

University Lecturers' Perceived Challenges to the Use of Digital Technologies for Research in the South-west, Nigeria

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Abstract: The trend of research globally in the 21st century demands the usage of digital mobile technologies irrespective of lecturers' gender and university ownership. This paper examined Nigerian university lecturers' gender and ownership on the seeming challenges faced on the usage of digital mobile technologies in conducting research. The study employed the use of a structured questionnaire to describe this research cross-sectionally. 13 federal and state universities in South-west, Nigeria were sampled purposively with 742 respondents been involved in the study. Cronbach Alpha statistical instrument was employed and attained reliability index $r=0.92$ at 0.05 level of significance. Three research questions were answered and two hypotheses were also tested respectively. Research questions 1, 2 and 3 were answered using mean scores, percentages and frequency counts; while independent t-test was used to test hypotheses 1 and 2 at 0.05 level of significance. The study showed that irrespective of lecturer's gender and university ownership, challenges were met while using mobile technologies. This study among others recommends organization of workshops and seminars for lecturers in the university on effective usage of mobile technologies to conduct research. Also, female lecturers in the State Universities should be encouraged and motivated in using digital mobile technologies for research.

Keywords: Mobile Technologies, Gender, University Ownership, Challenges, Research, Collaboration

I. INTRODUCTION

The application of Information and Communication Technologies in academic research has grown-up progressively in the developed and developing countries, thereby revolutionizing all aspects of research conduct. The techniques employed in accessing information and computation power in data processing electronically has made the conduct of complex calculations related to research less stressful. Subsequently, digital libraries afford equal access to instructional resources by everybody in enriching research possibilities everywhere around the globe via the use of digital mobile technologies [1]. Mobile technologies facilitate the generation of new forms of knowledge by improving on existing methods accessing information; thus challenging face-to-face and formal education [2] via access, process and dissemination of research findings electronically.

Globally, university education flourishes on sufficient access to information, especially electronic resources for instruction or pedagogic experiences and research regardless of lecturer's gender and university ownership differences. The academic researches' contribution to the generation of new ideas, concepts and knowledge in the university cannot be over emphasized. The vision of universities globally is to solve societal pressing needs via academic researches that are directed towards knowledge creation, novelty in their utilization and

dissemination in order to facilitate industrial and societal development. Universities are conventionally known as strongholds for knowledge attainment [3], for promotion of research and development desirable for new inventions and intellectual breakthrough at nationwide and global levels (Teacher Development for the 21st Century, 2011) that could result to economic, technological, national and worldwide advancement.

The system of university education in Nigeria comprises private and public universities (as shown in Figure 1). The Nigerian private universities are owned by individuals, religious bodies and organizations, while administration of public universities is conducted by both state and federal governments [4].

Table 1 showed that the approved universities in Nigeria as at 1st August, 2019 are 174 based on the available information on the National Universities Commission websites [4] (NUC, 2019). Their breakdowns are 43 Federal, 52 State and 79 Private universities.

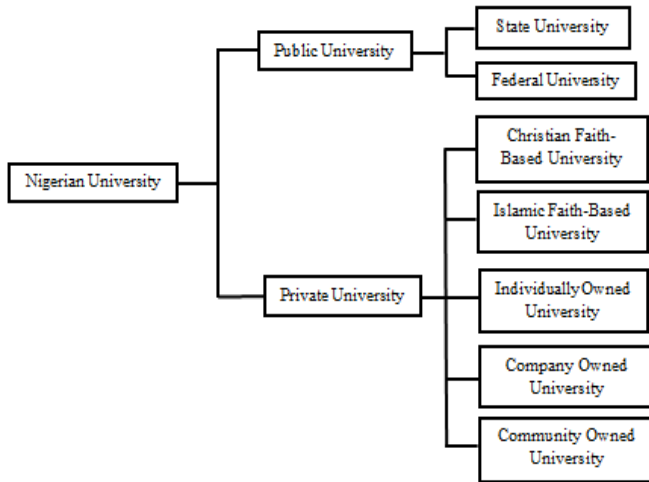


Fig. 1: Classification of Nigerian Universities Based on Ownership (Source: NUC, 2019; [4])

Table 1: Approved Nigerian universities as at August 1st 2019

University Ownership	Federal	State	Private	Total
Frequency	43	52	79	174

Source: [4]

II. LITERATURE REVIEW

Nigerian public universities comprised of federal and state universities that were managed by the government and are located in such a way that each state could boast of a university [4]. The federal universities are under the control of the Federal Ministry of Education, they are most respected institutions because they are well funded than state owned universities. However, State universities were founded by each state in the country; however, State universities are not adequately funded like the federal universities due to the fact that its funding relies on the budgetary allocated to education, which is differently allocated to individual state. Inadequate funding of States universities is exemplified on the quality of facilities procured, students learning experiences [4]; and academic research funding and publications which is one of the strong pillars that is sustaining any nation of the world.

The upward mobility of lecturers to next professional rank is saddled with plethora of opportunities when good research skills are developed to produce academic publications in the referred journal outlets. This implies that academic publications are criterion reference that motivates lecturers to be productive and relevant in their chosen academic community through cross-breeding and updating of knowledge bank. The cliché “publish or perish” is a universal statement that challenges lecturers that want to become known and fulfilled in the university community. However, university lecturers are bedeviled with inability to make their research findings known to

professional colleagues for social, scientific and technological developments via the usage of technologies for research publications.

Research publication is a channel through which lecturers contribute unquantifiable knowledge to the existing frame of knowledge publicly through books, technical reports, journal articles, chapters in a published book and other related scholarly publications [5]. It is one of the essentialities and major yardstick for ranking universities [6] [7] and lecturers’ advancement from a level to another [1]. This implies that advancement of any nation is determined by the nature, outcomes and how findings of research are judiciously utilized [8] [9]. Therefore, it is an established fact that any country that failed to give recognition and priority to research will continue to occupy the global backseat. It is through a well-researched problem that solutions are provided through cutting edge collaboration with professionals. The knowledge of collaboration facilitates harnessing of human capacity in order to spotlight the trend of trans-national analysis of research through instrumentation of research collaborators. The 21st century’ research collaborations are easily facilitated electronically by using newer digital technologies coupled with interdisciplinary team work with professional colleagues that are void of replication of efforts, provision of structure for writing of papers and enhancement of software and tools. The use of newer digital technologies facilitate quick access to information at anywhere and anytime and a steady way of disseminating research reports and findings in form of research publications [1] .

Availability, access and readiness of digital technologies for learning and research have become a major challenge in the developing nations [10] [11] like Pakistan and Nigeria. Unequal access to the use of digital devices remains one of the major challenges confronting academic staff; despite the immense influence the technologies has on accessing and dissemination of information in higher institutions of learning [11] [12] in the developing nations of the world.

Several studies have been carried out on the research publications by university lecturers but not on the domain of using digital technologies. A research conducted by Basse et. al [13] [14] revealed that high percentage of male lecturers had considerable numbers research publications in a referred publishing journal outlets than their female counterparts. In a similar vein, [15] [16] studies revealed that the male lecturers have higher research productivity than their female counterparts. The authors further found out that male devotes considerable time for research publication and scholarly matters than their female counterparts who combines household matters with their career and job related issues.

Lone and Hussain, [17] investigated gender variations in research productivity and the findings showed that comparatively, males averagely have a higher productivity than females’ performance on patent creation,

research productivity and collaboration across sections and disciplines. It was also noted that personal and academic responsibilities limited the research productivity of females. The related variables like marital status, age, number of children and domestic workload are the personal variants that affect the females' research productivity. However, females in the higher education are not adequately less represented numerically, low academic statuses, and insufficient research funds are the related academic factors that are negatively affecting the productivity of research. By implication, female lecturers had significant contributions to teaching than research publications. This means that male lecturers engaged in more research activities than their female counterparts.

On the contrary, Williams et. al [18] study's depicted significant difference in productivity of research between male and their female counterparts. By implication, male and female academic staff differs significantly in research productivity. Based on the university ownership research productivity by the lecturers, [15] and [16] attested that underfunding of Nigerian public universities; especially State University has adverse effects on academic performance of both lecturers and students. The effect has resulted to deficiency in manpower training and development vis-à-vis research conduct, paucity of well-equipped libraries and ICT facilities, research funding and publications by either male or female lecturers.

However, Chiemeké et. al [6] posited that the use of outdated research resources and equipment like library structures with archives of archaic, stale and stocked with irrelevant materials, ill equipped Information and Communication Technology laboratories/centers, use of archaic electronic resources and databases and poor internet connectivity had led to the decline in the quality of output of academic research and instructional delivery in Nigerian public universities. Hence, the use of newer technologies to access and disseminate research findings becomes very paramount in the 21st century. Therefore this study purposively examined the perceived challenges encountered by university lecturers' gender and university type on the usage of mobile technologies in facilitating the conduct of research in the South-western universities in Nigeria.

III. STATEMENT OF THE PROBLEM

Digital technologies are modern, powerful portable, hand-held operating and computing system with touch input or miniature keyboard that can incorporate collaborative pedagogy in order to leverage research and learning scenario [19] and to support data and internet access of the needed information and dissemination [20]. The 21st century' research collaborations are easily facilitated electronically by using newer digital technologies using software and internet enabled tools. The use of newer digital technologies facilitate quick access to information at anywhere and anytime and a steady way of disseminating

research reports and findings in form of research publications [1].

Cai et. al [21] affirmed that attitudinal constructs towards the use of ICT is multifaceted such as the anxiety or comfort (personal emotions); motivation (personal interest); usefulness and self-efficacy of using technological devices in facilitating research and pedagogic experiences. Adedója et. al [22] study revealed that majority of university scholars and tutors had negative attitude towards adoption and utilization of mobile digital technological devices with internet enabled facilities due to their exorbitant prices and poor internet services.

The cliché "publish or perish" syndrome emphasizes the prominence of research publication in academic community [7]. However, many lecturers in the developing nations of the world more often accesses the needed information for research via print media in the library which is traditional and obsolete method. Yusuf [7] found out that the reduction in quality, numerical size and consistency of research publications output among the academic staff of Nigerian universities were due to ill-motivation given to lecturers, poor and irregular funding, declining in supply of research infrastructural facilities, rising workloads associated with sporadic hike in students enrolment against staff ratio, which leaves room for negligible time spared for the conduct of research and lack of research competence and skills on the use of newer technologies. Ogunkunle and Fomsi [23] found out constraints like inability to access Internet facilities, irregular electric power supply and inadequate digital proficiency trainings in handling ICT facilities for research undertaking by the lecturers; irrespective of their gender and place of work (university ownership). Previous studies revealed that the use of ICT had great impact on the productivity of the academic staff [5]; however, there are inconclusive findings on access to ICT based on gender and use of newer mobile technologies in facilitating research based on university ownership.

IV. PURPOSE OF THE STUDY

The aim of this study was to examine the university lecturers' perceived challenges on using mobile technologies for the conduct of research based on the moderating variables of gender and university ownership for research in the South-western states of Nigeria.

V. RESEARCH QUESTIONS

The following research questions guided study:

1. Do the university lecturers perceived challenges in using mobile technologies for research collaboration?
2. Do male and female lecturers in the university perceived challenges to the usage of mobile technologies for the conduct of research?

- Do differences exist between federal and state owned lecturers in the university’ perceived challenges on the use of mobile technologies for the conduct of research collaboration based on their university ownership?

VI. RESEARCH HYPOTHESES

The null hypotheses 1-2 were tested in this study.

Ho₁: There is no significant difference between male and female university lecturers on the perceived challenges faced when using mobile technologies for research collaboration.

Ho₂: There is no significant difference between Federal and State University lecturers on perceived challenges to use of mobile technologies for research collaboration.

VII. MATERIALS AND METHODS

Sample and Sampling Technique

Sample: lecturers from 13 public (State and Federal) universities in the South-western states of Nigeria were purposively sampled and participated in the study. This research cross-sectionally surveyed and described the seemingly challenges faced by Nigerian lecturers towards the usage of mobile technologies in facilitating research collaboration. The respondents comprised of seven hundred and forty-two (742) that were randomly drawn from six (Ogun, Lagos, Ondo, Oyo, Ekiti and Osun) states in the South-western Nigeria.

Instrumentation: The instrument employed was a structured questionnaire to elicit response on the seemingly challenges faced by Nigerian university lecturers towards the usage of mobile technologies in the south-west, Nigeria. A total of 742 out of 1013 copies of questionnaires were returned from the sampled universities. Lecturers’ gender was stratified into male and female; while university ownership was stratified as federal and state universities. Items on lecturers’ perceived challenges were structured to elicit responses from the respondents based on Likert rating scale of Strongly Agreed, Agreed, Disagreed and Strongly Disagreed as “SA”, “A”, “D” and “SA” respectively. The research instrument was faced-validated by five experts of Educational Technology. Cronbach Alpha statistical instrument was employed and attained reliability index $r=0.92$ at 0.05 level of significance. The data generated for the study were gathered, checked, collated and analyzed using inferential and descriptive statistics. Three research questions were answered and two hypotheses were also tested respectively. Research questions 1, 2 and 3 were answered using mean scores, percentages and frequency counts; while independent t-test was used to test hypotheses 1 and 2 at 0.05 level of significance based on lecturers’ gender and university ownership respectively.

VIII. RESULTS

Table 2 depicts the frequency counts of male 455(61.30%) and 287(38.70%) female university lecturers respectively that participated in the study. The frequency count of Federal 470(63.30%) and 272(36.70%) State university lecturers also participated in the study.

Table 2: Percentage Distribution of University Lecturers’ gender and university Ownership

Variables	Frequency	Percent
Gender		
Male	455	61.30
Female	287	38.70
Sum of the Respondents	742	100
University ownership		
Federal	470	63.3
State	272	36.7
Sum of the Respondents	742	100

Research Question One: Do university lecturers perceived challenges in using mobile technologies for research collaboration?

Table 3: University Lecturers’ Perceived Challenges in Using Mobile Technologies for Research Collaboration

S/No	Items on Lecturers’ Perceived challenges encountered	X
1	Cost of mobile network service providers reduces the effectiveness of using mobile technologies.	3.00
2	Scholarly interactions with mobile technologies are constrained by institutional support for their effective usage	3.03
3	Extra training is required by the user in order to effectively	2.50
4	Limited battery life span of mobile technologies is a problem for extensive use.	3.43
5	Power failure has been a hitch for effective use of mobile technologies for research collaboration.	3.66
6	Unstable network connection hinders the usage of mobile devices more often for research collaboration.	3.58
7	Screen sizes are too small to present complex	3.07
8	Difficulties in using mobile technologies hinder their effective acceptance for research collaborations.	2.75
9	Uncontrollable technical faults development reduces mobile technologies usage.	2.59
10	Repair of technical faults developed by these devices are affordable.	2.49
	Sum of mean scores for perceived challenges of use	30.09

Average mean score for lecturers’ perceived challenges in using mobile technologies for research collaboration is 3.01

Items 1, 2, 3, 4, 5, 6 and 8 in Table 3 revealed some of the challenges as: cost of mobile network service providers, lack of institutional support, power failure, unstable network, limited battery life span, lecturers needed extra training in order to effectively use the device, and other related constraints hindered lecturers from maximizing the good use of mobile technologies for research collaboration. The sum of mean and average mean scores of 30.09 and 3.01 respectively attested to high degree of challenges encountered by the lecturers. Therefore, it was concluded

that Nigerian universities lecturers perceived some challenges while using digital mobile technologies for effective research collaboration.

Table 4: Lecturers' Gender Responses on Perceived Challenges

Gender	No	Percent (%)	Sum of mean for PCU	Mean (x)
Male	455	61.30	41.65	3.20
Female	287	38.70	41.90	3.22
Total	742	100.00		

Note: the grand means score for perceived challenges based on lecturers' gender was 3.21

Table 4 showed the male (3.20) and female (3.22) lecturers' mean scores respectively on the challenges encountered while using mobile technologies. The high grand means score of 3.21 out of 4.00 for both male and female lecturers indicated that the lecturers perceived the existence of challenges in using mobile technologies for research collaboration. However, the female lecturers (3.22) perceived the existence of the challenges slightly highly than their male (3.20) counterparts.

Research Question 3

Do difference exists between federal and state owned university lecturers' perceived challenges to the use of mobile technologies for research collaboration based on their university ownership?

Table 5: Lecturers' University Ownership Responses on perceived challenges

University Ownership	No	Percent (%)	Sum of mean for PU	Mean (x)
Federal	470	63.30	42.05	3.23
State	272	36.70	41.23	3.17
Total	742	100.00		

Note: the grand means score for perceived challenges to the use of mobile technologies based on lecturers' university ownership was 3.20

Table 5 depicted the mean scores of lecturers' perceived challenges at the Federal (3.23) and State (3.17) owned universities respectively on the use of mobile technologies. The high grand means score (3.20) showed that lecturers from both federal and state government owned universities encountered challenges on while using mobile technologies to collaborate research. However, lecturers from federal owned universities perceived high existence of some challenges than their counterparts in the state owned universities. It was therefore concluded based on the high grand means score that irrespective of university ownership (federal or state), lecturers encountered some challenges while using mobile technologies in facilitating research collaboration.

Ho₁: There is no significant difference between male and female lecturers' perceived challenges faced when using mobile technologies for research collaboration.

Table 6: Independent t-test of University Lecturers' Perceived Challenges Based on Gender

Gender	No	X	SD	Df	T	Sig.(2-tailed)	Remark
Male	455	29.95	2.95	740	-1.70	0.09	Not rejected
Female	287	30.32	2.91				
Total	742						

Table 6 revealed the result: $t(740) = -1.70, p = 0.09$ ($p > 0.05$). The implication is that the result of the t-value of -1.70 results in 0.09 significant value was greater than 0.05 alpha value. Therefore, the stated null hypothesis failed to be rejected. The levenes test of equality of variance in Table 6 with a significance of .09 ($p > .05$) which implies the adoption of the assumption in the first line which states that equal variance is assumed and the results in the line are also accepted [24]. This also implies that .09 is considered for the sig. (2-tailed) of the independent t-test for equality which shows that there was no significant difference in the mean scores (since sig. (2-tailed) is greater than .05). The implication depicts that there was no significant difference between male and female universities lecturers on perceived challenges in using of mobile technologies for research collaboration. However, the female lecturers perceived been confronted with challenges when using mobile technologies for research collaboration than their male counterpart.

Ho₂: There is no significant difference between Federal and State University lecturers on perceived challenges to use of mobile technologies for research collaboration.

Table 7: Independent t-test of University Lecturers' Perceived Challenges based on the University Ownership

Univ. type	No	X	SD	Df	T	Sig.(2-tailed)	Remark
Federal	470	29.52	2.98	740	-7.26	0.00	Rejected
State	272	31.09	2.59				
Total	742						

Table 7 revealed that $t(740) = -7.26, p = 0.00$ ($p < 0.05$). This implication is that the result of t-value of -7.26 results in 0.00 significant values was less than 0.05 alpha value. Thus, the stated null hypothesis was rejected. The levenes test of equality of variance in Table 10 with a significance of .00 ($p < .05$) which implies the adoption of the assumption in the first line which states that equal variance is assumed and the results in the line are also rejected [24]. This also implies that .00 is considered for the sig. (2-tailed) of the t-test for equality which shows that there was significant difference in the calculated mean scores (since sig. (2-tailed) is less than .05).

By implication on the perceived challenges, there was significant difference between the federal and state university lecturers on the usage of mobile technologies for

research collaboration based on the university ownership in favour of the lecturers in the federal universities. Thus, lecturers in the perception of state universities, the results depicts that they are having more challenges in using electronic resources than their counterparts in the federal government universities for research collaboration.

IX. DISCUSSIONS

The issue of research and publication of research outputs in any tertiary institution globally cannot be underscored. However, considering the avid thirst by Nigerian lecturers to collaborate and publish in referred journal, warrants looking for easier, simpler and faster means by using digital mobile technologies which university lecturers are faced with some challenges as found out in this study. The study found out that the university lecturers faced challenges like: cost on the usage of mobile network service providers, lack of institutional support, power failure, unstable network, limited battery life span, lecturers needed extra training in order to effectively use the device, and other associated challenges from maximizing the judicious usage of mobile technologies for conduct of research collaboration.

The study concurred with Okebukola (2002), Ogunkunle and Fomsi [23] and Samuel [1] that inability to access Internet facilities, irregular electric power supply and extra proficiency training was needed in handling electronic resources were some of the constraints faced by academic in Nigerian tertiary institutions. Also, This study agreed with Chiemekwe et. al [6] that the use of obsolete research facilities like libraries been stocked with irrelevant materials, ill equipped Information and Communication Technology laboratories/centers, use of archaic electronic resources and databases and poor internet connectivity had led to the decline in the quality of academic research output and instructional delivery in Nigerian public universities.

This research revealed that there was no gender bias in the use of mobile technologies in enhancing research collaboration. By implication, regardless of gender differences and lecturers' experienced challenges while using of mobile technologies for research collaboration. However, this study is in favor of the male lecturers. The study agreed with Ogbogu [14], [1] and Lone and Hussain [17] that female lecturers' research output for publication was low compared with their male counterparts due challenges encountered in the usage of electronic resources in facilitating the conduct of research. This study also agreed with Famurewa [15], Halidu [16] and Lone and Hussain [17] studies revealed that the male lecturers have higher research productivity than their female counterparts.

Based on the institutional ownership, the study found out that both federal and state university had challenges of using mobile technologies. This was traceable to poor funding [15] [16] of Nigerian universities in term of infrastructures and needed research facilities and lack of institutional support [23]. The study revealed that lecturers

from State (31.09) Universities experienced slightly higher challenges than their counterparts in the Federal (29.52) Universities due to financial challenges, inadequate electronic resources and low institutional supports given to lecturers. The findings agreed with Mogaji [4] that State Universities are not well supported financially like the federal universities as its financial support depends on allocation earmarked for education budgetary, which was quite different in all the states. The inadequate funding of States universities tells a lot on the lecturers' research productivity; which they financial, moral and professional support.

X. CONCLUSION

This paper examined Nigerian university lecturers' gender and ownership on the challenges faced on the usage of digital mobile technologies in conducting research. The ubiquitous nature and the trend of using newer technologies in accessing and disseminating information anywhere and anytime has been revolutionized by the use digital mobile technologies to analyzed the data collected, collaborate research and publish the findings in referred publication journal. The findings from this study attested that the use of newer digital technologies facilitates quick access to information at anywhere and anytime. It facilitate steady way of disseminating research reports and findings in form of research publications using software and internet enabled tools [1]; despite the challenges encountered by the university lecturers. The findings revealed that the university lecturers are faced with constraints like inability to access Internet facilities, irregular electric power supply and inadequate digital proficiency trainings in handling ICT facilities for research; irrespective of their gender and place of work (university ownership) as agreed with Ogunkunle and Fomsi [23] and Yusuf [7]. Based on gender, findings from this study revealed that the male lecturers have higher research productivity than their female counterparts as agreed with Famurewa [15], Halidu [16] and Lone and Hussain [17]. The implication was that the female lecturers encountered challenges while using digital technologies in facilitating research productivity and collaboration. Based on the university ownership, the findings from this study agreed with [4] that inadequate funding of States universities was exemplified on the quality of facilities procured for academic research and publications which is one of the strong pillars that is sustaining any nation of the world. The cliché publish or perish syndrome compelled university lecturers to cultivate high level of interest and attitude towards the usage of digital mobile technologies in facilitating research activities and collaboration. In conclusion, the trend of research globally in the 21st century demands the usage of digital mobile technologies irrespective of lecturers' gender and university ownership. Thus, university lecturers experienced perennial challenges on the usage of newer technologies for research

collaboration regardless of lecturer' gender and university ownership.

A. Recommendations

The study recommends that:

1. University administrators should endeavor to organize seminars and workshops for all lecturers in the public universities irrespective of their gender and ownership on how to effectively use digital mobile technologies to facilitate effective research and collaboration.
2. All lecturers should be encouraged to use digital mobile technologies in facilitating research irrespective gender differences. However, female lecturers should be well motivated in the use of digital mobile technologies in order to reduce gender lacuna to the barest minimum in facilitating research.
3. University lecturers should be encouraged and motivated to use newer digital technologies to access the needed information and disseminate research findings.
4. Government and administrators should endeavour to provide institutional support and trainings to state owned universities lecturers. Subsequently, the needed institutional support, electronic digital resources and internet facilities should be procured to all lecturers in Nigerian universities irrespective of university ownership.
5. Similarly, individuals and non-governmental organizations should endeavor to provide the needed support to university lecturers on aspects that pertains research productivity, trainings and funding.

XI. REFERENCES

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