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Barriers to Virtual Workplace Implementation in Nigerian Universities

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

This study investigates the potential barriers and employees' stated preference towards virtual workplace implementation in Nigerian universities. A questionnaire was administered to academic and non-academic staff of the University of Benin, Benin City, Nigeria. The questionnaire was divided into two parts; the first part is the respondent profile, followed by the barriers and staff perception towards virtual workplace. The findings showed that 64.6% of the respondents are not willing to accept the option of working from home 1,2,3,4, or 5 days per week if given the opportunity while 34.8% of the respondents said that they would accept the opportunity to work from home and 0.5% of the respondents admit that maybe they might accept working from home. The result also shows that the majority (87.07%) of respondents believed that the current electricity supply would hinder them from performing their work effectively if they accept the option of working from home. Also majority (64.91%) of the respondents believed that poor internet connectivity in the area where they lived would hinder them from working effectively from home if they accept the option of working virtually. The study identified unstable electricity supply, poor internet

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connectivity, and staff perception towards virtual work as barriers that will hinder effective implementation in Nigerian universities. This study concluded that these barriers should be critically examined and a mitigation strategy should be developed before implementing virtual workplace in Nigerian universities.

Keywords: Nigerian universities; remote work; telecommuting; teleworking; virtual workplace.

1. INTRODUCTION

Information and communication technology (ICT) innovation over the past two decades has changed nearly every aspect of life including tertiary education through e-learning, e-library, and virtual laboratory among others [1]. Thus, the globalization of the tertiary education sector is increasing speedily; students receive lectures online and staff can work off-campus (or at home). A virtual workplace provides a platform in which work-related activities are performed using various technological devices [2]. In higher education, a virtual workplace is a virtual platform that allows instructors to interact and work with coworkers, and administrators in a collaborative virtual environment as well as deliver lectures in a virtual classroom to students irrespective of their location in any part of the globe [3]. Interestingly, some universities in the developed nations have keyed into this, and have implemented virtual workplace as a means to reduce employee work trips, parking demand, and carbon emission [4] while others are adopting the use of the sustainable mode of transportation within the university campuses for staff and students [5,6].

Unfortunately, Nigeria's universities are still largely built around the traditional classroom learning approach, with more emphasis on the physical learning environment [7]. However, the recent outbreak of COVID-19 has revealed the inadequacies of this mode of education and the need for the adoption of ICT tools in Nigeria's universities. The effective use of a virtual workplace can act as a catalyst for enhancing research, teaching, and administrative tasks in the Nigerian university system.

However, universities should critically examine the potential barriers to successfully implementing virtual work before implementing this emerging work practice. Some of the barriers identified in the course of the literature review include data security, system compatibility, poor internet connectivity [8], and electric power supply [9].

2. REVIEW RELATED WORKS

Olorunfemi [10] conducted research in Lagos State, Nigeria, to ascertain if it would be feasible to introduce virtual work in four government-owned tertiary schools. In addition to interviewing some executive officers in the chosen institutions for the study, questionnaires were given to women employed by these institutions. The management level officers of the chosen institution expressed a desire to implement flexible work arrangements to improve the quality of work life for female employees and boost worker productivity, according to a significant portion of their responses. The author identified epileptic electricity power supply, and power internet connectivity as factors that will hinder effective virtual workplace implementation in Nigeria.

Onyeukwu et al. [11] carried out a study to examine how virtual workplace implementation could serve as a remedy to the spread of the COVID-19 pandemic. The study identified unstable electric power supply and poor internet services as some of the challenges to virtual workplace implementation in Nigeria. Ogunode et al. [12] carried out research to determine the challenges of deploying Information and Communication Technology (ICT) facilities in the Nigerian higher education sector during the COVID-19 pandemic. The study identified unstable electricity, poor internet services, and inadequate ICT facilities as some of the challenges of ICT implementation in Nigeria. Omolawal [13] investigated the attractiveness of virtual workplace in Lagos State, Nigeria. The study adopted qualitative techniques where some private and public sector organizations participated. The study reveals that virtual work is attractive to employees but identified electricity power outages that often last for days or even weeks, and lack of high-speed internet as some of the challenges that may hinder effective virtual workplace implementation in Nigeria.

2.1 Epileptic Electricity Supply

Nigeria's first power plant, with a total generation capacity of 60KW, was built in Marina, Lagos,

beginning the nation's history as an electricity-producing nation in 1896 [14]. From 1972 to 2006, Nigeria's National Electric Power Authority (NEPA) had exclusive control over the nation's electricity generation, transmission, and distribution [15]. Nigeria's electricity output was steadily declining due to inadequate funding, poor investment, and mismanagement. To improve the nation's access to electricity, the Federal Government of Nigeria introduced the Electric Power Sector Reform Act in 2005. As a result, the Power Holding Company of Nigeria (PHCN), which had long controlled the nation's power generation companies (GenCos) and distribution companies (DisCos), was separated from its authority over both. Power Holding of Nigeria (PHCN) was divided into eighteen (18) separate companies by the Federal Government of Nigeria, including eleven (11) distribution companies, six (6) generation companies, and one (1) transmission company. On November 1, 2013, these companies were finally sold to various private investors [16]. Despite the unbundling of PHCN and subsequent privatization of successor generation companies (GenCos) and distribution companies (DisCos) to private investors, there has been no discernible improvement since the privatization as these private investors have been unable to give Nigerians the much-needed electricity supply that is measurable to international standard [17]. When compared to the nation's expanding population, Nigeria's energy-producing capacity remains insufficient. The country's successive governments have implemented some power reforms to improve the state of the electricity sector, but little progress has been made because many Nigerians, both in rural and urban areas, continue to live in complete darkness. Nigerians have to contend with the epileptic nature of the power supply in the country. Several authors have identified the unstable electricity supply in Nigeria as a major hindrance to virtual workplace implementation in Nigeria [10].

2.2 Poor Internet Connectivity

According to a report from the Nigerian Communication Commission (NCC), there are 224,713,710 active lines as of December 2023. While 219,304,281 people have active internet subscriptions across all operators as of March 2024 [18]. The telecom industry in Nigeria has grown to become the continent of Africa's largest and fastest-growing telecom market [19]. Despite the rise in subscriber numbers and the fact that Nigeria now has some broadband service providers, including Main One, Glo 1, SAT 3, and WACS cable, the dream of Nigerians having quick and dependable internet service remains a pipe dream, and the majority of cases, access is frequently constrained [20]. This is explained by the fact that Lagos hosts a significant portion of the submarine cable landings on the nation's coastlines and that other regions of the nation cannot take advantage of facilities that are thought to have a combined capacity of over 9 Tbit/s because of a lack of distribution infrastructure [21].

The provision of effective and reasonably priced ICT services to the populace has been limited by a lack of ICT infrastructure and services, particularly broadband internet connectivity, in Nigeria. Due to limited bandwidth, consumers in both urban and rural parts of Nigeria's internet remain frustrated and limited in their ability to access high-quality services [22]. To provide users with high-quality, reasonably priced service, it is necessary to modernize existing telecommunications facilities and increase the available bandwidth. Several authors such as [10] have identified poor internet connection from mobile operating companies in Nigeria as a major barrier to effective virtual workplace implementation in Nigeria.

This study, therefore, examine the barriers and staff perception towards virtual workplace in Nigerian universities. The objectives of this study are:

a) examine university staff preference towards virtual workplace
b) examine whether the decision of university staff to accept virtual workplace will affect their productivity
c) identify barriers that will hinder virtual workplace implementation in Nigerian universities?

3. MATERIALS AND METHODS

To determine the barrier and staff perception towards virtual workplace implementation in Nigerian universities, a two-page questionnaire was prepared with Google form and the invitation to participate in the survey was sent to the official email address of staff of the University of Benin, Benin City, Nigeria. The researcher also self-administered the questionnaires to both academic and non-academic staff of the University of Benin, Benin City, Nigeria. The questionnaire was divided into two parts; the first part is the respondent profile, followed by the

barriers and staff perception towards virtual workplace. The study adopted the face validity and pilot study methods to obtain the reliability of the questionnaire. The face validity of the questionnaire was carried out by three experts, feedback and comments from the experts were used to refine the questionnaire. A pilot study was then conducted using 29 respondents to check the effectiveness of the questionnaire. The responses from the pilot study were then used to perfect the questionnaire. The questions were structured in a way that leads from general to specific questions to determine the barriers and perceptions of university staff towards virtual workplace implementation. The response obtained from the questionnaire was analyzed using MINITAB 19.

4. RESULTS AND DISCUSSIONS

4.1 Demographic Profile of the Respondents

Table 1 summarizes the demographic profile of the respondents by frequency distribution.

Table 1 shows that the largest sets of respondents are male academic staff (66.33%) and female non-academic staff (58.89%). The combined responses (both academic and non-academic) show that of the 379 respondents, 54.35% were males and 45.65% were female. Table 1 depicts the respondents' age distribution. 40.70% of the academic staff respondents are between the ages of 36-45 years while 41.11% are between the ages of 36-45 years. Table 1 also revealed the combined age distribution (both academic and non-academic) with the highest number of respondents (41.95%) are between the ages of 36-45 years. This is closely followed by 32.72% in the ages of 20-35 years. The third highest number of respondents (15.04%) is between the ages of 46-55 years. Finally, 10.29% of the respondents are from ages 56 years and above. The result shows that the majority (74.67) of the respondents (both academic and non-academic) who completed the questionnaire are between the age of 20-45 years. Respondents were asked to indicate their highest academic qualification. The distribution of respondents' highest academic qualification in Table 1 shows that 53.27% of the academic staff respondents have a Master's degree while 41.71% hold a PhD degree. 56.67% of non-academic staff respondents have a B.Sc. and 32.22% have completed their Master's degree. Analysis of the combined response (both academic and non-academic staff) shows that 1.32% have Secondary school certificate, 2.37% have OND/Diploma, 1.32% have HND, 29.55% of respondents have obtained B.Sc., 43.27% of respondents have completed their Master`s degree, while 22.16% hold PhD degree. Of the 379 respondents, 199 (52.5%) of respondents were academic staff while the remaining 180 (47.5%) were non-academic staff.

Table 1. Demographic profile

	Academic Staff		Non-Academic Staff		Combined	
	Frequency (N=199)	**Percent**	**Frequency (N=180)**	**Percent**	**Frequency (N=379)**	**Percent**
Gender						
Male	132	66.33	74	41.11	206	54.35
Female	67	33.67	106	58.89	173	45.65
Age of the Respondents						
20-35 years	60	30.15	64	35.56	124	32.72
36-45 years	85	42.71	74	41.11	159	41.95
46-55 years	28	14.07	29	16.11	57	15.04
56 years and above	26	13.07	13	7.22	39	10.29
Highest academic Qualification						
Secondary school certificate	0	0	5	2.78	5	1.32
OND/Diploma	0	0	9	5.00	9	2.37
HND	0	0	5	2.78	5	1.32
B.Sc.	10	5.02	102	56.67	112	29.55
Master`s	106	53.27	58	32.22	164	43.27
PhD	83	41.71	1	0.55	84	22.16
Respondents Staff Category	199	52.5%	180	47.5%	379	100

4.2 Staff Stated Preference towards Virtual Workplace

The staff responses to the acceptance of virtual workplace are summarized in Table 2.

When asked whether they would accept the option to work from home 1,2,3,4, or 5 days per week if given the opportunity. 34.83% of the respondents say that they will accept the opportunity to work from home whereas 64.6% say that they will not accept the option of working from home, and 0.5% of the respondents admit that maybe they might accept working from home. Whereas 40.70% of the academic staff agreed that they would accept the opportunity to work from home only 28.33% of non-academic staff agreed to accept the offer to work from home. Thus there is a positive attitude towards virtual workplace among academic staff than their non-academic staff counterpart. This finding on a higher number of academic staff decision to accept the offer to work 1,2,3,4, or 5 days away from the office as compared to the non-academic staff is in line with similar research carried out by Ismail et al [23], where 29% of academic staff were reported to be more willing to accept virtual workplace than the administrative staff. Although further research need to be carried out in other to determine why academic staff are more willing to accept virtual work. One can also attribute it to the fact that academic staff duties involves teaching and research, which are considered to facilitate virtual work. Whereas the duties of the non-academic are more of administrative work. It is evident from the present result that respondents were not willing to accept virtual workplace. One of the reasons identified in previous research why some employees are reluctant to accept a virtual workplace may be a result of fear that working virtually will hinder them from promotion opportunities [24].

The research also investigated whether the respondents would accept the option to work from home assuming their salary remained the same and the university asked them to pay all the costs associated with them working at home or the salary remain the same and the university pays all the cost associated with them working from home.

Table 2. Response to the question on whether they will accept the option to work from home 1,2,3,4, or 5 days per week if given the opportunity

	Academic Staff		Non-Academic Staff		Combined	
Response	Frequency (N=199)	Percent	Frequency (N=180)	Percent	Frequency (N=379)	Percent
Yes	81	40.70	51	28.33	132	34.83
No	118	59.30	127	70.56	245	64.64
Maybe	0	0	2	1.11	2	0.53

Table 3. Response to the question on the option to work from home

Assuming that your salary remains the same and the University asks you to pay all the costs associated with you working from home, will you accept working from home?						
	Academic Staff		Non-Academic Staff		Combined	
Response	Frequency (N=199)	Percent	Frequency (N=180)	Percent	Frequency (N=379)	Percent
Yes	29	14.57	24	13.33	53	13.98
No	169	84.92	154	85.56	323	85.22
Maybe	1	0.50	2	1.11	3	0.79
Assuming that your salary remains the same and the University pays all the costs associated with you working from home, will you accept working from home?						
	Academic Staff		Non-Academic Staff		Combined	
Response	Frequency (N=199)	Percent	Frequency (N=180)	Percent	Frequency (N=379)	Percent
Yes	80	40.20	61	33.89	141	37.20
No	113	56.78	118	65.56	231	60.95
Maybe	6	3.02	1	0.55	7	1.85

The respondents were also asked whether they would accept the offer to work from home assuming their salary remained the same and the University management asked them to pay all costs associated with them from working from home. Interestingly, only 13.98% of the respondents agreed to work from home with the majority of the respondents (85.22%) rejecting the offer to work from home. To investigate further, whether the respondents were willing to work from home if their salary remained the same and the university paid all the costs associated with them working from home. Only 37.20% of the respondents indicated their willingness to work from home if the university management is ready to pay the associated cost with them working from home but 60.95% of the respondents are not keen on accepting the offer to work from despite the incentive, while 1.85% of the respondents are indifferent.

However, similar results were reported by an earlier study by Siddhartha and Chaitra [25], where 66% of the respondents indicated their willingness to work from home assuming their salary remains the same and the employer pays the cost, with 22% admitting that they did not rule out the option. The respondents' aspirations were weakened when they were asked whether they would accept the offer to work from home assuming their salary remained the same and employees pay all costs associated with working from home. The percentage of those willing to work from home drops to 38% if the employees are to pay telephone calls and to 29% if they are to bear the cost of buying a new personal computer and other devices that are needed. According to the model developed in an earlier study by Bernardino et al [26], virtual workplace costs tend to impact negatively on employees' decision to telecommute if they are asked to incur the cost of working from home. This finding from this research confirms widely expressed thought in the literature that if employees are allowed to pay the cost of equipment needed to implement a virtual workplace, it will negatively affect their decision to accept it. Thus, employers are encouraged to provide the employees with all necessary equipment such as laptops and printers.

4.3 Job Suitability

The staff responses whether their job is suitable for virtual workplace are summarized in Table 4.

With regards to job suitability for virtual workplace, only 26.12% believe that their job can be performed at home while 72.56% think that their job cannot performed at home. The remaining 1.32% of respondents were indifferent. The reasons for the majority of the staff indicating that their job cannot be performed at home can be attributed to the fact that Nigerian Universities are run on a paper-based communication. Thus, these findings suggest that for virtual workplace to be implemented effectively there is a need for a change from paper based approach to computer based.

When asked whether the decision to work from home will affect their productivity negatively, the following responses were given in Table 5.

31.40% of the respondents believe that working at home will most likely affect their productivity negatively as they are likely to be distracted by their spouse, children, and friends or by other activities while 15.30% think that it is very unlikely to affect their productivity negatively in anyway. 20.05% of the respondents are not certain whether the decision to work from home will affect their productivity negatively. 20.58% believe that working from home will likely affect their productivity negatively. This finding was found similar to that conducted by Dane Institute for Research [27] were majority of the respondents identified distraction from spouse and children as a major challenge faced while working at home in Lagos during the lockdown. However, in another study conducted by Iyore [28] during the COVID-19 lockdown in Nigeria, majority (60%) of the respondents claimed to be more productive working from home. According to Alyssa et al [29] studies have shown that employees who work from home are 4% more productive than their counterpart working in the office.

4.4 Barriers to Virtual Workplace Implementation

To identify the likely barriers to virtual workplace implementation among staff, respondents were asked to indicate whether or not the current state of electricity and internet connectivity in the area where they live will enable them to carry out their work effectively at home if they are offered the opportunity. The following responses in Table 6 were given.

The result in Table 6 shows that the majority (87.07%) of respondents believe that the current state of the electricity supply will hinder them from performing their work effectively if they

accept the option of working from home. Similar findings were reported in other studies. In a study conducted [10] among women workers in Lagos State higher institution, poor and erratic power supply in Nigeria was identified as one of the reasons why virtual workplace implementation is not viable in Nigeria. In another study conducted by Sunday and Ocheni [30] in some selected public and private Universities in Nigeria, the majority of the respondents, especially from Nigerian Public Universities describe the electricity supply to their offices as irregular and inadequate. A report from the U.S. Energy Information Administration Country Analysis Brief (2020) ranked Nigeria's net electricity generation per capital as one of the lowest globally [31]. This has led to a situation where the demand for electricity in Nigeria far exceeds the generation, resulting in load shedding, blackouts, and dependence on electrical power generators by consumers. A recent study that was conducted among staff that works at home during lockdown measures put in place by the Nigeria government to curtail the spread of coronavirus in March 2020 shows that the majority of respondents identify unstable electricity supply and poor/expensive internet packages as some of the challenges encountered working from home. Some respondents also acknowledge the fact that they spend a lot of money to fuel their generators and also buy internet subscriptions in a bid to deliver on their jobs [32]. This result is in line with existing research by Adaku [33] Adaku [34] that identified the non-availability of reliable

Table 4. Job suitability for virtual workplace

	Academic Staff		Non-Academic Staff		Combined	
Response	**Frequency (N=199)**	**Percent**	**Frequency (N=180)**	**Percent**	**Frequency (N=379)**	**Percent**
Yes	74	37.19	25	13.89	99	26.12
No	121	60.80	154	85.56	275	72.56
Maybe	4	2.01	1	0.55	5	1.32
Total	**199**	**100**	**180**	**100**	**379**	**100**

Table 5. Response to the question on whether the decision to work from home will affect their productivity

	Academic Staff		Non-Academic Staff		Combined	
Response	**Frequency (N=199)**	**Percent**	**Frequency (N=180)**	**Percent**	**Frequency (N=379)**	**Percent**
Most likely	60	30.15	59	32.78	119	31.40
Very likely	36	18.09	22	12.22	48	12.66
Likely	26	13.06	22	12.22	78	20.58
Not sure	38	19.10	38	21.11	76	20.05
Very unlikely	39	19.60	39	21.67	58	15.30

Table 6. Electricity supply, and internet connectivity

Do you think that the current state of electricity supply in the area where you live will enable you to carry out your work effectively from home?						
	Academic Staff		**Non-Academic Staff**		**Combined**	
Response	**Frequency (N=199)**	**Percent**	**Frequency (N=180)**	**Percent**	**Frequency (N=379)**	**Percent**
Yes	25	12.56	24	13.33	49	12.93
No	174	87.44	156	86.67	330	87.07
Maybe	0	0	0	0	0	0
Do you think that the internet connectivity in the area where you live will enable you to carry out your work effectively from home?						
	Academic Staff		**Non-Academic Staff**		**Combined**	
Response	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Yes	83	41.71	49	27.22	132	34.83
No	115	57.79	131	72.78	246	64.91
Maybe	1	0.50	0	0	1	0.26

power supply in Nigeria as a major hindrance to the uptake of virtual workplace in Nigeria. Thus, this research suggests that there should be development of a mitigation strategy for the recurring issue of epileptic supply in Nigeria before the implementation of virtual workplace.

On whether the internet connectivity in the area where they live will enable them to work effectively from home if given the opportunity, 34.83% of respondents believed that internet connectivity in the area that they lived will enable them to work from home whereas the majority (64.91%) believe that it will hinder them. This finding is also consistent with the result of the study by Olorunfemi [10] where poor internet connection among different internet service providers in Nigeria was described as being below the expected standard, and 62% of the respondents in the study expressed their displeasure over the quality of the internet access provided by their organizations. In another study conducted by Chinedu et al [35] in some selected private universities in Nigeria, poor internet access was identified as one of the factors affecting the utilization of e-learning facilities in Nigeria. Other studies also reported that poor internet connection is a major obstacle to the implementation of virtual workplace in Nigeria [32-34]. According to Alison et al [36] despite the enormous growth that has been recorded in the telecommunication sector in Nigeria, the quality of voice and data services is still poor with browsing speed slow and erratic. A recent report that was released by the Nigerian National Broadband Plan 2020-2025 shows that only 37% of the nation's population is currently enjoying 4G coverage whereas internet services to the remaining population are via 2G and 3G with download speeds incomparable with other nations. Based on the result obtained, this study recommends that the internet connectivity issue should be critically examined and a mitigation strategy developed before virtual implementation.

5. CONCLUSION AND RECOMMENDATION

The adoption of virtual work in Nigerian Universities could be a viable solution to mitigate the impacts of the recent removal of subsidy on premium motor spirit (popularly known as petrol) by the Federal Government of Nigeria which has resulted in more than one hundred percent (100%) increase in transportation fare. However, epileptic electricity supply, poor internet connectivity, and staff perception may be a major barrier to virtual workplace implementation in Nigerian universities.

Therefore, this research suggests that outside the infrastructure concerns, there is a need for employees to change their perception about the virtual workplace and must be ready to accept such work arrangements for it to be effectively implemented in Nigeria.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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