IMPACT OF COMPUTER SKILLS ON CREATIVITY AMONG SECONDARY SCHOOL STUDENTS IN KATSINA METROPOLIS, KATSINA STATE

BY

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Abstract
The study investigated the impact of computer skills on creativity among secondary school students in Katsina metropolis, Katsina state. An ex post-facto research design was adopted. The population of four thousand eight hundred and three (4,803) students was obtained, the sample size of this study comprised of total number of three hundred and fifty-four (354) senior secondary students (SSS III) at a confidence level of 95% and a Margin Error of 5.0% from four (4) schools using purposive sampling techniques. The instrument used consists of three sections: section "A" contained personal data of respondents; section "B" Computer Skill Questionnaire (CSQ) self-developed questionnaire and adopted version of Nicolas Holt Creativity Test (NHCT) tagged Creative Cognition Questionnaire (CCQ), with reliability coefficient of 0.82 and 0.71, for CSQ and CCQ respectively. Three research hypotheses were generated and tested using multiple regression analysis and t-test at 0.05 level of significance. The result analysis of showed that, the predictor variable (computer skills and gender) to the prediction of creativity with R=.084, which is equivalent to 84%. This indicates a good level of prediction. R^2 =.007 which is equivalent to 7%, indicating the level of shared variance between the variables ($F_{c=354}$, 1.233 ;< 0.05). Gender difference on computer skills and creativity shows (t= 0.200, t= 0.514, p<0.05) respectively. In conclusion, based on these findings, it was recommended that Counsellor, teachers need to be trained to know and adopt methods which foster complementary values by fostering creativity-friendly school environment. School authorities should manage the students and teachers in a way that encourages the culture of creativity values in modern uses of ICT gadgets.
Keywords: *Computer skills, Creativity, Information Communication and Technology (ICT), Secondary School Students*

Introduction
There is no doubt that computer and information technology is the trend of the day. This is evident as we see the world shift the paradigm from analog to digital. As the information technology becomes more widespread, the importance of computer and technology use increases and turns out to be an important element in human resources (Ono & Zavodny, 2004). It has been observed that educators have begun to use computer assisted teaching methods often to increase the student participation to the classroom activities and to promote access to learning materials. This is in line with the development in the Nigeria Education sector, as the Federal Government of Nigeria in the National policy on Education (FGN, 2013) has incorporated computer training into Nigeria Education in order to produce rare students which are capable of thriving in the demand of the 21st century through critical thinking and creativity in Education. To facilitate this objective, the policy article states that the government will provide basic infrastructure and training at the primary schools. Therefore, computer training has been made a pre- vocational and vocational elective at the junior secondary schools and senior secondary schools respectively**.**

The growth of computing and its related activities is at an exponential rate. Incorporating ICTs has become a very important priority in the education sector. It contribute to universal access to education, equality in instruction, quality in teaching and learning and the professional development of teachers, as well as to more efficient management and educational administration system. Thus, they are essential to achieving more egalitarian societies (UNESCO, 2014). A computer skill in a simple language is the capacity to make use of computer. Ferreira (2013) stated that computer science is one of the most active fields where new knowledge,

new technologies and theories continually to emerge. The field of computer is a pedestal where people with creative thinking showcase their endowments.

The term *"computer literacy"* is often used as a basis of making decisions regarding a student's ability to perform specific tasks on a personal computer (Lahore, 2008). According to Nash (2009), the definition of computer literacy have changed over time, with the focus shifting from the ability to write computer programs to the ability to use computer applications. In Kuburat and Adams (2018), Computer skill is the level of expertise and familiarity someone has with computer generally and the ability to use computer applications rather than the program. It was also defined there, that, computer skill is the ease of use and ability to operate a computer as a problem solving tool. According to Li (2008), Computer literacy consists of the experience and abilities to operate computer, including knowing the structure of computer software and hardware, having the skills to operate computer software and applying computer usage to social issues.

Nigerians regards computer literacy as an imperative educational objective so much that computer technology has being incorporated into the curriculum. One of such is the computerization project launched in Lagos state. Adebowale, Adewale and Oyeniran, (2010) reports on the launching of a global computerization project in Lagos State government through the Ministry of Science and Technology. The program which involves the networking of Lagos State and the introduction of ICT into her various secondary schools with provision of microcomputers distributed across some selected secondary schools. In order to make the project effective, the train-the- trainer was also implemented.

The impact of computer has led to several modifications in all the systems (educational, social, political and health). These changes are seen in the way people are becoming more technological. In fact, during the lock down almost everything practically became electronic, e-commerce, e-recreation (where both families and friends get to meet interact via the available social media; the instagram, zoom, google meet, whatsapp face-book etc.) e-pharmacy, e-learning were all primed than ever. This is an indicator of the shift in the world system and the earlier the educational sector prepare for this change through adequate equipping of the young minds, the better we are to meet the fast pace and changing world. By implication, in the light of these changes, one can infer that students can get the best out of learning experiences through the use of their computer skill to tap into the myriads of resources available on the internet. According to Aitokhuehi & Ojogbo (2014) model of computer literacy indicates that computer literacy is the bedrock of sound academic performance. The model shows the process of computer literacy. In their findings, they discovered that computer literate students performed better academically than the non- computer literate students.
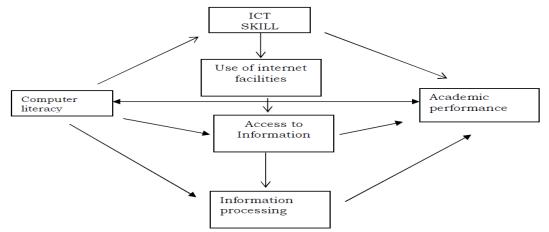

Figure 1.1 Model of Computer Literacy
Sources: Adopted from Aitokhuehi & Ojogbo (2014).

The etymological line of the expression (creativity) take us back to the Latin verb *creare*, which meant bringing something forth making or producing something. Creativity has to do with initiation of either new

ideas or building on the existing one in order to provide solution to problems. So many definitions of creativity have being advanced. Olatoye, Akintunde and Ogunsanya (2010), see creativity as a confluence of intellectual activity, knowledge, motivation, thinking styles personality and environment. It has also being defined from product perspective which proposes two-factor criterion, the originality and the usefulness (Glaveanu & Kaufman 2019). Creativity has been defined in a number of different contexts. Boden (2001) believes that creativity is the ability to come up with new ideas that are surprising yet intelligible, and also valuable in some ways. Similarly, Olatoye et al., (2010) defines Creativity as the ability to make or bring to existence something new, whether a new solution to a problem, a new method or device or a new artistic object or form. Similarly, Lubart (2001) defines creativity as a sequence of thoughts and actions that leads to a novel adaptive production. In this same vein, Houran and Ferrence (2006) see creativity as a mental process which produces novel and useful concepts or ideas or it could be innovative relationships between ideas or concepts. A new belief in the power of human reason and capacity to change the world offered the foundation for a much more individual notion of creativity (Glăveanu, & Kaufman, 2019).

Creative thinking is sequel to creativity. Creative thinking can be nurtured, meaning that it can be acquired. According to Wheeler et al., (2002), creative thinking is one of the most important skills children can acquire and develop while in their formative stage. According to Olatoye et al., (2010), creative thinking has two aspects: divergent thinking (intellectual ability to think so many originals diverse and elaborate) and convergent thinking (to logically evaluate critique and choose the best ideas from a selection of idea). Kampylis and Berki (2014), described creative as the thinking that enables students to apply their imagination to generating ideas, question and hypotheses, experimenting with alternatives and to evaluating their own and their peers' ideas, final products and processes. It is worthy to mention that, when learning and social environment support creative thinking, the students creative traits will be primed. Nwazuoke, Olatoye and Oyundoyin (2002), argued that environment where a child finds himself/herself could foster or inhibit creativity. Although the government has successfully introduced computer studies in the schools, however, it has been observed that students still lack the fundamental computer skills which will enhance their creativity with respect to the millennia development. More so, considering the trend in the country, not many secondary school graduates have the privilege to further their education and a such are not well integrated to the society due to the fact that they lack computer skills which could make them self-reliant. Though a child might have acquired some level of intelligence from the parents which should make him creative, yet governments, education planners and implementers have roles to play to improve and advance their creativity. Dingledine (2003) emphasized that family support, availability of learning materials and social pressures are some of the factors that influence the development of creativity.

In the same way, Mike (2003), findings revealed that ICT facilities serve as a major contributor to effective teaching and learning through which it enhance students' creativity. Mbaeze, Ukwandu and Anugu (2010) posited that there is influence of information and communication technology (ICT) on the academic performance of students and generating insight knowledge of creating ideals. Olatoye et al., (2010) carried out study to investigate the relationship between students' creativity and Cumulative Grade Point Average (CGPA) scores of students in selected polytechnics in Southwest of Nigeria, the study reveal that, there was a very low negative insignificant relationship between creativity and CGPA scores. Thus, the higher the students' creativity, the lower the CGPA score. A creative person may not necessarily be a high achiever in school. Creativity is as a confluence of intellectual activity, knowledge, motivation, thinking styles personality and environment (Olatoye et al., 2010). He went further by saying creativity is the basic tool for progress in any society and community. Although creativity cannot be viewed from a pin-hole dimension, however, there are certain terms associated with creativity. Words like discovery, innovations, inventions, are usually used interchangeably or as synonyms of creativity. This study intends to find out the impact of computer skills on students' creativity in some selected senior secondary schools in Katsina metropolis**.**

Statement of the Problem
Although, so many researchers have been carried out either on the relationship of computer use and academic performance, student computer literacy skills: a comparative analysis, basic computer literacy skills, or on effect of computer base training to increase creativity etc. Little or none has so much delve into computer skill and creativity in Nigeria contest. The Federal Government of Nigeria has through the educational sector

incorporate computer into the curriculum, however, the point of application of computer skills as a tool for heuristic method to bring about student creativity is still the missing link. According to Nash (2009), African students are most at risk of being disadvantaged by their lack of prior skill in computer. According to Ferreira (2013) in his article on creative development where he stated that although creativity is advantageous to any study but the but the perceived lack of creativity and it's expression in computer science students severely hampers their ability to accommodate the skills necessary to successfully perform within the information technology industry. He continued by saying traditional education focus on transmitting knowledge and neglect fostering students creative ability consequently causing their creative ability to be handicap. Similarly, Olatoye (2010) opines that the problem with our educational system is that students are not taught in a way that enhances creative thinking and the assessment procedures do not reward creativity. Dingledine (2003) asserted that family support, availability of learning materials and social pressures are some of the factors that influence the development of creativity. In fact Olatoye et al., (2010) believed that environmental pressures can foster or inhibit creativity. But our school system has not sustained sufficient force to enhance creative thinking. The thrust of study is to investigate the influence of computer skills on students' creativity in some selected secondary school in Katsina metropolis, Katsina State.

Purpose of the Study
The purposes of this study are:
1. To investigate the influence of computer skills on students' creativity among secondary school students in Katsina metropolis.
2. To examine the differences in the computer skills among secondary school students in Katsina metropolis based on gender
3. To find out the differences in the students' creativity among secondary school students in Katsina metropolis based on gender

Research Questions
The following question would be asked in the study:
1. What is the influence of computer skills and gender on students' creativity among secondary school students in Katsina metropolis?
2. What are the differences in the computer skills among secondary school students in Katsina metropolis based on gender?
3. What are the differences in the students' creativity among secondary school students in Katsina metropolis based on gender?

Research Hypotheses
The following hypotheses would be raised to guide the study:
Ho$_1$: There is no significant combined influence of computer skills and gender on students' creativity among secondary school students in Katsina metropolis.
Ho$_2$: There is no significant difference in the computer skills among secondary school students in Katsina metropolis based on gender
Ho$_3$: There is no significant difference in the students' creativity among secondary school students in Katsina metropolis based on gender

Methodology
The study was adopting a descriptive survey research design of survey type. It was combine the use of survey studies and ex-post facto research designs. The designs give researchers opportunity to collect data from respondents for the purpose of analysis, interpretation and generalization of the findings. The population of this study consists of all the public senior secondary schools in Katsina metropolis. Purposive sampling technique was used to select four schools that are equipped with computer facilities by National Communications Commission (NCC) under the umbrella of Universal Service Provision Fund (USPF)/School Access Project (SAP) Abuja (2013) among public senior secondary schools in Katsina metropolis. The target population was made up of S.S.S. III students with total number of eleven thousand seven hundred and fifty-five (11,755), while the total population of four (4) selected sampled schools is four thousand eight hundred and three (4,803) students. The sample was selected because there are in exit class

and had requisites skills about computer literacy. The sample size estimation is in line with the recommendations offered at a confidence level of 95% and a Margin Error of 5.0% (Research Advisor, 2006). A total sample size that was appropriate for the research was three hundred and fifty-four (354) students which were selected as sample for the study, which comprises of one hundred and ninety-five (195) male and one hundred and fifty-nine (159) female students (respondents). The sample size for each school was determined by using percentage (%) with to respect to their population, this was used to obtain required number of respondents in each sampled schools for the study. Simple random sampling techniques was used to select students from each school, the researcher used simple random sampling, because it's requires the proportions of the students (respondents) in the population that would reflect in the sample. However, the simple random sampling technique was employed using a lucky deep method of "Yes and No" to select the respondents from each school, whereas it give every member of the population an equal chance for been selected for the study.

The instrument used for this study is questionnaire which was divided into three sections: Section A: contained personal information of student, Section B: contained Computer Skill Questionnaire (CSQ) which was developed by researcher. It contained 20 items questionnaire used to test students' computer literacy skills among the secondary school students. Scoring was done using modified four-Likert scale 1=No Skill (NS), 2=Little Skilled (LS), 3=Average Skill (AS) and 4=Highly Skill (HS). Section C is Creative Cognition Questionnaire (CCQ) contained adopted version of Nicolas Holt Creativity Test (NHCT), it is twenty-nine (29)-item instrument, developed by Nicolas Holt to test the level of creativity among individual students'. The instrument was used by Olatoye et al., (2010), the reliability co-efficient of 0.88 was obtained. The instruments were structured using Likert type four-point scale method: 4=Strongly Agree (SA) 3=Agree, (A) 2=Disagree (D) and 1= Strongly Disagree (SD). To ascertain the validity of the instrument, face and content validity was done by given questionnaires to experts in the Educational Psychology Section of Department of Educational Foundations for screening and vetting. To establish the reliability of the instrument, test-retest method of reliability was employed. The questionnaire was administered twice at an interval of two weeks to twenty (20) non-participating respondents in a secondary school that is not part of the sample. The two set of scores were correlated using Cronbach alpha reliability coefficient of 0.82 and 0.71 was obtained for Computer Skill Questionnaire (CSQ) and Creative Cognition Questionnaire (CCQ) respectively, which shows that the instrument was reliable for the study. The questionnaire was personally administered by the researcher along with the school computer teacher/computer laboratory attendant to ensuring the instrument is filled accurately by the respondents (students). Data was collected and analyzed by the use of inferential statistics. Hypothesis 1 was analyzed by the using Multiple Regression Analysis while hypotheses 2 and 3 were analyzed using t-test. All the hypotheses were tested at 0.05 alpha level of significance. (SPSS) version 23 was used to analysis data.

Results

Ho$_1$: *There is no significant influence of computer skills and gender on students' creativity among secondary school students in Katsina metropolis.*

Table 1: Regression Analysis Showing Combine of Computer skills and Gender on Students' creativity among Secondary School students in Katsina metropolis.

R = 0.084
R Square = 0.007
Adjusted R Square = 0.001
Standard Error = 13.51730

Analysis of variance

	Sum of Squares	Df.	Mean Square	F	p	Remark
Regression	450.579	2	225.290	1.233	0.293	Sign.
Residual	64133.760	351	182.717			
Total	64584.339	353				

a. Dependent Variable: CREATIVITY
b. Predictors: (Constant), GENDER, COMPUTER SKILL

In Table 1, the result of the statistical significance of the model is presented, the F- ratio in the ANOVA table above tests whether the overall regression model is a good fit for the data. The table shows that the independent variables statistically significantly predicts the dependent variable F = 1.233, p = 0.293. The combined influence of computer skills on students' creativity and gender accounted for 8.4% of the total variance of (R Square = 0.007, p < 0.05).

Ho$_2$: *There is no significant difference in the computer skills among secondary school students in Katsina metropolis based on gender*

Table 2: Comparison of computer skills among secondary school students in Katsina metropolis based on gender

Gender	N	Mean	Std. dev.	Std. error	df	t	Remark	
Male	195	95.031	13.523	0.968				
Female	159	94.736	13.571	0.076	352	0.200	NS	

Table 2, shows that there is significant difference computer skills among secondary school students in Katsina metropolis based on gender (t= 0.200, p<0.05). Thus, hypothesis two is here by rejected. Male students have significant higher skills than their female counterparts.

Ho$_3$: *There is no significant difference in the students' creativity among secondary school students in Katsina metropolis based on gender*

Table 3: Comparison of students' creativity among secondary school students in Katsina metropolis based on gender

Gender	N	Mean	Std. dev.	Std. error	df	t	Remark	
Male	195	51.913	17.491	1.253				
Female	159	50.943	17.802	1.412	352	0.514	NS	

Table 3 shows that there is significant difference students' creativity among secondary school students in Katsina metropolis based on gender (t= 0.514, p<0.05). Thus, hypothesis three is here by rejected. Male students have significant higher mean score than their female counterparts.

Discussion of Findings

The finding of this study revealed that computer skills and gender among secondary school students in Katsina metropolis are significantly predicting students' creativity. This finding shows that there is significant relationship between computer skills, creativity and gender, it is in support of Kuburat and Adams (2018) traced the declined student's achievement to high computer skills and utilization of ICT facilities. In the same vein, Mehmet (2010), buttress that in order to be successful in academics and career, it is essential that students possess improved computer skill which determined students' creativity in ICT programming. There was also significant difference between male and female students on each component of computer skills namely Microsoft word, Microsoft excels, CorelDraw and computer interface etc. Olatoye et al., (2010) the study reveal that, there was a very low negative insignificant relationship between creativity and students' performance.

The finding of hypotheses two revealed that computer skills among secondary school students based on gender is significantly different, this is in support of revealed that Hoffman and Vance (2005) state that he current functional understanding of computer literacy is based on gender and primarily on the ability to use personal computer and internet applications in order to improve learning, productivity and performance of both male and female in schools. Computer is now a tool in the school community, the usage is becoming more and more common as its being channeled to benefit students, in term of learning using internet and other computer interface like Microsoft word for document, Microsoft excels calculation, CorelDraw for drawing and graphical work.

The finding of hypotheses three revealed that students' creativity among secondary school students in Katsina metropolis based on gender is significantly difference, this is in support of Oyundoyin and Olatoye (2007) reported that there was no difference between male and female students on general creativity tests. There is gender difference on creativity as the whole. However, the findings revealed gender differences in subscales scores. According to this result, males scored higher than females in the divergent thinking factor, while males scored higher than females in the convergent thinking. There is also significant difference between male and female students' computer skills. In contrary Olatoye, (2009) show that there is no significant difference between male and female student creativity. Thus males and female students have the same level of creativity and academic achievement. Creativity and academic achievement among students are not sensitive to gender. Creativity has been identified as a key requirement of entrepreneurship which has been adopted nationally, as a major curriculum in developing individual abilities in converting them into novel and useful services in self-dependent for personal and humanity development.

Conclusion
The following conclusions were reached based on the outcome of the study. It's concluded that creativity and gender have combined influence on computer skills of senior secondary school students and have significant relationship between creativity and gender of senior secondary school students. In addition, there is significant difference in the computer skills and gender of senior secondary school students based on gender. This implies that both creativity and gender are strong variables that influence students' computer skills.

Recommendations
Based on the findings, it is recommended that:
1. counsellor, teachers need to be trained to know and adopt methods which foster complementary values by fostering creativity-friendly school environment.
2. school authorities should manage the students and teachers in a way that encourages the culture of creativity values in modern uses of ICT gadgets.
3. neither male nor female should not be discriminated against in tasks that require demonstration knowledge of creativity thinking in computer skills.

References

Adams O.U. & Kuburat O. T. (2018). Students' Computer Skills and Student Achievement in Senior Secondary School in Ogun State, Nigeria. *International Journal of Computer Application Volume 179, No. 24.*

Adebowale O. F, Adewale, L. A & Oyeniran, F. M (2010). Computer interest, approval and confidence of senior secondary school in three selected Local Government of Lagos State (Nigeria). Implication for global computerization international *Journal of Education and Development using Information and Communication Technology 6 (1), 40-52.*

Aitokhuehi, J.O & Ojogho, J (2014). The Impact of Computer Literacy on Students' Academic Performance in Senior Secondary School Esan West Local Government Area, Edo State, Nigeria. *Journal of Education and Human Development. Volume 3, No 3.*

Ausubel, D. P (1963). The Psychology of meaningful verbal learning: An introduction to school learning. Grune and Stratton, New York.

Boden M. (2001). Creativity and Knowledge . In creativity in Education (eds A. Craft, Jeffrey and M. Leibling) pp 95-102 continuum London.

Carol R. A. (2005). Creativity in problem solving: uncovering the origin of new ideas. *International Education Journal,* ERC Special Issue, 5 (5), 43-56.

Dingledine R. (2003). Creativity: Environment and Genetic Factor.
        Glăveanu, V. P., & Kaufman, J. C. (2019). Creativity: A historical perspective. In J.C.

Hoffman, M. E. & Vance, D. R. (2005). Computer Literacy: what students knows and from whom they learned it. ACM SIGCSE Bulletin, 37, 1, 356-360.

Houran J. & Ferrence, G. A (2006). Nurturing Employee Creativity. New York:HVS International.

Jane M. N. (2009). Computer Skills of First- Year Students at a South African University.[Centre for Educational Technology University of Cape Town South Africa.

Kampylis, P. & Berki, E. (2014). *Nurturing creative thinking*. International Academy of Education, UNESCO. Available at: http://unesdoc.unesco.org/images/0022/00227/227680e

Katsina Ministry of Education, MOE (2021). Department of Planning, Research and Statistics (PRS). Ministry of Education. Katsina state, Nigeria.

Kaufman, F. & Sternberg R. J. (Eds.), *Cambridge handbook of creativity (2nd Ed)* (pp. 11-26). New York: Cambridge University Press.

Li, L. Y. (2008). The relationship between computer literacy and online learning attitudes for student in the graduate school of education in Taiwan. *Unpublished Dissertation*, Alliant International University.

Lubart T. (2001). Models of the creative process: past, present and future. Creative Research Journal 13, 295-308.

Martinez-Otero V. (2007). Los adolescents ante el studio. Causas y Consecuencias del,rendimiento academic. Madrid: Fundamentos.

Mbaeze, Ukwandu & Anugu (2010). the influence of information and communication technology on student academic performance. *International journal of research and technology, 2, 48-59.*

Mehmet G. (2010). University Students' Computer Skills: A Comparative Analysis. Gazi University.TOJET- Volume 9 Issue 2.

National Communications Commission (2013). Universal Service Provision Fund (USPF)/School Access Project (SAP). Abuja.

Negus K. & Pickering M. (2004). Creativity and musical experience

Nwazuoke I. A, Olatoye, R. A & Oyundoyin J. O. (2002). Environmental Factor as a Predictor of Creativity among Senior Secondary School Student in Oyo State. *Ife Journal of Behavioural Research, 4 (1), 85-93.*

Olatoye, R. A., Akintunde, S. O. & Ogunsanya, E. A. (2010). Relationship Between Creativity and Academic Achievement of Business Administration Students of South Western Polytechnics, Nigeria. *International Multi-Disciplinary Journal, Ethiopia Vol. 4 P Pp. 134-149.*

Ono, H. & Zavodny, M. (2004). "Gender Differences in Information Technology Usage: A U.S- Japan Comparison". Federal Reserve Bank of Atlanta. Working Paper Series.

Reston, V. A. (2000). Principles and Standards for School Mathematics. National Council of Teachers of Mathematics.

UNESCO (United Nation Educational, Scientific and Cultural Organization) (2014). reading in the mobile Era. A Study of Mobile Reading in Developing countries, Paris.

Weiner, R. P. (2000). Creativity and beyond: Cultures, Values and Change. Abany: State University of New York press.