forms of endeavor within the academic environment (Das, 2019; Marqués, 2014), including record keeping and management of resources (Ghavifekr et al., 2013). ICT tools are extensively immersed in education (Duma & Monda, 2013; McFarlane & Sakellariou, 2002),and it is affecting every aspect of the system from teaching-learning to assessment and evaluation. Accordingly, (Adegbija & Daramola, 2012) contend that technology in education has ensured reliability, efficiency, and universality due to its role in e-assessment.

The global digital trend is increasingly noticed in higher education in developing countries, including Nigeria. Apart from its role in distance learning, technological innovation is gaining ground in the examination systems of Nigerian education. Although the conventional examination methods are widely accepted in the educational systems,
considerable efforts are geared towards adopting a novel digital-based evaluation system (Geraili-Afra et al., 2018). Although using a computer to test knowledge has been used in developed countries in the past decades (Daramola, 2018). The gradual acceptance of CBT is considered an ideal development for assessing students and prospective job seekers (Oluwatosin & Samson, 2013). It has a significant impact on the educational history of the country. CBT ensures fairness and effectiveness in the evaluation process (Sanna et al., 2012) and has several important advantages compared to paper-based exams, such as efficiency, immediate scoring, and feedback, especially in multiple-choice question exams (Boevé et al., 2015). The system provides an improved means for protecting examination questions against unauthorized access (Sarjiyus, 2019).

Computer-based examination with flexibility, efficiency, and speed is gradually becoming an acceptable standard of administering exams across institutions in Nigeria. However, observation suggests that the CBT assessment approach is not an entirely fair method to most undergraduates. Thus, prompting elevated anxiousness (Balogun & Olanrewaju, 2016; Nwagwu & Adebayo, 2016; Olufemi, 2014). Nevertheless, CBT's purpose is not to assess the student's computer literacy or familiarity but to assess the student's knowledge and competence in a course.

Scholars have evaluated the prospect and challenges associated with the adoption of the CBT model in the education of Nigeria (Abubakar & Adebayo, 2014; Awofala, 2020; Chibuzo & Isiaka, 2020; Durojaye et al., 2015; Nwagwu & Adebayo, 2016; Obowu-Adutchay et al., 2019; Olawuyi, 2018; Olufemi, 2014; Rabiu et al., 2020; Sanni & Mohammad, 2015; Tella & Bashorun, 2012). The studies revealed varying results but showed that CBT is preferred to the conventional paper-pencil. The CBT model has been an acceptable method in public and privately-owned educational institutions in Nigeria for students assessments (Olufemi, 2014). CBT streamlines the examination systems, including generation, execution, evaluation, presentation, and archiving of results. This simplification saves time and money while improving reliability. Thus, it is crucial to understand the students' attitudes and influencing factors (Deutsch et al., 2012). Therefore, the present study aims to examine the psychosocial correlates of student's attitudes towards CBT.

Attitudes denote a critical socio-psychological construct that reflects an individual's positive or negative evaluation of any aspect of their socio-world, including objects and situations. Perhaps, attitudes are learned predispositions with the potentiality of influencing human behavior in favorable or unfavorable conditions. Intimation suggests that students' attitudes are an essential determinant of their response to the academic phenomenon and affect their overall performance. Bahar and Asil (2018) have emphasized the need for increased focus on attitudes towards computer-based and online education.

Numerous studies have examined the correlates of student's attitudes towards CBT. For example, Tella and Bashorun (2012) explored students' attitudes towards computer-based tests at the University of Ilorin, Nigeria using 2209 undergraduates from different faculties. The study established a favorable attitude towards CBT by the participants. It also revealed that students are more comfortable with the system than the traditional pattern. However, Yurdabakan and Uzunkavak (2012) investigated the attitudes of primary school students towards computer-based testing and assessment in terms of different variables using primary school. The results indicated that school type significantly influenced the student's attitude towards CBT.

Similarly, Dammam (2016) examined the students' attitude towards computer-based tests at the KAU - Saudi Arabia Jeddah using a sample of sixty undergraduates who had previously taken exams by CBT. The result revealed that prior experience influenced the student's attitude on the use of CBT. In their study, Bahar and Asil (2018) found that university students who used computers for a more extended period had significantly higher scores on attitude towards e-assessment than those who used computers less. In addition, Ali (2012) assessed the factors influencing nursing students' satisfaction with the e-learning experience in King Khalid University utilizing a convenience sample of 135 female nursing students. The result indicated that computer anxiety, e-learning course flexibility, technology quality, perceived usefulness, ease of use, diversity in assessment, and learner perceived interaction with others were the critical factors affecting learners’ attitude towards e-assessment.

The present study focuses on computer anxiety and self-esteem as psychosocial variables explaining the variation in students' attitudes towards CBT. Computer anxiety entails the state of fear or tension of close contact with a computer that might be inconsistent with the actual danger presented to computer users. The condition has been linked with decreased use and avoidance of computer-related tasks and student engagement (Lee & Xiong, 2021). In addition, research has noted that computer anxiety is correlated with attitudes towards computers (Korobili et al.,
2010). Also, Rahardjo et al. (2013) had established a link between computer anxiety and academic stress and procrastination. The phenomenon has been identified as a significant problem for many students, especially freshmen (Oyadeyi, 2018).

Self-esteem refers to the favorable or unfavorable perception of the self. Thus, it reflects the totality of people's evaluation of their worth. Perhaps, research has emphasized the wide gap between people that scored high in self-esteem and those with low self-esteem concerning behavior (Baumeister et al., 2003). More so, evidence abounds that suggests that self-esteem is a significant predictor of attitudes (Ahmed, 2016; Osmanaga, 2017). Attitude is a multidimensional construct that is influenced by several biological and environmental variables. However, the link between self-esteem and attitude towards e-assessment has not received much research attention. The primary purpose of the present study is to answer the question: would computer anxiety and self-esteem influence student's attitudes towards CBT. Thus, it is hypothesized that;
1. Computer anxiety would significantly predict student's attitudes towards CBT
2. Self-esteem would significantly predict student's attitudes towards CBT.

Method:-
In this study, a cross-sectional survey was adopted. Students enrolled in the tertiary education system in the Kogi State of Nigeria constituted the study's population. A convenience sample of two hundred and thirty-three undergraduates comprising males and females primarily pooled from three public institutions in the study parameter participated in the study. They were approached between July and September 2021. The students were prepared and briefed on the research purpose before the commencement of the study. Out of the 233 students approached, 211 consented to partake in the study and were given the study instrument to fill on the spot. Apart from 16 wrongly filled questionnaires, the correctly filled ones (195) were subjected to statistical analysis.

Measure:-
Attitude towards CBT
Attitude towards computer-based tests was measured using a self-developed instrument designed to measure undergraduates' attitudes towards the computer-based examination. The 10-item scale is answered in a 5-point Likert-type questionnaire. The scale's reliability was ascertained after a pilot study was done with the scale, and a Cronbach alpha r=.092 coefficient was recorded on the scale.

Computer anxiety
Computer anxiety was assessed with a modified version of the Computer Anxiety Scale (CAS) initially developed by Agaoglu et al. (2008). The scale assesses student's anxiety and fears when confronted with the possibility of using computers or directly using computers. The originally 28 items scale was modified to 15 items to fit the present context. The instrument is a 4-point Likert-type ranging from "never", "sometimes", "frequently", and "always". Higher scores on the scale reflect a higher level of computer anxiety. The scale recorded a Cronbach alpha .76 in the study.

Self-esteem
Self-esteem was measured using the Rosenberg Self-Esteem Scale (SES)(Rosenberg, 1965). The scale consisted of 10 items measuring respondent's self-esteem. The items were designed and scored in a four-point response scale ranging from Strongly Agree = 1, Agree = 2, Disagree = 3, and Strongly Disagree =4. It also has direct scoring patterns (for items like 1, 3, 4, 7, and 10); and reversed scoring designs for the remaining items (2, 5, 6, 8, and 9). The scale was scored by summing up the total scores for the ten items, and the higher the scores, the higher the self-esteem.

Result:-
A multiple regression analysis was conducted to determine the predictive role of computer anxiety and self-esteem on student's attitudes towards CBT. The investigation revealed that computer anxiety is a positive predictor of attitude towards CBT at F (1,193), 60.035, P<.000. Thus, the first hypothesis that computer anxiety would significantly predict attitude towards CBT was confirmed. Conversely, the assumption that self-esteem would significantly predict attitude towards CBT was not supported F (2,191), 31.222, P>.212.
Table 1: The table shows the result of the multiple regression analysis conducted to determine computer anxiety and self-esteem on attitude towards CBT.

| B    | LL    | UL    | SEB | β    | t    | Sig  |
|------|-------|-------|-----|------|------|------|
| Constant | 2.35  | 2.09  | 2.61 | .14  | 17.598 | .000 |
| CA    | -.48  | -.59  | -.39 | .07  | -.48 | -7.840 | .000 |
| Self-esteem | -.08  | -.21  | .32  | .07  | -.088 | -1.447 | .212 |

R² = 432

Note. C A= Computer anxiety; B = Unstandardized regression coefficient; CI = Confident Interval; LL = Lower Limit; UL = Upper Limit; SEB = Standardized error of the coefficient; β = Standardized coefficient; R² = Coefficient of determination. *P<.000. **p>212

Discussion:

The present study aimed to investigate the variation in student's attitudes towards computer-based tests in tertiary institutions based on computer anxiety and self-esteem. Data from one hundred and ninety-five respondents were analyzed with a multiple regression model. First, the study hypothesized that computer anxiety would significantly predict attitudes towards CBT. The findings of the study showed that computer anxiety positively predicted attitude towards CBT. Thus, the study's prediction is confirmed, meaning that those who scored high in computer anxiety are more likely to exhibit a negative attitude towards the CBT system. At the same time, those with less computer-related anxiousness are keener to embrace the system. Perhaps, previous research has found a correlation between computer anxiety and student's attitude in another domain (Korobili et al., 2010). Thus, the association entails that computer-related anxieties impact student's evaluation of e-assessment and significantly determine their response to computer use. It is inferred from this result that students with computer anxiety will be skeptical of using a computer to write their exams, leading to varieties of dishonest behaviors and consequent academic failures. Nevertheless, research has linked computer anxieties to academic performance (Chou, 2001; Schlebusch, 2018). Accordingly, Celik and Yesilyurt (2013) contend that students with computer anxiety will typically only briefly use computers while taking excessive caution when doing so. One probable explanation of the computer anxiousness of students could be attributed to the student's background. Thus, those who are not exposed to the trending technological innovations in ICT may perceive anything that has to do with computers as complex and beyond their capabilities. Consequently, these students will exhibit resistance to technology, and this anxiety will reflect in fear of using computers. In addition, Schlebusch (2018) noted that these students might experience poorer performance and debilitating thoughts during actual interaction with the computer.

Furthermore, the second prediction of the study that self-esteem would influence students' attitudes towards CBT was not supported by the multiple regression analysis performed on the data. Thus, it means that a student's self-evaluation has nothing to do with one's cognitive, affective, and behavioral tendencies towards the trending computer assessment system. Self-esteem could either be high or low. Researchers have found an association between self-esteem and academic performance (Arshad et al., 2015; Christy & Mythili, 2020; Perveen et al., 2021). Also, intimations suggest that students with high self-esteem get better grades, feel less stress, and do more things. At the same time, low self-esteem can lead to constant self-criticism and persistent feelings of anxiety. Conversely, the result suggests that neither high nor low self-esteem predicts student's attitudes towards the CBT system. This revelation could be explained in that the modest correlations between self-esteem and attitudes do not indicate that high self-esteem leads to a positive attitude or vice versa.

Conclusion:

The present study concludes that students' computer anxiety is a significant determinant of students' attitudes towards the use of technology in assessment. However, self-esteem was negatively correlated with attitudes towards CBT. It is implied that computer anxiety is an emotional component that could hinder the sustainability of e-assessment in the country's educational landscape. Perhaps, the present study provides valuable data to policies
aimed at CBT sustainability in tertiary institutions in Nigeria. Although, the result is fraught with particular limitations. For instance, the self-report measures pose a challenge to the generalization of the findings. However, the study recommends that institutions adopting CBT employ simulation CBT exercises to make the students conversant with the system before the main examination.

References:-
1. Abubakar, A. S., & Adebayo, F. O. (2014). Using computer-based test method for the conduct of examination in Nigeria: Prospects, challenges, and strategies. Mediterranean Journal of Social Sciences, 5(2). https://doi.org/10.5901/mjss.2014.v5n2p47
2. Adegbija, M. V., Fakomogbon, M. A., & Daramola, F. O. (2012). "The New Technologies and the Conduct Of E-Examinations: A Case Study of National Open University of Nigeria." British Journal of Science, 3(Unknown).
3. Agaoglu, E., Ceyhan, E., Ceyhan, A. A., & Simsek, Y. (2008). The validity and reliability studies of the computer anxiety scale on educational administrators (CAS-EA). Turkish Online Journal of Distance Education, 9(3). https://doi.org/10.17718/tojde.08769
4. Ahmed M. Abdel-Khalek. (2016). Introduction to the Psychology of self-esteem. Introduction to the psychology of self-esteem.
5. Ali, W. G. M. (2012). Factors Affecting Nursing Student's Satisfaction with E-Learning Experience in King Khalid University, Saudi Arabia. International Journal of Learning and Development, 2(2). https://doi.org/10.5296/ijld.v2i2.1666
6. Arshad, M., Muhammad, S., & Mahmood, K. (2015). Self-Esteem & Academic Performance Among University students. Journal of Education and Practice.
7. Awofala, A. O. (2020). Are the Keyboards Weightier than the Biros? The Effect of Computer-Based Testing on Students' Achievement and Anxiety in Mathematics. IJIE (Indonesian Journal of Informatics Education), 4(1). https://doi.org/10.20961/ijie.v4i1.40023
8. Bahar, M., & Asil, M. (2018). Attitude towards e-assessment: influence of gender, computer usage, and level of education. Open Learning, 33(3). https://doi.org/10.1080/02680513.2018.1503529
9. Baumeister, R. F., Campbell, J. D., Krueger, J. I., & Vohs, K. D. (2003). Does High Self-Esteem Cause Better Performance, Interpersonal Success, Happiness, or Healthier Lifestyles? Psychological Science in the Public Interest, 4(1). https://doi.org/10.1111/1529-1006.01431
10. Boevé, A. J., Meijer, R. R., Albers, C. J., Beetsma, Y., & Bosker, R. J. (2015). Introducing computer-based testing in high-stakes exams in higher education: Results of a field experiment. PLoS ONE, 10(12). https://doi.org/10.1371/journal.pone.0143616
11. Celik, V., & Yesilyurt, E. (2013). Attitudes to technology, perceived computer self-efficacy, and computer anxiety as predictors of computer-supported education. Computers and Education, 60(1). https://doi.org/10.1016/j.compedu.2012.06.008
12. Chibuzo, O. B., & Isiaka, D. O. (2020). Design and Implementation of Secure Browser for Computer-Based Tests. International Journal of Innovative Science and Research Technology, 5(8). https://doi.org/10.38124/ijisr20aug526
13. Chou, H. W. (2001). Effects of training method and computer anxiety on learning performance and self-efficacy. Computers in Human Behavior, 17(1). https://doi.org/10.1016/S0747-5632(00)00035-2
14. Christy, X. I., & Mythili, T. (2020). Self-esteem, self-efficacy and academic performance among adolescents for Child and Adolescent Mental Health, 16(2).
15. Dammas, A. H. (2016). Investigate Students' Attitudes toward Computer Based Test (CBT) at Chemistry Course. Archives of Business Research, 4(6).
16. Daramola, F. O. (2018). Impact of computer-based test in Nigeria tertiary institutions: A theoretical view. International Journal for Innovative Technology Integration in Education, 109(116), 109–116.
17. Das, K. (2019). The Role and Impact of ICT in Improving the Quality of Education: An Overview. International Journal of Innovative Studies in Sociology and Humanities (IJISSH), 4(6).
18. Deutsch, T., Herrmann, K., Frese, T., & Sandholzer, H. (2012). Implementing computer-based assessment - A web-based mock examination changes attitudes. Computers and Education, 58(4). https://doi.org/10.1016/j.compedu.2011.11.013
19. Duma, L., & Monda, E. (2013). Impact of ICT-based education on the information society. Journal of Futures Studies, 18(1).
20. Durojaye, S. D., Okon, E. O., & Samson, D. D. (2015). Software Quality and Usability for Computer-Based Test in Tertiary Institution in Nigeria: A Case Study of Kogi State University. American Journal of Educational Research, 3(10).
20. Geraili-Afra, Z., Abadi, A., Yazdani-Charati, J., Gooraji, 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
21. Ghavifekr, S., Afshari, M., & Seger, S. S. & K. (2013). ICT Application for Administration and Management: A Conceptual Review. Procedia - Social and Behavioral Sciences, 103. https://doi.org/10.1016/j.sbspro.2013.10.705
22. Kondra, I. S. (2020). The use of ICT in higher education. UGC Care Journal, 40(31).
23. Korobili, S., Togia, A., & Malliari, A. (2010). Computer anxiety and attitudes among undergraduate students in Greece. Computers in Human Behavior, 26(3). https://doi.org/10.1016/j.chb.2009.11.011
24. Lee, J. C., & Xiong, L. N. (2021). Investigation of the relationships among educational application (APP) quality, computer anxiety, and student engagement. Online Information Review. https://doi.org/10.1108/OIR-08-2020-0348
25. Marquês, P. (2014). Impact of ICT on Education: Functions and Limitations. International Journal of Information Communication Technologies and Human Development, 5(4).
26. McFarlane, A., & Sakellariou, S. (2002). The role of ICT in science education. Cambridge Journal of Education, 32(2). https://doi.org/10.1080/03057640220147568
27. Mir, S. A. (2019). ICT integrated higher education: prospects and challenges. International Journal of Research in Economics and Social Sciences (IJRESS), 8(2).
28. 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).
29. Obowu-Adutschay, D. V., Ukwuje, P. R. P. I., & C. I., D. U. (2019). Current Trends in Assessment and Research in Global Education: The Computer Based Test of Joint Admission and Matriculation Board: Retain or Discard in Nigeria. World Journal of Education and Humanities, 1(1). https://doi.org/10.22158/wjeh.v1n1p39
30. Olawuyi, O. F. (2018). Students’ Suitability of Computer Based Test (CBT) Mode for Undergraduate Courses in Nigerian Universities: A Case Study of University of Ilorin. International Journal of Educational Sciences, 20(1–3). https://doi.org/10.31901/24566322.2018/20.1-3.03
31. Olufemi, O. (2014). Computer Anxiety and Computer Knowledge as Determinants of Candidates' Performance in Computer-Based Test in Nigeria. British Journal of Education, Society & Behavioral Science, 4(4). https://doi.org/10.9734/bjesbs/2014/6632
32. Oluwatoso, O. T., & Samson, D. D. (2013). Computer-Based Test: Security and Result Integrity. International Journal of Computer and Information Technology, 02(02).
33. Osmanaga, P. A. D. F. (2017). The Impact of Self-Esteem on the Attitudes Towards Homosexuality. European Journal of Interdisciplinary Studies, 8(1). https://doi.org/10.26417/ejis.v8i1.p171-176
34. Oyadeyi, J. B. (2018). An Assessment of Computer Anxiety among Distance Learning Freshmen in South-Western Nigeria. KIU Journal of Social Sciences, 4(2).
35. Perveen, S., Ikram, H., & Nisa, Q. U. (2021). Relationship among life satisfaction, self-esteem, and academic performance of university students in Pakistan. Humanities & Social Sciences Reviews, 9(3). https://doi.org/10.18510/hssr.2021.9341
36. Rabiu, N., Kehinde, A., Amuda, H. O., & Kadiri, K. K. (2020). University of Ilorin Undergraduate Students' Perceptions of the Usefulness and Challenges regarding Computer-Based Testing. Mousaion: South African Journal of Information Studies, 37(4). https://doi.org/10.25159/2663-659x/7305
37. Rahardjo, W., Juneman, J., & Setiani, Y. (2013). Computer Anxiety, Academic Stress, and Academic Procrastination on College Students. Journal of Education and Learning (EduLearn), 7(3). https://doi.org/10.11591/edulearn.v7i3.179
38. Rosenberg, M. (1965). Rosenberg: society and the adolescent self-image. Social Forces.
39. Sanna, A., Lamberti, F., Paravati, G., & Demartini, C. (2012). Automatic assessment of 3D modeling exams. IEEE Transactions on Learning Technologies, 5(1). https://doi.org/10.1109/TLT.2011.4
40. 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).
41. Sarjipius, O. (2019). Securing Computer-Based Testing (CBT) System for Tertiary Institutions in Nigeria. Asian Journal of Research in Computer Science. https://doi.org/10.9734/ajrcos/2019/v3i330094
42. Schlebusch, C. L. (2018). Computer Anxiety, Computer Self-efficacy, and Attitudes towards the Internet of First-Year Students at a South African University of Technology. Africa Education Review, 15(3). https://doi.org/10.1080/18146627.2017.1341291
43. Sharma, K. (2011). The Role of ICT in Higher Education for the 21st Century: ICT as A Change Agent for Education. VSRD International Journal of Computer Science & Information Technology, 1(6).
44. Tella, A., & Bashorun, M. T. (2012). The attitude of undergraduate students towards computer-based test (CBT): A case study of the University of Ilorin, Nigeria. International Journal of Information and Communication Technology Education, 8(2). https://doi.org/10.4018/jicte.2012040103
45. Yurdabakan, I., & Uzunkavak, C. (2012). Primary school students' attitudes towards computer-based testing and assessment in Turkey. Turkish Online Journal of Distance Education, 13(3). https://doi.org/10.17718/tojde.91607.