# MODELLING HIGHER DEGREE STUDENT DIGITAL CITIZENSHIP IN NIGERIA

**Author's name:** Afeez T. Jinadu Ph.D.
*Centre for Educational Research and Management Ibadan, Nigeria*
**E-mail:**afeezjinadu95@gmail.com

| Abstract | *The study investigated the consistency of the structural equation modelling of digital nativity, digital literacy, category of adoption of digital devices, and digital citizenship.Ex-post facto design was adopted. Simple random sampling technique was used to select three states from South West, Nigeria. Twenty postgraduate students were randomly selected from the chosen departments in the federal and state universities, while ten postgraduate students were randomly selected from three departments in the private universities making690 participantsfor the study. Digital Literacy test (Kuder-Richardson$_{20}$ = 0.86) and Digital Construct Response Scale (reliability = 0.84) were the instruments. Data were analysed using path analysis at 0.05 significant levels.Four out of the six hypothesised paths significantly explained the consistency of the causal model. Digital nativity (0.95), category of adoption of digital devices (0.05), digital literacy (0.24), accounted for 99.7% of direct effect on digital citizenship, whereas digital literacy (0.01), accounted for 0.3% indirect effects on digital citizenship. Goodness-of-fit index and other model fits were $\chi^2_{(2)}=1.88$; Absolute-Goodness-of-Fit Index = 0.99; Root-Mean-Square-Error-Approximation = 0.01. There was a positive causal effect among the variables therefore, higher degree students should consider digital nativity with inputs from category of adoption digital technology to become digital citizens.* |
|---|---|
| Keywords | *Digital nativity, literacy, Adoption, digital citizen, and Causal Modelling* |

## INTRODUCTION

As technology continues to change and shift, technology users must adapt with the changes, within this changes, wide range of reactions in terms of behaviors are exhibited which may or may not be inconformity with the acceptable standard behavior of users of technology. The current generation now get extensively involved in connection and networking by involving in media early enough through exploration of menu of the gadgets right from mere looking at the screen of the gadgets.

Higher proportion of children at home held a mobile gadget all about with similar proportion stocking to television set (Rideout& Robb, 2018). Children of age 5 to 8 spend an average of nearly three hours per day using screen media, with one hour of that time on mobile devices (Rideout& Robb, 2018). In spite of dominance of watching television by children, exploring hand held devices for game playing, book reading, videos watching and streaming still permeate their lives. In the same vein, about six hours daily is being spent on multimedia by children in whom the length of hours spent increases with their ages up till adult life in which higher degree students are inclusive. This have greater implication on lifestyle considering length of time spent online, so a look at online behavior called digital citizenship is considered imperative.

Digital citizen is widely described as individual who employ the internet on regularbasis and in effective manner.Digital citizensneed to knowcertain issues associated with technology, and practice legal and standard behaviors. Theyare safety, law, responsibility, employment and practice which must be pushed for in terms of information and technology; collaboration supported technology to adoptpositivesign attitude for learning and productivity foreveron learningabout personal responsibility shown in leadership via citizenship.These behaviors have been reported to be guided by a number of factors. If the behaviors are not guided there is tendency for citizens of digital world to change environment via employment of technologies in unethical, illegal, unsafely, unaccountable and inappropriate mannersGreenhow,

Robelia&Hughes, 2009). Observably, digital nativity, category of adoption of digital devices and digital literacy seemed to be prominent influence on digital citizenship.Digital nativity has to do with the age to which an individual is born to with respect to digital world. Thompson (2015) explore eight digital natives and found out that they generally believe this generation of students depend on technology for both their learning and general life experiences this have implications for the way and manner they interact with technology. Within these experiences, Thompson's study found that multi-tasking and connectivity with their friends through social media was prevalent among digital natives and consistent with the popular view of how digital natives live their lives. Also, digital natives of a high school in south California was examined with respect to experiences on social and academic activities it was found out that teachers observed pattern of behaviors among students which helped to deal with digital natives in the 21st century (Dennis, 2018). Rogers was popular with the adoption category of innovation and put features of the fiveadoption groups: innovator, early adopter, early majority, late majority and laggard. These categoriesare offshoot of watchingreality that is designedto create distinctions(Rogers, 2003; Otunla&Jinadu, 2014).Simplysaid, the innovators and early adopters areentrepreneurial, social, welfare and the well informed, while the late majority and laggardsto be careful, separated, notrich and less in information.Those who stay behind, according to Rogers' arequite similargroup.Heidentifies those left behind as close to cut away suspect of new products and change agents, hasa reassurance of management of wealth point, is less informed,hasalack to knowledge of new thoughts and has primitive values. Although he undersc ore slaggards not to be in one negative manner, their features as drawn by Rogers to be not easy attractive. Each of the categories of adopters have respective way and manner with which they interact with digital technology. Spante, Hashemi, Lundin & Algers (2018) reported misuse of digital compete nce and digital literacy in discussion because users find the differences between these concepts abstract. They defined digital literacy as basic skills in ICT. Often times, that the two concepts have been misused the fact still remain that they are rooted in different sources and hence, different interpretations. The like of European Union framework used them to underlie major components of skills required by all citizen within the digital globe(Iordache, Mariën, &Baelden, 2017; Anderson & Jiang, 2018). Poushter (2016) in his study on smartphone ownership and internet usage detect that highly educated parents are more critical of digital technology without employing in frequency different from averagely educated parents. Although, digital media are taken as crucial sources of information by parents in the work, the highly educated parents seem to have a bigger factual information of the dealing with digital platform. It is mattering how parent's childhood appears to be interconnected with the children's education. Parents carry over habits and experiences of their own childhood days to that of their offspring. Put differently, applied science which they commonly employed in childhood is more consented for regular employment than fresher applied science (Claßen, 2012). Previous studies that have investigated digital nativity, digital literacy and Category of adoption of digital devices have done so using college students and these investigations were subsequently tied down to variables such as achievement, interest and attitude which are outside digital citizenship being considered in this study. However, these variables cannot be limited to only college students and their academic achievement. It is possible to extend them to higher degree students as it was done in this study. Literature reviewed on variables in this study so far also indicated failure to test hypothesized models in a path analytical study comprising digital nativity, digital literacy, Category of adoption of digital devices and digital citizenship. Correlation and/ or multiple regressions were employed to analyzed data collected. These methods of analysis do not reflect the causal nature of such relationships and do not take care of

most measurement errors. This amounts to disregarding errors, which may imply serious faults in the end. Other studies that have used path analysis and supplemented it with other statistical packages also suffer from notbeing able to bring out both basic calculations and graphics simultaneously, but instead, require writing computer programming called syntax, which is able to do that. Therefore,the researcher investigated the extent to which digital nativity, digital literacy, Category of adoption of digital devices and digital citizenship has causal relationship.

## METHODOLOGY

### Research Type, Design and Variables of the Study

The study adopted *ex-post facto* of correlational research type because the variables had occurred much earlier before measurement.

**Exogenous variables:** digital nativity and Category of adoption of digital devices.

**Endogenous variables:**digital literacy.

**Criterion variable:**digital citizenship.

## POPULATION AND SAMPLING

The target population comprises all the higher degree students in the South-Western states of Nigeria.Multi-stage sampling procedure was adopted. In the first stage, south western Nigeria was stratified along the existing six states and simple random sampling was used to select three states (Lagos, Osun and Ekiti). In the second stage, simple random sampling was employed to choose three departments each from two behavioral sciences faculties within the federal universities of the states selected.Random sampling was further used to choose twenty (20) postgraduate students from each of the selected department making sixty (60) research students from a faculty. A total of one hundred and twenty (120) research students were drawn from a federal universityreplicated in two other federal and state universities. For Private universities, random sampling was further employed to choose ten (10) research students from three departments making 30 research students from private universities selected. The sample distribution is shown in Table 1.

**Table 1: Sample Frame**

| S/N | State | University | | |
|-----|-------|------------|------------|------------|
| | | No of Faculty | No of Department | No of Students |
| 1 | State I | 5 | 15 | 270 |
| 2 | State II | 5 | 15 | 270 |
| 3 | State III | 3 | 9 | 150 |
| **4** | **Total** | **13** | **39** | **690** |

## INSTRUMENTATION

Two instruments were developed and validated for the collection of data from participants for this study. These are digital literacy test and digital construct response scale. They are discussed as follows:

## DIGITAL LITERACY TEST

Digital literacy test is an instrument that was developed by the researcher to measure researcher's level of digital literacy. It has two segments. Segment A is on researcher personal data. Segment B is on researcher level of digital literacy of some digital devices used every day in home and offices. The initial test contain 85 items of multiple choice tests with four options letter A, B, C and D. Respondents were asked to pick the correct option. These items were subjected to pilot testing among researchers who were not part of the final sample for the study. The face and content validity was established by giving the draft to psychometricians in the Institute of Education and theconsistency of the scale was investigated through pilot testing of

the instrument on a small sample of 85 researchers outside the main sample. The results were analyzed using Kuder-Richardson method of reliability (K-R$_{20}$) which yielded 0.86.

## DIGITAL CONSTRUCTS RESPONSE SCALE

Digital constructs response scale is a self-reporting instrument that was designed by the researcher. The instrument has three parts. Part A elicits information on researcher's age, experience in the use of internet and breadth of use, current research and the funding agency for the research. Part B was adapted from Nordin, Ahmad, Zubairi, Ismail, Rahman, Trayek and Ibrahim (2015) digital citizenship questionnaire. The original instrument was constructed based on four indicators: Etiquette/Responsibility, wellbeing/health, commerce and security. However, this section was designed based on five indicators: etiquette, responsibility, welfare, commerce and security. The original instrument has a reliability of 0.79 and was used to gather data on digital citizenship of university graduates in Canada.

Section C was adapted from Adoption of Digital Mobile Services questionnaire which is a modified survey questionnaire from Dupegne and Driscoll (2005) based on the work of Rogers who measured consumer's adoption of capacitive switch technology in industrially designed user interface control. Adoption of Digital Mobile Services questionnaire has seven indicators: perceived usefulness, perceived ease of use, trust, personal initiatives, characteristics, context and intention to use. However, this section of the instrument was constructed by the researcher based on four indicators. This is to avoid unnecessary repetition and duplication of items in the Adoption of Digital Mobile Services questionnaire. The four indicators are: usefulness, ease of use, compatibility and risk. The reliability coefficient of the original instrument was 0.75 where it was used by the developer to collect data on mobile student information system of Norwegian University of Science and Technology, Trondheim, Norway. The content validity was determined by giving some copies to experts and its reliability re-determined using Cronbach's Alpha which yielded 0.84 and 0.85 for digital citizenship and category of adoption sub sections respectively.

## DATA COLLECTION AND ANALYSIS PROCEDURE

The researcher himself monitored the data gathering exercise. Four research assistants were co-opted for the study; they were intimated with the objectives of the study and the purpose of theirselection as research assistants. Research assistants were trained on the administration of the instruments for two days before the commencement of the study.The administration was carried out in sequence based on the days and periods allowed by the head of department of the faculties and directors of research institutes used. Data collection exercise lasted eight weeks and the data collected were analyzed by structural equationmodeling (SEM) involving a multivariate analytical technique known as path analysis.

## RESULTS AND DISCUSSION

**Research Question:** Is the model which describes the causal effects among digital nativity, digital literacy, Category of adoption of digital devices and digital citizenship consistent with empirical data?
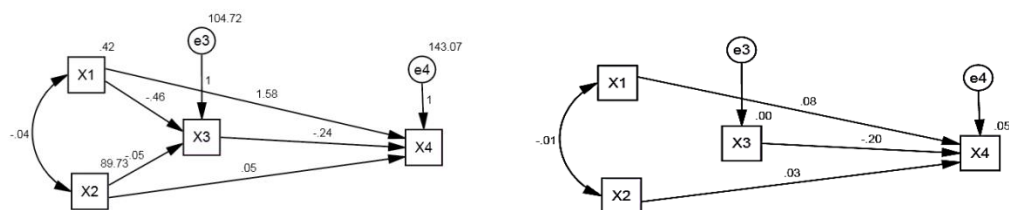


*Figure 1: Hypothesised Recursive Path Model of the Four Variables   Figure 2: Re-specified Model*

Figure 1 shows that four out of the six hypothesised paths were significant and meaningful. Digital nativity and digital citizenship X1-X4 (r = 0.089; p < 0.05), Digital category of adoption of

digital devices and digital citizenship X2-X4 (r = 0.044; p < 0.05), and between digital literacy and digital citizenship X3-X4 (r = -0.203; p < 0.05). The other two paths that were not significant were trimmed off to revalidate the model in order to be consistent with the empirical data. The resulting re-specified model is given in Figure 2.

Figure 2 shows the re-specified model which is consistent with empirical data with the following model fit indices Goodness-of-fit index based on the affinity and other measures of model fit were $\chi^2_{(2)}$ = 2.188; Comparative-Fit Index = 0.99; Absolute-Goodness-of-Fit Index = 0.99; Root-Mean-Square-Error-Approximation = 0.01.Digital nativity (0.95), category of adoption of digital devices (0.05), digital literacy (0.24), accounted for 99.7% of direct effect on digital citizenship, whereas digital literacy (0.01), accounted for 0.3% indirect effects on digital citizenship.This result is in tandem with that of Poushter (2016) who found out that ownership and literacy arising from internet usage is crucial to the ways and manners highly educated parents are more critical of digital technology unlike the uneducated parents that employ it less than averagely educated parents. Although, digital media are accepted as crucial sources of information by parents in the work, the highly educated parents seem to have a bigger factual informationof the dealing with digital platform. This finding is also in tune with that of Spante, Hashemi, Lundin&Algers,(2018)who found out that digital competence and digital literacy are concepts that are increasingly contributed significantly to behaviors of users of digital devices which is dictates the citizenship of users.

**CONCLUSIONS**

The study has established a positive causal relationship among digital nativity, category of adoption of digital devices, digital literacy and digital citizenship. It was found out digital nativity, category of adoption of digital devices and digital literacy had greater direct effects than indirect effects on digital citizenship with four out of the six paths explaining the consistency of the model. It is therefore recommended that higher degree students should consider their digital nativity with inputs from category of adoption digital devices and digital literacy to become digital citizen.

**REFERENCES**

1. Anderson, M., & Jiang, J. (2018).*Teens, social media and technology* Retrieved 17 October 2019fromhttp://assets.pewresearch.org/wpcontent/uploads/sites/14/2018/05/31102 617/PI_2018.05.31_TeensTech_FINAL.pdf. 2018.

2. *Claßen, K., (2012).ZurPsychologie von TechnikakzeptanzimhöherenLebensalter: Die Rolle von Technikgenerationen, Heidelberg: Ruprecht-Karls-UniversitätHeidelberg .*

3. Dennis, D. P. (2018). Digital natives' perceptions on feeling understood by teachers: a transcendental phenomenological study informing 21st century education. Unpublished Ph. D Thesis. Liberty University, Lynchburg, VA. 295 + xiv.

4. Dupagne,& Driscoll (2005). Measuring the perceived attributes of innovation: a case study of capacitive switch technology in industrially designed user interface control. University of Eastern Michigan University. Masters' these and Doctoral Dissertation.

5. Greenhow, C., Robelia, B., & Hughes, J. E. (2009). Learning, teaching, and scholarship in a digital age Web 2.0 and classroom research: What path should we take now? *Educational researcher*, 38. 4: 246-259.

6. Iordache, C., Mariën, I., &Baelden, D. (2017). Developing digital skills and competences: A quick- scan analysis of 13 digital literacy models. Italian *Journal of Sociology of Education*, 9: 1: 6–30.

7. Otunla, A.O. & Jinadu, A. T. (2014). University lecturers' adoption of new educational tech nologies for effective service delivery in undergraduate medical education'. *Journal of Educational Media and Technology*, 18. 1: 48-54.

8. Poushter, J.,(2016). 'Smartphone ownership and internet usage continues to climb in emerging economies: but advanced economies still have higher rates of technology use'. *Retrieved February26th 2016 from* http://www.pewglobal.org/files/2016/02/pew_research_center_global_technology_rep.2016.

9. Rideout, V., and Robb, M. (2018). *Social media, social life: Teens reveal their experiences* Retrieved from *Common Sense Media website*: https://www.commonsensemedia.org/sites/default/files/uploads/research/2018_cs_soc ialmediasociallife_fullreport-finalrelease_2_lowres.pdf. 2018.

10. Rogers, E. M. (2003). 'Diffusion of Innovations (5th edition). New York: Free Press. 2003.

11. Shang, G, John, K &Keng S. (2011). Developing an Instrument to measure the adoption of mobile services. Journal of mobile information system volume 7 pp45-67. IOS press. accessed online from http://www.dx.doi.org/10.3233/mis-2011-0110

12. Spante, M., Hashemi, S. S.,Lundin M. and Algers A. (2018). Digital competence and digital literacy in higher education research: Systematic review of concept use. Cogent Education (2018), 5: 1519143. https://doi.org/10.1080/2331186X.2018.1519143.

13. Thompson, P. (2015). How digital native learners describe themselves. *Education and Information Technologies, 20*. 3: 467-484.