with warning of attacks, training civil defense forces and monitoring networks in order to segregate between civilian objects and military objectives during cyber operations.

REFERENCES

- Amna Adnan Khawaja cyber warfare and international Humanitarian Law https://dlpforum.org/2022/8/17/cyber-warfare-and-international-humaniterian-law/ https://www.imperva.com/learn.application-on-security/cyber-warfare/
- International institute of Humanitarian law. https://www.onlinelibrary.iihl.org..pdf https://blogs.icrc.org/law-and-policy-.2023/03/07/towards-common-understanding-the-appplication-of-ihl-principles-to-cyber-operations/
- Additional protocol I to Geneva Convention (API) https://www.graquantum.com/cyber-warfare-and-application-of-ihl/

DESIGN OF PRE-HEATER OF A PALM KERNEL OIL EXTRACTION MACHINE

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ABSTRACT

*P*alm kernel can be preheated before the palm kernel oil is extracted with the application of a screw press. Failure of the existing pre-heater unit of the extractor due to shape of the barrel, absence of insulation to prevent heat loss to the surrounding, without a stirrer for the uniform distribution of heat and poor design of the heating element necessitated the need for the pre-heater redesign. The objectives were to study existing palm kernel oil extraction methods, re-design a pre-heater that would evenly distribute heat enough for the palm oil extraction, ensure the pre-heater to be efficient and easy to operate. Details of lacks in existing pre-heater were taken, relevant theories including circular motion were applied in the design and heat loss analysis in respect of the methodology. The pre-heater design barrel capacity was found to be of 0.12m^3, a height of 580mm with diameter of 520mm, shaft diameter of the stirrer being 27mm and a power requirement from a 0.23kW electric motor. It was also predicted that the pre-heater heating efficiency was 97.75%, with a heater capacity of 7.2kW and heating time of 13.66 minutes for the temperature of kernel of mass of 56kg to rise to 50°C.

Keywords: Palm Kernel, Oil, Extraction, Pre-heater

INTRODUCTION

Palm tree is one of the economic plants that are grown in the tropics, and Nigeria has a lot of oil palm plantations owned by private individuals as well as large organizations. There is no part of this tree that is not useful, and for the fruit – palm oil is derived from the mesocarp, and the chaff when dried can be used as fuel for heating, the endocarp (shell) can also be used as fuel for heating, as an aggregate in concrete and for filling marshy grounds; while palm kernel oil (PKO) can be extracted from the endosperm (palm kernel nut) as well as using the byproduct (palm kernel cake) as a constituent in animal feed. Oil palm kernels contain 75 to 80% oils which can be extracted using either solvent, mechanical extraction, or traditional extraction (Demirel et al., 2022). It is essential to properly key into the oil palm industry by developing the needed potentials, including knowledge, machines, competitiveness and sustainability to harness its economic fortunes. Sustainability is an important factor in the global market (Pohl and Loong, 2016).

Palm kernel can be preheated before the palm kernel oil is extracted with the application of a screw press. The heating temperature, duration of heating, and moisture content are variables that influence the PKO yield. But, since the difference in mean PKO yields were not significant for 50, 90, and 130°C except for the ambient (30°C), it is more economical to heat at the lowest

temperature that is higher than the ambient (i.e. 50°C) (Ezeoha et al., 2020). That is their research shows that yield is higher between ambient temperature and 50°C. The heating is actually carried out for a specified duration, and considering moisture content. The best whole kernel heating temperature for 10 min heating duration for oil-palm kernel at 3% moisture content (w.b) was 50°C (Ezeoha et al., 2020). Three methods have been identified for the extraction of palm kernel oil, which include mechanical extraction, solvent extraction, and traditional methods. The three basic steps in the mechanical method are kernel pre-treatment, screw pressing and oil clarification (Food and Agriculture Organization of the United Nations, FAO, n.d). Failure of the existing pre-heater unit of the extractor due to shape of the barrel, absence of insulation to prevent heat loss to the surrounding, without a stirrer for the uniform distribution of heat and poor design of the heating element necessitated the need for the pre-heater redesign. The objectives were to study existing palm kernel oil extraction methods, re-design a pre-heater section that would evenly distribute heat enough for the palm oil extraction, and ensure the pre-heater to be efficient and easy to operate. The methodology considered details of lacks in existing pre-heater, and relevant theories including circular motion were applied in the design.

Mass of palm kernel in the loading chamber, temperature and duration of heating are useful in the determination of the heater capacity. The pre-heater design for the chamber containing the palm kernel is a combination of a cylinder and a frustum of a cone. The volume of each of these sections has been given by (Roy, 2021). Heat loss through the cylinder is radial; and for the entire chamber, it can be analyzed taking into account the different sections and materials of the walls including insulation. The use of a combination of materials with varying thermal/mechanical properties often helps provide desired performance characteristics for engineering structures and systems (Zhou et al., 2021). As the stirrer shaft of the pre-heater turns, it whirls the kernels in a uniform circular motion. This principle can be applied in determining the shaft torque and influence its diameter and power requirement of the machine. Application of uniform circular motion in daily life include motion in areas such as in vehicle wheels, the planets, the atomic theory and satellite (Ponimin et al., 2017).

THEORY/ METHODOLOGY

Design

The elements in the design include: cylindrical barrel, and insulation, stirrer shaft, heating system (pre-heater section) and electric motor.

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Barrel Capacity

Considering kernel mass of 70kg,

The volume is given in equation (1)

$$V_b = M/\rho \quad (1)$$

where M = 70kg = mass, ρ = 589kg/m^3 = density of palm kernel, V_b = volume of the barrel,

$V_b = 0.12m^3$

Figure 2 shows cylindrical sections which heat is flowing through, and heat loss in the the cylindrical part of

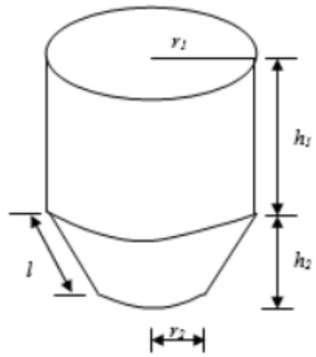


Figure 1: Cylinder and Frustum of Cone of the Barrel

Considering barrel geometry consisting of a cylinder and frustum of a cone as shown in Figure 1, then the volume is

$V_b = \pi r_1 h_1 + 1/3(\pi h_1)(r_1^2 + r_1 r_2 + r_2^2)$ (2)

$r_1 = 0.26m$ = inner radius of cylindrical section, r_2= 0.09m = inner radius at cone frustum bottom, h_1= 0.38m = height of cylinder, $h_2 = 0.2m$ = height of cone frustum, $h = h_1 + h_2$ = total height of barrel.

Thickness of insulation (rock wool) is

$t_{rw} = R - r_1$ (3)

where R = 0.3m = outside radius of cylinder section; $t_{rw} = 0.3 - 0.26 = 0.04m$.

Heat Loss Analysis

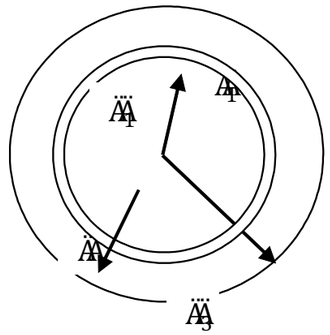


Figure 2: Heat Transfer through a Cylinder

Figure 2 shows cylindrical sections which heat is flowing through, and heat loss in the the cylindrical part of the barrel can be estimated using equation (4).

Figure 2 shows cylindrical sections which heat is flowing through, and heat loss in the cylindrical part of the barrel can be estimated using equation (4).

$q = 2\pi L(T_1 - T_3)/[ln(r_2/r_1)/k_s + ln(r_3/r_2)/k_{rw}) + ln(r_4/r_3)/k_s]$ (4)

$r_1 = 0.26m, r_2 = 0.263m, r_3 = 0.303m, r_4 = 0.306m$

Considering the cylindrical barrel of $h_1 = L$, steel thickness of 3mm, rock wool thickness of 40mm, thermal conductivity of steel = ks = 45W/mK, thermal conductivity of rock wool = krw = 0.076W/mK, T_1 = (50°C) = temperature of pre-heated kernel, T_3 = 30°C = temperature of outside surface of barrel, and only conduction heat loss,

$q = 2\pi(0.38)(50 - 30)/[\ln(0.263/0.26)/45 + \ln(0.303/0.263)/0.076) + \ln(0.306/0.303)/45]$

$q = 25.63W\ (0.026kW)$

Considering the bottom section being a frustum of cone with curved surface area = $\pi(r_1+r_2)l$, $h_2 = 0.2m$ part of the barrel and steel thickness of 3mm, the slant height of frustum, l (not full cone) is given as

$l = (h_2^2 + (r_1 - r_2)^2)^{1/2}$ (5)

$l = 0.26m$

using

$q = \pi l(T_1 - T_3)/[ln(r_1 + r_2)_o/(r_1 + r_2)_i k_s + ln(r_1 + r_2)_o/(r_1 + r_2)_i/k_{rw} + \ln(r_1 + r_2)_o/(r_1 + r_2)_i/k_s]$ (6)

where subscripts o and i are outer and inside,

$(r_1 + r_2)_o = (0.263 + 0.091); (r_1 + r_2)_i = (0.26 + 0.09); (r_1 + r_2)_o = (0.303 + 0.105); \quad (r_1 + r_2)_i = (0.263 + 0.091); (r_1 + r_2)_o = (0.306 + 0.106); (r_1 + r_2)_i = (0.303 + 0.105)$

$q = 8.74W(0.0087kW)$

If the mean of the radii of the frustum is taken and then treated as a cylinder and applying equation (4), such that

$r_m = (r_1 + r_1)/2$

$r_m = (0.26 + 0.0.09)/2 = 0.175m$

$r_1 = 0.175m$, $r_2 = 0.178m$ (that is plus 3mm plate thickness), $r_3 = 0.218m$ (that is plus 40mm insulation thickness), $r_4 = 0.221m$ (that is plus 3mm plate thickness), then

$q = 9.41W(0.0094kW)$ which is higher.

Considering the heating element housing, steel thickness = 3mm (0.003m), rock wool thickness = 75mm (0.075m), L = 0.405m, r_1= 0.137, r_2= 0.14m, r_3= 0.18m

$q = 2\pi(0.405)(50 - 30)/[\ln(0.14/0.137)/45 + \ln(0.215/0.14)/0.076)$

q = 8.98W (0.009kW)

Ignoring radiation heat loss but taking into account convection heat loss between the air in the barrel and the cover (assuming full covering of material), then from (Albayani et al., 2018; Holman, 1997)

$q_{conv} = h_o A(T_w - T_a)$ (7)

where q_{conv}= convection heat loss, h_o = convection heat transfer coefficient, A = heat surface area, T_w = wall temperature, T_a = ambient temperature.

Yener et al. (2019) in their study which involved convection coefficient estimation of still air, reported a value of 25.32W(m²K) for steel.

Considering the slow turning in the barrel, this value will be adopted, and convection heat loss between the air in the barrel being at a higher temperature (instead of ambient) and the cover. Taking $T_w = T_3$, $T_a = T_1$ (higher temperature), then

$q_{conv} = 107.55W\ (0.11kW)$

Considering the conduction heat loss between the cover (0.003m thick for inside and outside plates, 0.04m insulation) inside and outside, using

$q_{cond} = (T_1 - T_3)/[(dx_s/k_s A) + (dx_{rw}/k_{rw} A) + (dx_s/k_s A)]$ (8)

where dx_s = thickness of steel material for outside of cover and for outside as well, $dx_{rw} = t_{rw}$ thickness of insulation (rock wool)

$q_{cond} = 8.05W\ (0.0081kW)$

Total heat (power) loss is

$q_t = 0.026 + 0.0087 + 0.11 + 0.0081 = 0.153kW$ (neglecting heating element housing losses)

$q_t = 0.026 + 0.0087 + 0.009 + 0.11 + 0.0081 = 0.162kW$ (considering heating element housing losses).

The heat absorbed by the kernel is

$Mc_p(T_1 - T_2) = P_s t_s$ (9)

where M = 56kg (mass of 80% of volume) = mass of kernel considered, T_2 = 30°C = temperature of kernel before pre-heating, t_s =10min = time, P_s = power supplied, c_p= 5270J/kgK = specific heat capacity of palm kernel taken as average considering a range from 3980J/kgK for dura to 6550J/kgK for pisifera; the values published were 3.98, 4.13 and 6.55J/g°C (Ezeoha et al., 2012; Gbadamosi, 2006).

$56\ (5270)(\ 50 - 30) = P_o(10)(60)$

$P_s = 9837.33W\ (9.84kW)$

To reduce heating cost but slightly raising time requirement by using heating element capacity of 7.2kW, then t_s = 13.66min.

The power absorbed is

$$P_a = P_s - q_t \quad (10)$$

$P_a = 7.2 - 0.153 = 7.047kW$

The efficiency of the pre-heater neglecting heating element housing losses is

$$\eta = (P_a/P_s)100\% \quad (11)$$

$\eta = (7.047/7.2\ )100\%$

$\eta = 97.88\%$

The efficiency of the pre-heater considering heating element housing losses is,

η = (power absorbed /power supplied) x 100 %

$\eta = (7.038/7.2\ )100\%$

$\eta = 97.75\%$

Percentage heat loss difference from neglecting heating element housing l

osses and considering heating element housing losses is

Percentage heat loss difference = 97.88 – 97.75 = 0.13%, which is not significant.

Stirrer Shaft Design

Assuming that the kernels are being whirled in a circular path as the shaft turns, and that the force exerted is

$$P_r = \mathcal{T}/r \quad (12)$$

where $\mathcal{T}$ = torque

But force is also

$$P_r = Ma \quad (13)$$

where α = acceleration

Equating (12) and (13)

$$\mathcal{T} = Mra \quad (14)$$

considering centrifugal acceleration

$$a = v^2/r \quad (15)$$

where v = velocity

knowing that

$$v = r\omega \quad (16)$$

where, ω = 2πN/60 = angular speed, N = 32 rpm = rotational speed

using equation (15) and and putting v in equation (14), then

$v = 0.87$m/s, $a = 2.9m/s^2$

The force acting on the vertically rotating shaft from equation (13) is

$P_r = 70\ (2.91) = 203.7N$

using equation (14),

$\mathcal{T} = 70(0.26)(2.91) = 52.96Nm$

The stirrer shaft diameter is

$$d_s = (32\ n_s\ (M^2 + \mathcal{T}^2)^{\frac{1}{2}}/\pi S_y)^{1/3} \quad (17)$$

where = n_1 x n_2 = 3 x 3, S_y = 250N/mm^2 = yield strength of A36.

Putting values into equation (17),

$d_s = 0.027m\ (27mm)$

Electric Motor Power

The power transmission is given in equation (18)

$$P_o = \mathcal{T}\omega \quad (18)$$

where P_o = electric motor power

$P_o = (52.96)(3.35) = 177.42W$

Power factor of the electric motor, PF = 0.7

$$P_{loss} = P_o(1 - PF) \quad (19)$$

where P_{loss} = electric motor power loss

$P_{loss} = 177.42(1 - 0.7) = 53.23W$

Total power of the electric motor,

$$P_t = P_o + P_{loss} \quad (20)$$

$$P_t = 177.42 + 53.23 = 230.65W\ (0.23kW)$$

Electric Motor Support

Assuming combined direct and bending stresses on the two angle bar supports, so that

$$\sigma_y/2 = \sigma_d + \sigma_b$$

$$\sigma_y/2 = (P/A) + (M_{max}\text{y/I}) \quad (21)$$

where, P = force, A = area, σ_y = 250N/mm^2 = yield strength of A36, σ_d = direct stress, σ_b = bending stress, $\sigma_y/2$ = design stress, σ_{des} , y = t/2, I = I_{xx} = moment of inertia, M_{max} = maximum bending moment.

Considering combined mass of electric motor and shaft of 15.2kg, the force is

$$P = Mg \quad (22)$$

where g = 9.81m/s^2 = acceleration due to gravity

$$P = (15.2)(9.81) = 149.11N,$$

and L-section angle bars of 42mm wide and 480mm long for each, the area is

$$A = (L)(b)\text{A} \quad (23)$$

where L = 0.48m = length, b = 0.042 width, for the two then,

$$A = (0.48)(0.042 + 0.042) = 0.04m^2$$

The maximum bending moment due to the load on the angle bar is

$$M_{max} = PL/4 \quad (24)$$

$$M_{max} = (149.11)(0.48/4) = 17.89Nm$$

The moment of inertia for the L-section is

$$I_{xx} = I_{xx1} + I_{xx2}$$

$$I_{xx} = bt^3/12 + (b - t)t^3/12$$

$$I_{xx} = (2bt^3 - t^4)/12 \quad (25)$$

where, t = thickness of angle bar

Putting value in equation (21),

$$124996272t^3 - 10499687t^2 + 107.34 = 0$$

Dividing through by 107.34 and multiplying through by 100, then

$$116448870t^3 - 9812792t^2 + 100 = 0 \quad (26)$$

Solving the cubic equation (26), $t_1 = -0.0031m$, $t_2 = 0.0033m$, and $t_3 = 0.0842m$,

But t2 is the realistic solution, so that

$t = 0.0033m\ (or\ 3.3mm)$, use 4mm.

Design of Heating Element Current and Voltage

The design of the heating element is based on a power consumption consideration of 7200W and voltage supply of 240/415V. For many years now, the supply voltage for single phase AC is systems in Nigerian electricity supply industry (NESI) has been 240 + /- 6%, giving a possible spread of voltage from 226V to 254V. For three-phase supplies, the voltage was 415V +/- 6%, the spread being from 390V to 440V (Oyebanjo, 2020).

For single phase calculation,

$$I = V/R \quad (27)$$

where $V = 240V$, I = current in Ampere (A), R = resistance of the heating element in Ohms (Ω) From equation (27)

Recall power

$$P_s = IV \quad (28)$$

Substituting equation (27) in equation (28)

$$P_s = (V)(V)/R$$

$$R = V^2/P_s$$

Resistance of the heating element, considering 7200W

$$R = (240)(240)/7200 = 8\Omega$$

The current flowing through the system considering 8Ω is

$$I = V/R = 240/8 = 30A$$

For three (3) phase calculation

$$P_s = (I)(V)(PF)(1.732)/1000$$

where, $PF = 1$ = power factor, P_s = power in kW, $V = 415V$

$$I = (P_s)(1000)/(V)(PF)(1.732)$$

using $P_s = 7200W$

$$I = (7.2)(1000)/(415)(1)(1.732) = 10.02A$$

$$R = V/I$$

Considering 10.02A,

$$R = (415)(10.02) = 36.02\Omega$$

RESULTS AND DISCUSSION

Table 1: Pre-heater Design Specification

Mass of kernel, (*kg*)	56
Volume of barrel, (m^3) or 1.2 x $10^8 mm^3$	0.12
Total height of barrel, *h* (*mm*)	580
Diameter of barrel (*mm*)	520
Shaft (stirrer) diameter, (*mm*)	27
Shaft speed, N_s(rpm)	32
Electric motor support (two angle bars of length 480*mm*) (*mm*)	4
Electric motor total power, (*kW*)	0.23
Heater capacity, (*kW*)	7.2
Single phase voltage, (*V*)	240
Single phase current, (*A*)	30
Single phase resistance, ()	83
3 phase voltage, (*V*)	4153
3 phase current, (*A*)	10.023
3 phase resistance, ()	36.02

Insulation thickness (*mm*)40

Heating temperature, (^oC)50

Pre-heater efficiency, (%)97.75

Heating time, t_s (min)13.66

The pre-heater design has a barrel capacity of 0.12m^3, a height of 580mm with diameter of 520mm, shaft diameter of the stirrer being 27mm and a power requirement from a 0.23kW electric motor (Table 1). It was also predicted that the pre-heater heating efficiency was 97.75%, with a heater capacity of 7.2kW and heating time of 13.66 minutes for the temperature of kernel of mass of 56kg to rise to 50^{o}C.

CONCLUSION

The pre heater stirrer shaft diameter for the design was 27mm with power requirement of 0.23kW. The heater capacity was found to be 7.2kW with efficiency of 97.75% and raised the kernel temperature to 50^{o}C in 13.66 minutes. A method of designing for the stirrer shaft torque for sizing its diameter by using the theory of circular motion has also been shown.

REFERENCES

Albayani, A., Mirmanto, M., and Syahrul, S. (2018). Heat Loss from hot Water Flowing in a Copper Pipe Insulated Using Air Enclosed with a PVC Pipe. Dinamika Teknik Mesin, 8,1-7. https://doi.org/10.29303/dtmvi1.137

Demirel, C., Herak, D., and Mizera, C. (2022). Investigation of Optimal Processing Parameters of Palm Kernel Oil Extraction under Uniaxial Loading towards Food Security and Energy Sustainability. IOP Conf. Series: Earth and Environmental Science, 977(2022) 012066. doi:10.1088/1755-1315/977/1/012066

Ezeoha, S.L., Akubuo, C.O., and Ani, A.O. (2012). Proposed Average Values of Some Engineering Properties of Palm Kernels. Nigerian Journal of Technology (NIJOTECH), 31(2), 167-173.

Ezeoha, S.L., Akubuo, C.O., and Odigboh, E.U. (2020). Effect of Some Kernel Factors on Palm Kernel Oil Extraction Using a Screw Press. AgricEngInt: CIGR Journal, 22(1), 156-161.

FAO (n.d). fao.org/3/y4355e/y4355e06.htm

Gbadamosi, L. (2006). Some Engineering Properties of Palm Kernel Seeds (PKS). Journal Agricultural Engineering and Technology, 14, 58-66.

Holman, J.P. (1997). Heat Transfer (8th ed.). McGraw-Hill Inc., USA.

Oyebanjo, I. (2020). Changing Low Voltage Ratings from 240/415V to 230/400V in the NESI – Matters Arising. The Nigerian Power System. https://nigerianpowersystem.wordpress.com/2020/05/26/changing-low-voltage-ratings-from-240-415v-to-230-400v-in-the-nesi-matters-arising

Pohl, C., and Loong, C.K. (2016). In-situ Data Collection for Oil Palm Tree Height Determination Using Synthetic Aperfture Radar. IOP Conf. Series: Earth and Environmental Science, 34(2016) 012027. doi:10.1088/1755-1315/34/1/012027

Ponimin, Suparmi, Sarwanto, and Surnarno, W. (2017). Uniform Circular Motion Concept Attainment Through Circle Share Learning Model Using Real Media. ICSAS IOP Conf. Series: Journal of

Physics: Conf Series 795(2017) 012053. doi:10.1088/1742-6596/795/1/012053

Roy, P. (2021). Approximated Volume of Cone and Sphere from Different Point of View. EPRA International Journal of Multidisciplinary Research, 7(11), 56-65. https://doi.org/10.367313/epra8850

Yener, T., Yener, S.C., and Mutlu. R. (2019). Convection Coefficient Estimation of Still air Using an Infrared Thermometer and Curve-Fitting. Journal of Engineering Technology and Applied Sciences, 4(2), 95-103. doi.10.3091/jetas.598862

Zhou, L., Parhizi, M., and Jain, A. (2021). Temperature Distribution in a Multi-layer Cylinder with Circumferentially-Varying Convective Heat Transfer Boundary Conditions. International Journal of Thermal Sciences, 160(2021) 106673. https://doi.org/10.1016/j.ijthermalsci.2020.106673

DIGITAL LITERACY AND TECHNICAL EDUCATION'S CHALLENGES AND FUTURE DIRECTIONS

BY

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DIGITAL LITERACY AND TECHNICAL EDUCATION'S CHALLENGES AND FUTURE DIRECTIONS

ABSTRACT

This paper discusses the advantages of adopting digital literacy skills in teaching and learning, as well as potential difficulties. It identifies strategies for reducing these difficulties and focuses on the benefits of digital literacy in enabling students to access real-world information. This paper is of the qualitative and opinion kind and is based exclusively on reviews of research journals and publications; no data analysis was performed. However, challenges such as interrupted internet connectivity, inconsistent data transmission, and inadequate teacher and student training may hinder its full adoption. The paper concludes that digital literacy is essential for modern learning, as traditional methods are insufficient and ICTs are crucial for effective teaching. In line with the conclusion drawn above, the paper recommend that the government and other concerned agencies should ensure digital technologies are made available in the right quantities and qualities for teaching and learning in all tertiary institutions.

Keywords: *Digital Literacy, technical education, contemporary challenges, internet connectivity.*

INTRODUCTION

Technology has revolutionized the way people connect, communicate, and work not only that, the way we educate and learn has also changed as a result of technology. The introduction of digital literacy provides both the students and instructors with knowledge and skills they needed to utilize technology responsibly and safely. Digital literacy skills are critical for our educational system. By giving students the resources they need to succeed in an ever-changing digital environment, digital education empowers and educates them. Digital literacy referred to as virtual or electronic learning, has the potential to enhance lifetime learning. It entails learning through multiple technological platforms like computers, the internet, remotely classrooms, or a combination of all the three. To become digitally literate, kids must master technology skills, authorship principles like copyright and plagiarism, how to access online resources, and how to communicate responsibly on social media. Modern pupils are learning in different ways as a result of how seamlessly digital technology has been incorporated into education.

Mastering digital literacy is now crucial for success in school, the workplace, and interpersonal relationships. Therefore, the more technologically savvy faculty members are, the more they will use these talents in the classroom, which is passed on to the students. The Internet and computers are not however, available to all pupils. Those who have access can find solutions to complicated issues in addition to simple ones. Students who do not have access to information or who cannot afford it are severely disadvantaged. Students without access to digital literacy typically use public internet locations like libraries, cafes, or restaurants as a survival tactic.

In order to properly prepare students to be contributing members of society, instructors need to be digitally literate. In order to use a variety of technological instruments effectively, one must be digitally literate (Mantiri *et al.,* 2021). Digital literacy is the capacity to utilize and produce technology-based material, locating and exchanging information, responding to inquiries, communicating with people, and computer programming (Widana,2020). All over the world, technology has become ingrained into personal, professional, and social aspects of our lives.

According to a 2014 report by the U.S. Federal Communications Commission, 31 percent of urban schools and 41 percent of rural schools do not have an internet connection. Students in these institutions struggle to take advantage of the tools, platforms, apps, and resources available to their connected peers, this digital divide is not just in schools, there is also a lack of access to devices and broadband at home exacerbating the digital divide (Udeogalanya, 2021).

On the other hand, companies are seeking digitally literate employees to help them maximize production, create new products, and manage daily business operations. Students need to be well-versed in digital literacy tools and systems management databases to support companies and businesses within our society. Faculty must know how to successfully integrate technology with pedagogy to not only engage students but to ensure students can effectively use digital tools to support the workplace and businesses for centuries to come. Even entrepreneurs use digital literacy to promote and sustain their businesses. Faculty are encouraged to focus on how to improve students' technology skills by increasing student engagement, assessment, and feedback, thus creating effective and meaningful learning environments (Brianna *et al.,* 2019)

According to Uwaifo (2009), technical education is the training of technically oriented personnel who are to be the initiators, facilitators, and implementers of the technological development of a nation. In his opinion, this training of its citizens on the need to be technologically literate would eventually lead to self-reliance and sustainability. He observed that technical education more than any other profession has a direct impact on the development of the country. Again, technical education contributes so much ranging from electrical and electronics technology, metalwork technology, mechanical/automobile technology, building technology, woodwork technology etc, technical education is practical-oriented education which makes it unique in its content and approach thereby demanding special attention.

Unfortunately, despite all the glaring contributions of digital literacy and technical education in our nation, Nigeria is yet to accord this type of education the attention it deserves. This is one of the major reasons for the rising unemployment, poverty, and unrelenting crimes in society today. This paper is an attempt to explore some challenges and the way forward for digital literacy and technical education.

CONCEPT OF DIGITAL LITERACY IN TECHNICAL EDUCATION

The world today has taken a step in literacy, further than mere ability to read and write, and the ability to comprehend a text, to a need to master a new skill called “digital literacy”. Digital literacy according to Lynch (2017) is the ability to find, evaluate, utilize, share, and create information found online…” Similarly, Heitin (2016) reveals that "Digital literacy is the ability to use information and communication technologies to find, evaluate, create, and communicate information requiring both cognitive and technical skills."

According to Ayodele (2018) with digital literacy students can be prepared for a new breed of workplace and a new world. “Digital literacy should be the fourth pillar of a student's education alongside reading, writing, and mathematics and be resourced and taught accordingly.” One essential component of digital literacy when it comes to the field of training is deep learning; of which there are six core skills: Collaboration; Creativity; Critical thinking; Citizenship; Character; and Communication. Educational leadership should ensure that ICTs which are the bedrock of digital literacy are incorporated in these key areas of Training culture: Leadership and Vision: Acquisition of skills needed for planning and developing an ICT strategy, suitable infrastructure, and staff development. This indicator relates to school leadership; Learning and Teaching: Developing motivation, skills, and competencies required for the successful implementation of the ICT strategy for the school (Kaeophanuek *et al.,* 2018).

Digital Literacy Approach towards Minimizing Challenges of Technical Education

ICT can be used as an approach to minimize teaching and learning in the following ways (Nwigbo & Madhu, 2016).

Investigating Reality and Building Knowledge

ICT allows students to investigate more thoroughly the real world. They can access information sources outside the classroom and can use tools to analyze and interpret such information. Information may be accessed through online or through data logging systems. It also makes it easier for individuals to interact and gain expert knowledge in a very short time, thus making the acquisition of knowledge take place easily within a very short period of time (Amalnik *et al.,* 2015).

Increasing Access to Education

The covid-19 pandemic has brought masses together without any physical contact. We also feel that online learning has increased access to existing and new populations. Every nation needs to provide all students easy, free, uninterrupted, and regular access to online learning. Online learning benefits students and professionals by removing time and geographical constraints and increasing access to primary, middle, secondary, and higher education. Online education broadens access to education for an increasing number of students (Barnard-Ashton et al., 2017). All academic institutions have gone online to teach their students, which illustrates extensive online learning growth and its accessibility. Online teaching can create alternative learning experiences where there are limited clinical placement opportunities (Schaffer *et al.,* 2016).

Overcome Physical Disabilities

The variety of input and output devices available provides the opportunity for students who are physically handicapped to be involved in the same learning activities as other students. For some students, computers provide the only environment which they can manipulate and the only tools that reduce their level of disability. Modified keyboards and mouse drivers may be used to allow extremely handicapped students to use regular software packages. For students who are not able to take notes during the course of the class, the system stores in database lessons already taken for further studies and provides a more user-friendly environment for blind students through audio interpretation of the course, thus enhancing their learning (Rusk, 2019).

Way to Put Theory into Practice

Students are required to participate in assessment and evaluation activities to determine their progress on specific topics or syllabi taught during the semester. They require opportunities to participate in online tests, assignments, and projects in order to know their performance in real-time. Students can make appropriate plans for their schedules. Teachers can create questions that cover a variety of topics to help students improve their critical and cognitive skills. A diverse student population can benefit from a variety of online learning activities (Agrawal et al., 2016; Sheringham *et al.,* 2015; Rogo & Portillo, 2014,). The researcher discovered that online collaborative activities typically keep students engaged and create interest in online classes, as well as provide them with opportunities to experience and practice virtual teamwork skills.

Adaptability and Flexibility for Learning

This plays a vital role in every workplace and is similar for teachers and students. The sooner the adaptability, the more flexibility, a prompt increase in learning, and better performance. Adaptability enables students to flexibly handle any change effectively without suffering or stressing out any challenge that may come up. Good relations and free communication with students in online teaching give them autonomy and keep them active and energetic with the teacher and peer group. The adaptability of online learning allows students to maintain a positive working environment, and manage workloads, and study requirements (Davies *et al.,* 2015; Moris *et al.,* 2015). Online learning allows students to work at their own pace and on their own time, to creates a better learning environment, and motivatesthem to collaborate to create knowledge (Rogo & Portillo, 2014)

Developing 21st-Century Skills

The market needs skilled and smart students to work in the global market. Online learning facilitates students to learn independently, plan and take up different tasks, and implement theoretical concepts to

practical ones. The students eventually learn to make decisions on critical problems that come their way. Matlakala *et al.,* (2013) established that student support during online teaching is crucial for motivating them togain confidence and further motivating themto gain knowledge and skills that can assist them in developing effective problem-solving skills.

Encouraging Learning Environment

Every organization requires a positive environment to perform and progress. Similarly, students require a conducive environment to learn and excel. The non-threatening and user-friendly nature of the free and healthy learning environments was praised (Andrew et al., 2015). Teachers, particularly in virtual classes, strive to create a safe and secure learning environment to engage students in discussion and problem-solving activities. They should form strong bonds with the students to allow them to participate in virtual classes by designing interesting and engaging exercises. According to Buckingham (2020), teachers must establish an online presence by cultivating relationships with students by incorporating strategies in teaching.

Increasing Student Positive Attitude and Motivation

The students should be supported and attended to regularly by the teachers to connect and communicate on schedules, plans, topics, study material, curriculum, assessment, etc., to keep them updated and involved in the online process. This boosts their confidence and brings positive feelings to attend classes regularly. We experience that interest and motivation increase with each class. Papillion & Aaron (2017) found that student satisfaction was higher in the online versus the traditional teaching contexts. Once the students get attentive, they intend to learn more to satisfy their demands and increase their subject knowledge to apply in conceptual and problem-solving. Their studies show that increased satisfaction enhances the retention of students and facilitates lifelong learning (Andrew et al., 2015; Tang et al., 2018).

Provide Tools to Increase Student's Productivity

In the past, students have spent a lot of time doing repetitive, low-level tasks, particularly involving writing, drawing, and computation. While it may be necessary for students to develop these skills at some times on most occasions they are pre-requisite to some higher-level tasks. Unnecessary repetition of low-level tasks is inefficient, non-motivational, and obscure in the real purpose of the learning. Many computer applications provide the tools to support students quickly in completing these lower-level tasks so that they can focus on the main purpose of the activity. Packages like word processors, graphics packages, database packages, spreadsheets, and other software that support the performance of the student's knowledge digitally. ICT has transformed teaching and learning processes from being highly teacher-dominated to student-centered, and this transformation has resulted in increased learning gains for students, creating and allowing for opportunities for the learners to develop their creativity, problem-solving abilities, informational reasoning skills, communication skills, and other higher-order thinking skills (Bhaurao, 2015).

Major Challenges of Digital Literacy in Technical Education

We experienced the positive outcomes in the larger context, but it does not define or reflect any constraints of digital literacy in teaching and learning. The challenges are similar and vary for teachers and students in teaching practices and learning contexts. The most significant difficulties that teachers and students encountered while utilizing

digital literacy tools were: interrupted internet connectivity. According to Davies et al., (2015); technical issues and inconsistencies in power supply resulted in unstable internet connectivity, which hampered online teaching and learning, rapidly changing technology, lack of infrastructure and trained manpower, lack of computer literacy, lack of access to computer hinders students from joining online classes, the absence of infrastructure thwarts students from identifying suitable learning resources, and literature for online learning, non-constructive and critical feedback from their peers (Rogo and Portillo, 2014, Telford and Senior, 2017); and concerns for effective and prompt teachers and peers' feedback (Kowalczyk, 2014, Papillion and Aaron, 2017). All these issues and concerns impacted negatively on students learning and the ability of teachers to deliver a high standard of online teaching. These problems increase anxiety; frustration and depression in students resulting in dropping out from the course and creating problems for the family and society at large.

CONCLUSION

Based on the conceptual review above, this paper concluded that learning activities these days are heavily dependent on the use of ICTs since digital literacy is the ability to use ICTs in finding, evaluating, utilizing, sharing, and creating information found online. This research has found that many tutors did encounter some challenges during teaching and learning using traditional classrooms in our institution, faculty where students were forced to use online education to keep the art of teaching and learning up and running especially during covid-19 pandemic, it has not been easy for the students, faculty, staff, administration, families, and the communities, hence the need for instructors and learners to be digitally educated becomes a necessity.

RECOMMENDATIONS

Based on the above conclusion the following suggestions were made

1. Tertiary institutions should adopt the application of ICT to minimize the challenges of teaching and learning in traditional classrooms.
2. There should be adequate funding from the government and other concerned agencies for regular training and re-training of teachers on the ICT approach toward minimizing teaching and learning challenges.
3. Government and other concerned agencies should ensure digital technologies are made available in their right quantities and qualities for the teaching and learning in all tertiary institutions
4. There is a need for regular training and re-training of lecturers to keep abreast with the trends of technology and meet global economic realities. Natural occurrences are inevitable and man must see how to adopt technologies to continue in life despite the challenges of time, place, and distance.

REFERENCES

Agrawal, N, Kumar, S, Balasubramaniam, S.M., Bhargava, S, Sinha, P, Bakshi, B, & Sood, B. (2016). Effectiveness of virtual classroom training in improving the knowledge and key maternal neonatal health skills of general nurse-midwifery students in Bihar, India: *A pre- and post- intervention study. Nurse Education Today, 36, 293-297.*

Amalnik, M. S., Moayyedi, M. K., & Mirzaei, M. (2015). Expert system approach for CAD/CAM integration & optimization based on international standard (STEP) and computer based concurrent engineering. *International Journal of Computers & Technology*, *14*(5), 5695-5706.

Andrew, L, Ewens, B, & Maslin-Prothero, S. (2015). Enhancing the online learning experience using virtual interactive classrooms. *Australian Journal of Advanced Nursing, 32(4), 22*-31.

Ayodele Olafisoye Oloyede (2018). Digital Literacy Assessments in Technical And Vocational Education and Training (TVET) Sustainability: *Conference At: Delta State, Nigeria*

Barnard-Ashton, P., Rothberg, A., & McInerney, P. (2017). The integration of blended learing into an occupational therapy curriculum: A Qualitative Reflection. BMC Medical Education, 17, 1-13

Bhaurao, P. B. (2015). Role of ICT in Indian digital education system. *Indian Streams Research Journal, 5* (2), 1-5.

Brianna, D., Derrian, R., Hunter, H., Kerra, B., & Nancy, C. (2019). Using EdTech to enhance learning. *International Journal of the Whole Child, 4(2), 57–63.*

Buckingham, D. (2020). Epilogue: Rethinking digital literacy: Media education in the age of digital capitalism. *Digital Education Review*, (37), 230-239.

Davies, A.E., Amewonye, F., & Gross J. (2015). The role of distance learning in BSc. Nursing Education. *West African Journal of Nursing, 26 (1), 36-51.*

Dery, S., Vroom F., Godi A., Afagbedzi S., & Dwomoh D. (2016). Knowledge and use of information and communication technology by health sciences students of the University of Ghana. *Ghana Medical Journal, 50 (2), 180-188.*

Furnes M., Kvaal, K.S., & Hoye, S. (2018). Communication in mental health nursing – Bachelor students' appraisal of a blended learning training programme- an exploratory study BMC Nursing, 17 (20), 01-10.

Heitin, L. (2016). Digital literacy: An Evolving Definition. https/www.edweek.org/ew/articles/2016/11/09/what-is-digital-literacy.html (accessed 23 October, 2018.)

Kaeophanuek, S., Na-Songkhla, J., & Nilsook, P. (2018). How to enhance digital literacy skills among. *International Journal of Information and Education Technology*, *8*(4), 292-297.

Kowalczyk, N.K. (2014). Perceived barriers to online education by radiologic sciences educators. *Radiologic Technology, 85 (5) (2014), 486-493.*

Lynch, M. (2017). What is Digital Literacy? https://www.thetechedvocate.org/what-is-digital-literacy/ (Accessed 23 October 2018).

Mantiri, O., Hibbert, G. K., & Jacobs, J. (2019). Digital literacy in ESL classroom. *Universal Journal of Education Research 7*(5), 1301-1305. Retrieved from

Matlakala, M.C., Nkosi, Z.Z., Modiba, L.M., Dolamo, B.L., & Maboe, K.A. (2013). Video conference teaching at an Open Distance Learning (ODL) university in South Africa: Analysis of benefits and drawbacks. AJPHERD, 1, 22-31.

Morris, S., Gurusamy, K. S., Sheringham, J., & Davidson, B. R. (2015). Cost-effectiveness analysis of endoscopic ultrasound versus magnetic resonance cholangiopancreatography in patients with suspected common bile duct stones. *PLoS One*, *10*(3), e0121699.

Nwigbo, S. & Madhu, B. K. (2016). Impact of ICT on the teaching and learning process. *Journal of Mobile Computing and Application 3* (2), 1-7.

Papillion, E., Aaron L. (2017). Student perceptions of online radiologic science courses Radiologic Technology, 88 (4), 366-372.

Rogo, E.J., & Portillo, K.M. (2014). Critical issues in

dental hygiene. *The Journal of Dental Hygiene, 88 (4), 213-228.*

Rusk, F. (2019). Digitally mediated interaction as a resource for co-constructing multilingual identities in classrooms. *Learning, Culture and Social Interaction, 21*, 179–193. https://doi.org/10.1016/ j.lcsi.2019.03.005

Schaffer, M.A., Tiffany, J.M., Kantack, K., & Anderson, L.J.W. (2016). Second life virtual earning in public health nursing. *Journal of Nursing Education, 55 (9), 536-540.*

Tang, B., Coret A., Qureshi, A., Barron, H., Ayala, A.P., & Law, M. (2018). Online lectures in undergraduate medical education: Scoping review. *JMIR Medical Education, 4 (1) 01-11.*

Telford, M., & Senior, E. (2017). Healthcare students' experiences when integrating e-learning and flipped classroom instructional approaches. *British Journal of Nursing, 26 (11), 617-622*

Uwaifo, V.O.(2009), "Technical Education and its Challenges in Nigeria in the 21st Century. *International NGO Journal Vol 5.(2)Pp. 40-44.*

Veronica Udeogalanya (2021). Aligning digital literacy and student academic success: Lessons learned from COVID-19 pandemic. *The Business and Management Review, Volume 12 Number 1*

Widana, I. (2020). The effect of digital literacy on the ability of teachers to develop HOTS-based assessment. *Journal of Physics: Conference Series. 1503. 012045. 10.1088/1742-6596/1503/1/012045*

OBSERVATIONS

1. State the methodology used for this research paper in Abstract
2. Place some of the recommendations in abstract too.
3. Proof read the work again because we have made some adjustments in your ideas.

DIVIDEND POLICY AND MARKET VALUE RELATIONS: EVIDENCE FROM QUOTED FIRMS IN NIGERIA

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ABSTRACT

This study investigated the relationship between dividend policy and firms' market value in Nigeria. The study made use of 20 quoted companies selected from 10 sectors of Nigerian economy from the NSE statistical bulletin and firm's annual reports and accounts for the period of 2015 to 2019. The results of the descriptive statistics found that few numbers of companies are paying high dividends, while the rest companies are paying very low or no dividends. The correlation test revealed that financial institutions are likely to pay high dividends in Nigeria. Also found is the absence of multicollinearity among the variables. The researcher fitted the fixed effect conventional model of panel data analysis and found earnings exerting positive and significant influence on firms' market value, whereas dividend per share and earnings per share insignificantly impacts firms' market value. Likelihood ratio and Haussmann tests rejected the null hypothesis that unobserved variables have no significant relationship with observed variables. The two tests support fixed effect that unobserved variables are important explanatory variable for firms' market value relations. Recommendations were made, amongst which is that firms should improve on their operations by managing their resources effectively and efficiently in order to increase earnings.

Keywords: *Dividend Policy, Market Value, Earnings, Dividend per Share, Earnings per Share*

INTRODUCTION

Dividend policy is a financial decision that determines the amount of the company's earnings to be distributed to shareholders as dividend and the amount to be retained by the company for investment purpose (Pandey, 2001). Surely, retained earnings is the most significant internal source of financing as firms rely on it for the company's expansion. From the shareholders point of view, dividend is considered desirable as they tend to increase their current returns, build their trust in the company and likewise serve as good attraction to other potential investors if the dividend yield and payout ratios are good. Hence, the objective of a dividend policy should be to maximize shareholder's return so that the value of investment is maximized (Pandey,2001).

However, there have been a lot of controversies whether dividend policy impacts market value or share price of a firm. Most researchers have argued

that dividend is irrelevant as they have no influence on the share price, given that the capital markets are perfect (Miller and Modigliani 1961), while some still held that capital markets are not perfect, therefore dividends do matter. This puzzle have remained unsolved, as Okpara (2010) asserted that corporate dividend policy has been a thing of concern to firms at large. They are faced with the dilemma of declaring dividends and making provision for retained earnings so as to make room for more investments and invariably increase the market value of the firm.

Miller and Modigliani (1961), posited that dividend policy is irrelevant and argued that payment of dividend increases the share price of a company and this has the counter effect of reducing the capital gain of the same company, thereby making dividend payment ineffective (irrelevant). Likewise Brennan (1970) and Litzenberger and Ramaswamy (1982), in their tax effect hypothesis, are of the view that if there is no tax for capital gains or if the capital gains is less than the cash dividend tax, investors prefer companies that do not distribute cash dividends and retain profits in the form of undistributed profits. The dividend irrelevant hypothesis was further supported by Black and Scholes (1974) when they submitted that each investor has his/her own implicit calculations regarding preference between high cash dividend benefits or their retention according to the circumstances he/she is experiencing such as the category into which he/she falls and not necessarily dividend.

Lintner (1956) and Fama and Babiak (1968) contended that dividend policy matters (relevant). They asserted that, prevailing earnings and previous dividends determine the dividend payout ratios of companies in developed stock markets. The dividend relevance theorists are of the view that dividend policy remains one of the most important financial policies not only from the viewpoint of the company, but also from that of the shareholders, the consumers, employees, regulatory bodies and the Government. Furthermore, they noted that dividend, is basically the benefit of shareholders in return for their risk and investment is determined by different factors in an organization such as financing limitations, investment chances and choices, firm size, pressure from shareholders and regulatory regimes.

While the argument on whether dividend policy matter, have remained an unsolved puzzle. The irrelevant school; dividend have no influence on the firms' value (Miller and Modigliani 1961) and the relevant school (Walter 1963and Gordon 1959) that dividend policy is relevant on firms' market value. From researcher's point of view, Shareholders desire dividend and managers pay dividends to motivate investors.Every rational investor allocates fund to projects in order to get reward or compensation on the risk and time in the use of capital by the project. That is the minimum acceptable rate or return on funds committed to the projects, because to most shareholders, dividend is the reward or compensation for parting away with their fund and their aim of holding share is to earn dividend. Likewise it is considered that high dividend payout attracts investors; thus dividend policy have a way of influencing the market value of the firm.

This study is born in order to buttress the researchers view in line with the arguments of the theorists and other researchers. Hence the study is to investigate the impact of dividend policy on market value of firms in Nigeria.

REVIEW OF RELATED LITERATURE

CONCEPTUAL REVIEW

Dividend policy is the policy of the firm on how much is retained in the Business. (Oxford Dictionary of Accounting 2005). Dividend are usually decided by the board of directors and paid to the shareholders who are registered on the record date. Dividend payment is justified on the ground that dividends are cash in hand whereas capital gains are cash in the bank (Investopedia, Al-Malkawi, 2007, Al-Malkawi, 2008). But dividends may be in form of property or stock which may be difficult to realize. According to Lee (2019), dividend policy is meant to answer several questions such as; how much dividend should a company pay to shareholders? What will be the impact of dividend policy on the company's market value? What happens if the amount of dividend changes from year to year? Dividend policy centers on decisions that are positive to the firm.

Hence, dividend is one of the most important policies not only to the firm but also to the shareholders, customers, regulatory bodies and the government (Uwuigbe, Jafarm and Ajayi, 2012). Dividend policy therefore concerns a wide clientele that are related to the firm. Broyles (2003) simply defined cash dividends as payments by corporation to its equity shareholders. Broyles further enlightened how corporate boards of directors like paying dividends at a sustainable level, and most believe that shareholders favors steady growth in dividend income. So companies with highly variable earnings tend to pay out lower proportion of earnings to shareholders. More so, firms tends to adopt dividend policies that maximize their values. But Coming up with a dividend policy is challenging because investors prefer both. (Itungia and Kirago, 2012).

Also, market value represents the value of a company according to the stock market. It is a generic term that represents the price an asset will get in the market place.Amollo (2016) defined firm value as financial measure indicating the valuation by the market for the entire firm. It is the total of claims from all the investors that is secured and unsecured creditors and both preferred and common equality holders. In the view of Pandey (2001), market value of an asset or security is the current price at which the asset or security is being sold or bought in the market. Market value per shares is expected to be higher than the book value per share for profitable and growing firm. A number of factors influence the market value per share, and therefore, it shows wide fluctuations. What is important is the long-term trend in the market value per share. In ideal situation, where the capital markets are efficient and in equilibrium, market should be equal to present (or intrinsic) value of a share.(Singh,2010)

THEORETICAL REVIEW

Twotheories were reviewed for study:

DIVIDEND IRRELEVANT THEORY

Modigliani and Miller advocated that dividend policy of a firm is irrelevant, as it does not affect the wealth of the shareholders. Thus, dividends are irrelevant and the value of firm is independent of its dividend policy. The value actually depends on the firm's earnings, which results from its investment policy. Once the investment policy of a firm is formulated, dividend decisions are of no significance in influencing value of firm. Since Miller and Modigliani (1961) developed the irrelevance theory, the controversy of dividend policy has lingered till date. They argued that in a world of perfect capital market where market price cannot be influenced, absence of personal (dividend) and corporate taxes (capital gain) or equal tax rate, fixed investment policy, absence of transaction costs, rationality of investors, there is no relationship between dividend policy and market value. This theory argues that dividends policy does not have significant effect on a firm's value and is therefore irrelevant (Okpara,2012).

DIVIDEND RELEVANCE THEORY

The relevance theory was developed by Walter and Gordon's model. The theory argues that the choice of

dividend policy wholly affects the value of the firm (Walter, 1963). It revealed the importance of the relationship between firm's rate of return and its cost of capital in determining the dividends policy that maximizes the wealth of shareholders. Simply the theory informs that investors prefer higher dividends to lower dividends at any given time assuming dividend level is held constant at every other period. That means, if the dividends per share for each date is held constant, the stock price will rise.

Gordon's model contends that dividend policy of the firm is relevant and the investors put a positive premium on current incomes/dividends. He argues that dividend policy affects the value of shares even in a situation in which the return on investment of a firm is equal to the required/capitalization rate (i.e. r = ke). Walter's model is of the view that the investors are indifferent between dividends and retention.

EMPIRICAL REVIEW

Ordu, Enekwe, Chinedu and Anyanwaokoro (2014) studied the effect of dividend payment on the market prices of shares in Nigeria: A study of 17 quoted firms using time series on dividend per share, dividend yield and dividend payout ratio that ranges between 2000 and 2011. The model specification for the analysis of data is ordinary least squares techniques applied as panel estimation. The results suggests a positive effect between market price per share and dividend per share confirming that a rise in dividend per share brings about an increase in the market price per share of quoted firms; that dividend yield does not have a significant positive effect on the market prices of shares of quoted firms in Nigeria; that there exists a direct relationship between market prices per share and dividend payout ratio of selected firms on the NSE.

Sew, Mohamed and Ahmad (2015) in their study examined the relationship between dividend policy and share price volatility in the Malaysian market. A sample of 319 companies from Kuala Lumpur stock exchange was studies to find the relationship between stock price volatility and dividend policy instruments using regression. Dividend yield and dividend payout were found to be negatively related to share price volatility and were statistically significant. Firm size and share price were negatively related. Positive and statistically significant relationships between earning volatility and long term debt to price volatility were identified as hypothesized. However, there was no significant relationship found between growth in assets and price volatility in the Malaysian market.

Emeni and Ogbulu (2015) examine the relationship between dividend policy and market value of firms in the financial services sector of the Nigerian economy. The study used panel data constructed from the financial statements of firms listed on the NSE for a period of 10 years, from 2002-2011. The ordinary least square (OLS) statistical technique was used for the data analysis. The result of the study shows that , cash dividend, -stock dividend and investment policy have a negative but not significant relationship with the market value of firms in the financial service sector of Nigeria, while earnings was found to have a positive and insignificant relationship with market value (though significant at 10% level of significance).

Oladipo (2015) examined the effect of dividend policy on the market price of share in Nigeria, in so doing, the methodology adopted was person's product movement correlation to evaluate the data collected from the fifteen studied companies. The study revealed among other things that, both internal and external factors affect dividend policy and hence a holistic approach to dividend policy becomes inevitable if a generally acceptable decision is to be taken. On this note, the study recommend inter alias

that policy makers should be well versed in the knowledge of those interactive forces within their environment, which must be considered in order to arrive at a sustainable dividend policy for the generality of the interest parties.

Amollo (2016) aimed to discover the influence of dividend policy on firm value for commercial banks in Nigeria using regression and correlation analysis. The result found a strong positive correlation between dividend payout ratio and firm value among commercial banks in Kenya.

Egbeonu, Edori and Edori, (2016) investigated the effect of dividend policy on the value. The data employed in the study was computed as weighted average of five year summary extracted from the audited financial reports of firms selected at random from Nigeria stock exchange; in performing the analysis, rigorous econometric tools such as unit root stationary test, multiple OLS regression, granger causality test, impulse response innovation and variance decomposition test were all employed. The result of the study revealed that dividend per share is significant and inversely related to share value of the firm while earning per share is both positive and significant to share value of firms.

Budasgaga (2017) examined the impact of dividend payment on the value of firms listed on the Istanbul Stock Exchange. The study has been adapted the residual income approach based on Ohlson's (1995) valuation model. By testing different statistical techniques, fixed effect is applied on panel data for 44 firms listed for the period of 2007 -2015. Inclusive, the findings show a positive significant relationship between dividend payment and the value of firms. The results tend to support agency cost rather than the signaling hypothesis explanation.

Ozuomba and Ezeabasili (2017) examined possible effects of dividend policy on the value of a firm with 10 quoted companies in Nigeria from 1995 to 2015. The study made use multiple regressions on the secondary data (market price per share, earning per share and dividend) as a signaling model and proves that firm value is greatly influenced by dividend policy.

Bamidele, Iko, Lugman and Olawele (2018). This study examines the effect of dividend policy on market value of common stock of firms listed on .the Nigeria Stock Exchange. The study is motivated by unsolved issue on dividend policy in the financial management. Panel data set over the period of 2010 - 2014 was obtained from the audited annual report and daily stock of the selected forms listed in the NSE.The results of the study revealed that payout ratio (POR) has positive effect on stock price, though not significant while earnings per share (EPS) and size has a significant positive relationship with stock price though significant while, market to book value (MBV) has an insignificant positive effect on stock price.

Odum, Odum, Omeziri and Egbunike(2019) evaluated impact of dividend payout ratio on the value of firm with listed firm on the NSE from 2002-2016. The study made use of panel ordinary least square regression techniques. The result of the study revealed that profitability ratio and leverage ratio positively and significantly impact on the value of the firm.

Ejem and Ogbonna (2019) investigated dividend policy and firms' value in Nigeria. This study made use of 24 quoted companies selected from 10 sectors of Nigerian economy from firm's annual reports and accounts for the period of 2012 to 2017. The results of the descriptive statistics found that few numbers of

companies are paying high dividends, while the rest companies are paying very low or no dividends. The researchers fitted the three conventional models of panel data analysis and found earnings exerting positive and significant influence on the firms' value, whereas dividend per share insignificantly impacts firms' value. Likelihood ratio and Hausman tests rejected the null hypothesis that unobserved variables have no significant relationship with observed variables.

MATERIALS AND METHODS

Secondary data of twenty quoted firms from ten sectors of the Nigeria economy for the period 2015 to 2019. The four basic variables in the data involved include earnings, earnings per share, dividend per share and market value. Data for Market value (proxied by total asset/returns on asset), data for earnings (proxied by profit before interest) and data for earnings per share were obtained from the Nigeria stock exchange statistical bulletin while data for dividend per share was got from firms' Annual Reports and Accounting for the periods

The study employed panel data analysis with its variances; pool regression, fixed and random effects. In order to compare the pooled regression model with the fixed effects model the likelihood ratio was used while Haussmann test was used to compare random effect model with the fixed test model. The null hypothesis favors the pooled model i.e. unobserved sectional differences are not significant. Also the null hypothesis favors the random effects model i.e., Z_i are uncorrelated with the explanatory variables.

Model Specification

Functional form;

Market Value = f(dividend policy) (1)

Market Value = f(dividend per share, earnings, earnings per share) (2)

Market value = f(DPS, ENS,EPS) (3)

Explicit form;

Pool regression model approach;

$$MKTVAL_{it} = \alpha_0 + \alpha_1 DPS_{it} + \alpha_2 ENS_{it} + EPS_{it} + \varepsilon_{it} \quad (4)$$

Fixed Effect approach;

$$MKTVAL_{it} = (\alpha + Z_i) + \alpha_1 DPS_{it} + \alpha_2 ENS_{it} + EPS_{it} + \varepsilon_{it} \quad (5)$$

$$= \alpha_i + \alpha_1 DPS_{it} + \alpha_2 ENS_{it} + EPS_{it} + \varepsilon_{it}$$

Random Effect Approach;

$$MKTVAL_{it} = \alpha_0 + \alpha_1 DPS_{it} + \alpha_2 ENS_{it} + EPS_{it} + (Z_i + \varepsilon_{it3}) \quad (7)$$

$$= \alpha_0 + \alpha_1 DPS_{it} + \alpha_2 ENS_{it} + EPS_{it} + \mu_{it} \quad (8)$$

Where, α = Intercept,

MKTVAL = Market value of the firms

DPS = Firms Dividend per share

EPS = Firms earnings per share

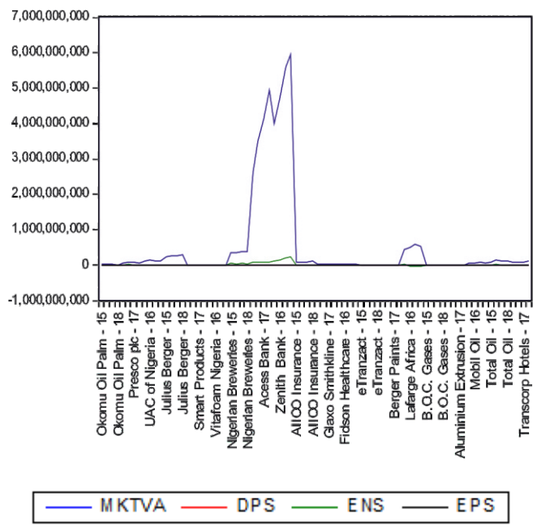
$\varepsilon_{it}, \mu_{it}$ = error terms.

Operational Function (Apriori Expectation)

α_1, α_2>0, <0, are coefficient of DPS and ENS, recognizing both dividend relevance and irrelevance theories. It is expected that earning and DPS will either positively or negatively influence the firms' market value.

RESULTS AND INTERPRETATION

Fig 1 Trend of Data; MKTVAL, DPS, EPS and ENS



The figure1 above shows trend variations in the economy. The figures shows that the financial institutions (sector) outperformed other sectors, followed by building and construction then oil and gas. This shows that though the economy seems to depend so much on oil and gas in reality the financial sector earns more. Also it is discovered that firms generally don't pay cash dividends except financial institutions, this means that the effect of oil and gas is insignificant in Nigeria.

DESCRIPTIVE STATISTICS

Table 1 below shows the description of the variables employed. MKTVAL, ENS, ENS and EPS recorded the following mean 5.34E+08, 209.4625, 18107635 and 293.3000 respectively, while the standard deviations recorded 1.35E+09, 328.3452, 44126904 and 605.3841 respectively. Also, we observed that the variables recorded positive skewness suggesting that the distribution has right tail distribution (ie positive). The Kurtosis are all greater than 3 indicating a leptokurtic distribution. The JarqueBera statistic with its probability values reveals significance at 0.05% level of significance suggesting abnormal distribution.

Table 1: Description of MKTVAL, DPS, EPS and ENS

	MKTVAL	DPS	ENS	EPS
Mean	5.34E+08	209.4625	18107635	293.3000
Median	66181064	59.50000	3143305.	59.50000
Maximum	5.96E+09	1400.000	2.32E+08	2587.000
Minimum	131350.0	0.000000	-34032277	-637.0000
Std. Dev.	1.35E+09	328.3452	44126904	605.3841
Skewness	2.893651	2.110362	3.114428	2.642521
Kurtosis	9.985206	6.787021	13.14531	9.522768
Jarque-Bera	274.2865	107.1868	472.4201	234.9273
Probability	0.000000	0.000000	0.000000	0.000000
Sum	4.27E+10	16757.00	1.45E+09	23464.00
Sum Sq. Dev.	1.45E+20	8517034.	1.54E+17	28952703
Observations	80	80	80	80

Author's computation using E-view 10

Multicolinearity Test

Table 2 below reports correlation using correlation matrix among the variables. The variables ranges from -0.059292 to 0.931896 showing that there is no perfect linear correlation among the variables, hence the researcher has sufficient reason to declare that there is nomulticolinearity in the model.

Table.2: Correlation Matrix for MKTVAL, DPS, EPS and ENS

	MKTVAL	DPS	ENS	EPS
MKTVAL	1.000000	-0.059292	0.931896	0.055785
DPS	-0.059292	1.000000	0.011220	0.278185
ENS	0.931896	0.011220	1.000000	0.151040
EPS	0.055785	0.278185	0.151040	1.000000

Author's computation using E-view 10

Cointegration Test

Table 3: Kao Residual Based Cointegration

Kao Residual Cointegration		
	t-Statistic	Prob.
ADF	-9.292207	0.0000
Residual variance	1.66E+16	
HAC variance	2.16E+16	

Author's computation using E-view 10

Table 3 tested if cointegration relationship exists between dividend policy and firm's value using Kao Residual Cointegration ADF statistics. The table shows that the Kao statistics recorded a coefficient -9.292207 with P-value of 0.0000.This shows rejection of the null hypothesis of no cointegration and it is sufficient to deduce an equilibrium.

The study proceeded to estimating the models with the variances of panel data analysis methods (pool regression, fixed and random effects).

Table 4: Panel Regression Results (Estimation of Models)

Variables	Pool Regression	Fixed Effect	Random Effect
DPS	-204526.4 (0.2382)	-45567.46 (0.6255)	-103050.0(0.2497)
ENS	28.95205 (0.0000)	13.00529 (0.0000)	18.84477(0.0000)
EPS	-163106.2 (0.0881)	-41797.46 (0.4199)	-79657.34(0.1093)
C	1.01E+08 (0.1493)	3.21E+08 (0.0000)	3.12E+08(0.0035)
R-squared	0.878087	0.990937	0.638546
Adjusted R-squared	0.873274	0.986982	0.624278
S.E. of regression	4.82E+08	1.55E+08	1.99E+08
F-statistic	182.4647(0.00000)	250.5544(0.00000)	44.75389 (0.00000)
Durbin Watson	0.465398	2.091327	1.267296

Probability of values are inside bracket

Table 4 above shows the results of the model estimation. The output of both pool regression and random effectwas not discussed because of the presence of autocorrelation, for the pool regression the; Durbin Watson is 0.465 while that of random effect is 1.267, this means that the model is not good enough for policy making hence not reliable. For the fixed effect, it was discovered that ENS has coefficient of 13.00529 with P-value of 0.0000 indicating positive and significant impacts on firm's value, while, DPS and EPS has coefficients with probabilities in bracket of -45567.46 (0.6255), -41797.46 (0.4199), showing that it insignificantly exerts firm's value. Also the constant made a positive and significant entrance into the firm's value.

The model is well fitted at R-Square is 0.990 (99%), with no autocorrelation (Dw 2.091327). Adjusted R-squared coefficient 0.986 implying that dividend policy explains about 98% of the variation in market value in Nigeria. The F-statistic 250.5544 with P value 0.0000 shows overall significance. The researcher therefore conclude that dividend policy variables (DPS, ENS, EPS) jointly have overall significance on the model.

Comparing Pool Regression, Fixed Effects and Random Effect

The researcher moved on with testing if unobserved variables have significant influence on MKTVAL in Nigeria. The acceptance of null hypothesis favors pool regression that states that the unobserved effects are insignificant while rejection of null hypothesis favors fixed effect that the correlation of unobserved and estimated factors are correlated. For the Haussmann, acceptance of null hypothesis favors random effect that correlation between observed and unobserved factors are insignificant. In Tables 5, both the Likelihood and Haussmann tests rejected the null hypothesis that unobserved variables have no significant relationship with observed variables, which would have favored both pool regression and random assertions. Therefore, the two tests favored fixed effect that unobserved variables are important explanatory variable for firm's value.

Table 5: Model specification test

Specification	Statistics	Probability
Likelihood Test	207.924493 (0.00000)	0.0000
Haussmann	48.347233 (0.00000)	0.0000

Table 6: The unobserved firms' cross effects

	COMPANY	SECTOR	EFFECT
1	Okomu Oil Palm	Agriculture	-3.78E+08
2	Prescoplc	Agriculture	-3.98E+08
3	UAC of Nigeria	Conglomerate	-1.89E+08
4	Julius Berger	Construction/Real estate	-1.10E+08
5	Smart Products	Construction/Real Estate	-2.93E+08
6	Vita foam Nigeria	Consumer goods	-2.92E+08
7	Nigerian Breweries	Consumer goods	-6.56E+08
8	Acess Bank Plc	Financial services	1.13E+09
9	Acess Bank	Financial services	2.38E+09
10	Zenith Bank	Financial services	1.40E+09
11	AIICO Insurance	Financial services	-3.03E+08
12	GlaxoSmithKline	Healthcare	-2.84E+08
13	FidsonHelathcare	Healthcare	-2.74E+08
14	Fidson Healthcare	Healthcare	-2.89E+08
15	e-Tranzact	ICT	-2.92E+08
16	Berger Paints	Industrial goods	-2.92E+08
17	Lafarge Africa	Industrial goods	4.42E+08
18	B.O.C. Gases	Natural resources	-3.00E+08
19	Aluminum Extrusion	Natural resources	-2.36E+08
20	Mobil Oil	Oil and gas	-2.04E+08
21	Total Oil	Oil and gas	-2.65E+08
22	Transcorp Hotels	Services	-2.89E+08

Conclusion and Recommendations

This study dividend policy and firms' market value relations employed 22 cross sectional units from firm's annual reports and accounts from 2015 to 2018. It was found that that leverage firms are likely to pay lower dividends in Nigeria. Also, that few numbers of companies especially from the financial sector are paying high dividends, while the rest companies are paying very low or no dividend. These results corroborate the findings of Ordu, Enekwe, Chinedu and Anyanwaokoro (2014), Budasgaga (2017), Ozuomba and Ezeabasili (2017). The results suggests a positive effect between market value and dividend per share confirming that a rise in dividend per share brings about an increase in the market price per share of quoted firms;

The researcher fitted the fixed effect model of panel data analysis and found earnings (ENS) exerting positive and significant influence on the market value, whereas DPS and EPS insignificantly impacts market value. These result corroborates the study of Ejem and Ogbonna (2019) and the postulation of Miller and Modigliani (1961) that the value of the firm is determined solely by the earning power or potentials of the firm's assets or its investment policy and that the manner in which the earning stream is divided between dividends and retained earnings does not affect the firms value iedividend policy is irrelevant to market value, that under a perfect market condition, earnings influences market value which is a function of investment policy.However, it contradicted the findings ofEmeni and Ogbulu (2015) whose findings is an inverse relationship between earnings and market value.Subsequently, the researcher discovered that unobserved variables are important explanatory variable for firm's value (C coefficient 3.210008 and p-value 0.0000). This shows that there are other resources that can impact firms' value if efficiently and effectively employed.

Therefore, the study supports the Miller and Modigliani theory that dividend policy is irrelevant to market value, promoting that dividend policy is irrelevant to market value, promoting earnings as pivotal which exert positive influence on market value, therefore enhancing investment.

In the light of the study the following recommendations are made:

- Given the positive relationship between earnings and market value of firms in Nigeria, investors should take into consideration earnings announcements before taking their investment decision.
- Firms should enhance their operations by managing the resources of firm effectively and efficiently in order to increase earnings.
- Companies operating in the financial services sector of Nigeria should not see dividend policy as a strategy towards increasing their market value.

REFERENCES

Amollo, K.O. (2016), Effects of Dividend Policy on Firm Value for Commercial Banks in Kenya. Research Project Submitted in Partial Fulfillment of the Requirements for the Award of the Degree Nor Master of Business Administration, School of Business, University of Nairobi.

Bamidele, R., Iko, E., Lugman, N. &Olawale, A. (2018), Effect of dividend policy on market value of common stock of firms. *Journal of Economics and Finance,* 14(6), 16-58..

Black, F. (1976) "The Dividend Puzzle". *Journal of Portfolio Management,* 2(3), 5-8.

Black, F. and Scholes, M. (1974). "The Effects of dividend Yield and Dividend Policy on Common Stock Prices and Returns". *Journal of Financial Economics,* 1, 1-22.

Brennan, M. J. (1970). Taxes, Market Valuation and Corporate Financial Policy. *National Tax*

Journal 23, 417-427.

Broyles, J. (2003), *Financial Management and Real Options.* England: John and Sons Ltd.

Budagaga, A. (2017), Dividend payout and its impact on the value of firms listed on Istanbul stock exchange: A residual income approach. *International Journal of Economics and Financial Issues*, 7(2), 370-376.

Egbeonu, O.C., Edori, I. S and Edori D. S. (2016), Effect of Dividend Policy on the Value of Firms (Empirical Study of Quoted Firms in Nigeria Stock Exchange). Research Journal of Finance and Accounting. 7(3),17-25.

Ejem, C.A and Ogbonna, U.G. (2019), Modelling Dividend Policy and Firms' Value Relations in Nigeria. *International Journal of Economics and Financial Issues,* 9(6), 171-176.

Emeni, F. K and Ogbulu, O.M. (2015), The effect of dividend policy on the market value of firm in the financial services sector in Nigeria. *Archives of Business Research,* 3(4), 15-29.

Gabriel, S. (2011), Impact of dividend policy on firm's value. *Journal of Business and economics*, 4(10), 11-31.

Gordon, M.J. (1959), Dividends, Earnings and Stock Prices. *The Review of Economic and Statistic,* 41(2), 99-105.

Gordon, M.J. (1962), The Savings Investment and Valuation of a Corporation. *The Review of Economics and Statistics,* 44, 37-51.

Litzenberger, R. H. and Ramaswamy, K.(1982) The effects of dividends on common stock prices:tax effects or Information effects?. *Journal of Finance* 37, 429-443.

Litzenberger, R. H and Ramaswamy,K. (1979). The effect of Personal Taxes and Dividends on Capital Asset Prices: Theory and Empirical Evidence. *Journal of Financial Economics,* 7(2), 163-195.

Miller, M., Modigliani, F. (1961), Dividend policy, growth and the valuation of shares. *The Journal of Business,* 34, 411-433.

Odum, A.N., Odum, C.G., Omeziri, R.I., Egbunike, C.F. (2019), Impact of Dividend Payout Ratio on the Value of Firm: A study of companies listed on the Nigeria Stock Exchange. *Indonesian Journal of Contemporary Management Research,* 1(1), 25-34.

Okpara, G.C. (2010), A Diagnosis of the Determinant of Dividend Payout Policy in Nigeria: Factor Analysis Approach. *American Journal of Scientific Research,* 57-67.

Okpara, G.C. (2012), *Fundamentals of Corporate Financial Management*. Uyo: Donil Publishing Ltd.

Oladipo, R. (2015), The Effect of Dividend Policy on the Market Price of Share in Nigeria. *Journal of Economics and Finance,* 5(4), 49-62.

Ordu, M., Enekwe, G., Chinedu, O. and Anyanwaokoro, S. (2014), Effect of dividend payment on the market price of share in Nigeria. *Journal of Economics and Finance,* 5(4), 2321-5933.

Ozuomba, C.N., Ezeobasili, V. (2017), Effect of dividend policies on firm value: Evidence from quoted firms in Nigeria. *International Journal of Management Excellence,* 8(2), 956- 967.

Pandey,I.M. (2001), *Financial Management.*(8th edition). New Delhi, India: Vikas Publishing, Pvt Ltd.

Salih, A.A. (2010), The Effect of Dividend Policy on Market Value: Empirical Study Ph.d Dissertation, Durham University, UK.

Sew, E. H., Mohamed, A. and Ahmad, I. I. (2015), Dividend Policy and Share Price Volatility. *Investment Management and Financial Innovations,* 12(1), 88-96.

Singh, S.R. (2010), *Dictionary of Banking.* New Delhi, India: A.P.H Publishing Corporation.

Uwuigbe, U., Jimoh, J. and Ajayi, A.O. (2012), Dividend Policy and Firm Performance Nigeria: A Study of Listed Firms in Nigeria. *Journal Accounting and Management Information Systems*, 11(3), 442–454.

Walter, J.E. (1963), Dividends policy; its influence on the values of the enterprise. *The Journal of Finance,* 18(2), 280-211.

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EFFECT OF 2022 NAIRA REDESIGN POLICY ON THE ECONOMY OF NIGERIA

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ABSTRACT

This paper aims to examine and provide a comprehensive analysis of the effect of the 2022 Naira redesign policy on the Nigerian economy. The Naira has undergone redesigns in the past as a means to enhancing the security features, improve aesthetics, and combat counterfeiting. This study analyzes the potential economic implications of the recent Naira redesign policy and explores its effects on various economic activities, inflation, standard of living of the citizens, trading activities and public perception. It contributes to the understanding of currency redesigns and their potential economic implications, by understanding the consequences of this policy, policymakers and stakeholders can make informed decisions regarding currency redesigns and their potential economic implications. Descriptive statistics was employed in analyzing the data. The primary data were obtained through the use of questionnaires and oral interviews where necessary, secondary data were obtained from research works, journals and newspapers. 276 of the questionnaires were properly filled and returned. Findings revealed that the 2022 cash redesign policy and its implementation led to cash scarcity which affected productive activities, standard of living of the people, Gross Domestic Product and level of inflation in the economy. This study suggests that, successful redesign of Naira hinges on meticulous execution, stakeholders' engagement, and ongoing monitoring to address any emerging issues promptly. This study recommends among others that the Central Bank of Nigeria (CBN) should always try to address the challenges associated with currency redesign with a careful plan, effective communication, and collaboration with the government agencies, financial institutions, and the public.

***Keyword*:** Naira, Redesign, Economy,Scarcity, Policy

INTRODUCTION

The Nigerian currency (Naira) has undergone several redesigns in the past as part of efforts to improve its security features, aesthetics, and functionality. Currency redesigns are typically implemented to enhance the resilience of a nation's currency against counterfeiting, and to align with advancements in printing technology. These redesigns often involve changes in the physical appearance of banknotes and coins, including the incorporation of new security features, updated designs, and the introduction of higher denominations.

Central Bank of Nigeria (CBN), founded in 1958 as the apex monetary authority of Nigeria is responsible with the issue of legal tender currency in Nigeria, maintenance of external reserves to safe guard the value of the currency in international markets, promotion of a sound financial system in Nigeria and acts as the banker of last resort an banker to the government, it provides economicand financial advice to the federal government of Nigeria and it is also the body responsible for the design and production of Nigerian currency.The Nigerian government, through the Central Bank of Nigeria (CBN), has been proactive in implementing currency redesign policies to address counterfeiting concerns and maintain public confidence in the Naira. These redesigns are aimed at improving the security and durability of the currency, as well as promoting efficient cash handling and reducing the cost of currency production. The CBN has also emphasized the importance of incorporating local culture, landmarks, and historical figures in the currency design to reflect the country's heritage. This approach aims to showcase the rich heritage and diversity of Nigeria. By featuring iconic symbols and figures, such as important historical leaders, notable landmarks, or traditional art forms, the redesigned Naira would become a reflection of the country's identity and cultural pride.

The Nigerian Naira was initially introduced in 1973 to replace the Nigerian Pound, and since then, it has undergone a number of redesigns. These redesigns aimed to increase durability, add security features, and add cultural and historical elements from Nigeria. During the pre-colonial era, different tribes used different items such as cowries, manilas, beads, bottles, as a means of exchange. The first major currency introduced in Nigeria was the Shillings and Pence issued as a legal tender currency in British West Africa. The first set of banknotesand coins in Nigeria was issued by the West African Currency Board (WACB), the currency was later changed on 1st July, 1962 to reflect the country republican status. The banknotes bore the inscription “Federation of Nigeria”. the inscription was later changed to 'Federal Republic of Nigeria' inscribed at the top of the naira notes. The Nigerian currency were changed again following the misuse of the banknotes, they were changed from metric to decimal, the name was changed in January, 1973. Naira and kobo was introduced and the major unit of currency which used to be one Pound ceased to exist. The name “naira” was coined from the word Nigeria by Chief Obafemi Awolowo, First Premier of Western Nigeria, one naira was equivalent to ten Shillings and was the major unit in use, while hundred Kobo was equal to one-naira. Twenty naira note (N20) was issued on 11th February, 1977. it was the first in Nigeria to bear the portrait of a prominent citizen of Nigeria, the late Head of State, General Murtala Mohamed (1938-1976) who was the torch bearer of Nigeria's revolution in July, 1975. New currency banknotes of three denominations, namely #1, #5 and #10 were issued on 2nd July, 1979. The colours of all the banknotes in circulation in Nigeria were changed in April 1984, with the exception of the 50Kobo banknote to arrest the currency trafficking prevalent at the time but was later coined in 1991 as well as the

#1 (Pillah, 2023). The engravings at the back of the notes reflected various cultural aspects of the country (The Guardian, 2022). In response to the expansion in economic activities and to facilitate an efficient payments system, the 100, 200, 500 and 1000 banknotes were introduced in December 1999, November 2000, April 2001 and October 2005 respectively (CBN, 2015).There have been discussions about introducing polymer banknotes to replace the traditional paper currency in order to improve durability and reduce counterfeiting. On 28th February, 2007, as part of the economic reforms, #20 was issued for the first time in polymer, The #50, #10 and #5 banknotes as well as the #1 and 50K coins were re-issued in new designs, #2 coin was introduced. On 30th September, 2009 the re-designed #50, #10 and #5 banknotes were converted to polymer substrate following the successful performance of the #20 (polymer) banknotes. Thus, all lower denomination bank notes were now printed in the polymer substrate. Lastly, as part of its contribution towards the celebration and commemoration of the 50th anniversary of Nigeria's Independence and the 100years (the Centenary) of its existence as a country, the CBN issued the #50 polymer banknote on 29th September, 2010 and the #100 banknote on 19th December, 2014 respectively.

The Central Bank of Nigeria (CBN) in 2022, issued a statement that it has concluded plans to redesign the Naira. The CBN Governor cited money hoarding, inflation, and counterfeiting as major reasons for redesigning of the naira. Also, the Naira is not as secured as it ought to be, as it is easier to counterfeit theN500 and N1000 denominations (punchng.com). The Central Bank of Nigeria Governor, Godwin Emefiele observed that over three trillion-naira notes are supposedly in circulation but merely a trillion have been accounted for by the banks. So, the presumption is that the remaining unaccounted couple of trillions are stockpiled somewhere. In line with the provisions of section 2(b), section 18(a) and section 19(a) and (b)of the 1999 Nigerian constitution, the management of the CBN has sought and obtained approval of President of the Nigeria, President Mohammadu Buhari to redesign, produce, release and circulate new series of bank notes ofN200, N500 and N1000 at all levels". He added that, "in line with the approval, they have finalized arrangements for the new currency to begin circulation on December 15, 2022. The new and existing currencies shall remain legal tender and circulate together until January 31, 2023 when the existing currencies shall cease to be legal tender (Tribune, 2022). The major source of concern to the CBN is the rate of insecurity in the country, the increase in scale and sophisticated activities of unscrupulous people on the abuse of the naira, from hoarding to counterfeiting the notes. Emefiele said members of the public were hoarding banknotes "with statistics showing that over 85 per cent of currency in circulation are outside the vaults of our commercial banks, that the apex bank was concerned about the handling of the current series of banknotes and cash in circulation, According to Emefiele, "recent development in photographic technology and advancements in printing devices have made counterfeiting relatively easier. (https://thenationonlineng.net).

The potential redesign of the Nigerian Naira, like any significant policy change, brought about a range of challenges and problems. Some of the key issues that arose in relation to the Naira redesign are; The Cost implications, Redesigning and replacing an entire currency system can be an expensive undertaking. The costs involved in printing and distributing new banknotes, updating security features, and educating the public about the changes can be substantial. It may place a burden on the government's finances and require careful budgeting and resource allocation. According to Sowore (2022), Buhari government claimed to have spent 218billion to redesign the naira, these are the money they could have given to the striking Lecturers to curb hardship and improve the state of the nation's tertiary education sector.

Counterfeiting risks: Counterfeiting is a significant concern for any currency, and a redesign presents an opportunity for counterfeiters to exploit potential vulnerabilities. As the new currency designs were introduced, criminals replicated or counterfeited the new banknotes. There was no robust security features and creation of adequate awareness among the public. NSCDC raised alarm over the increased circulation of fake new naira notes (The Cable, 2023)

Public acceptance and familiarity: People are accustomed to using the existing Naira banknotes. Introducing a new currency design usually cause confusion and resistance among the public, it usually takes a concerted effort to educate citizens about the changes, ensure a smooth transition, and build trust in the new currency. It takes a lot of time to familiarize with the new notes. The redesigned naira notes was easily accepted due to the short period given to the masses between which they have to deposit all old naira notes in their possession with their banks or CBN and then start using the new notes but the new currency were scarce and it caused a lot of chaos and hardship.

Logistics and implementation challenges: The redesign process involves printing and distributing vast quantities of banknotes across the country. Coordinating the logistics of such a large-scale operation was complex. Ensuring an adequate supply of new banknotes to meet the demand of the people and at same time phasing out the old currency in a hurry effectively requires meticulous planning and coordination among various stakeholders, including the central bank, commercial banks, and cash management companies, but the reverse was the case, there was no proper agreement reached among these stakeholders.

Counterfeit detection infrastructure: The successful adoption of a redesigned currency relies on the availability and proper functioning of counterfeit detection equipment, such as banknote scanners and sorting machines. These machines need to be updated or replaced to accommodate the new currency design. Ensuring that such equipment is widely available, easily accessible and functional throughout the country was a logistical challenge.

Cultural and historical considerations: Incorporating elements of Nigerian culture and history in the redesigned Naira is an important objective. However, selecting and representing these elements accurately and inclusively can be a sensitive task. Balancing the representation of various cultural groups, historical figures, and symbols without causing controversy or favoritism requires careful deliberation and engagement with stakeholders. This is the reason the CBN decided to change only the colour of the old notes without changing the pictures.

Maintenance of durability and quality: One of the reasons for considering a redesign is to improve the durability of the currency. It is crucial to ensure that the new banknotes are resistant to wear and tear, so they can remain in circulation for longer periods. Implementing quality control measures during the printing process and educating the public on proper handling and storage of banknotes can help maintain the durability and integrity of the redesigned currency. According to the public, the new naira notes are of poor quality and easily gets dirty than the old notes.

Economic implications: Redesigning the Naira can have economic implications, particularly in terms of the time and effort required for currency conversion and adjustment. It disrupted economic activities, including cash transactions and accounting systems. It lead to additional costs and inefficiencies. Businesses, financial institutions, and government agencies and workers were seriously affected. The

redesign led to scarcity of cash both old and new notes, the newly redesigned notes were hard to get unless by a privileged few. Nigerians faced the reality of cash scarcity. Banks were overwhelmed by angry customers demanding for their money, the ATMs were flooded with furious Nigerians struggling to withdraw cash, many people spent the whole day hoping to get a few Naira notes to carry on with their businesses, pay bills and even buy food. POS operators were not left out in the struggle, for the few cash they were able to get, they charged 20% for every #1,000 withdrawn, therefore, #200 was paid for every #1,000 withdrawn, to withdraw #10,000 a customer pays #2,000 as charge. Most Nigerians were stranded because the bank apps for transfers were having problems and most transferred money were not received on time, in many cases they queue up at the bank customer care sections to rectify these problems. There were chaos and confusion everywhere. the Naira redesign strangulated economic activities and added to citizens' financial pressure by exacerbating the existing excruciating inflationary trends (The Cable, 2023)

Stakeholders: It is worth noting that the redesign of a national currency is a complex and multi-stage process. It involves various stakeholders, including the central bank, government agencies, designers, and experts in currency printing. These entities collaborate to develop a design that meets the desired objectives of security, durability, and cultural representation. However, the reverse was the case, never, in the history of the country's naira redesign, has such exercise brought so much hardship, confusion, apprehension, rancor and despondency, like was witnessed. Disobedience to the order of the Supreme Court and disagreement among the stakeholders, States pitching against the Federal Government, and gradually descending to the masses against the Federal Government, resulting in unimaginable angst leading to the destruction of properties of financial institutions, and even loss of lives.

From the literature reviewed, the redesigning of the Naira is for economic reasons which is not limited to reducing inflation, combating counterfeiting, checking financial insecurity and reducing the money in circulation. The significant hoarding of naira notes outside the banking system is the reason for the inflation spiral, and by reducing the amount of cash in circulation, inflation will fall (CBN, 2023) Other research argued that the policy rids the economy of a lot of 'black money', thereby helping it improve the health of the monetary system which enables the regulators to monitor the flow of funds in the country. In addition, studies contributed that currency redesign can minimize the influence of money on the country's electoral process by discouraging vote-buying and inducing of electoral officers. Currency redesign policies can have significant implications for the overall economy of a country. The introduction of new banknotes and coins affects various sectors, including trade, inflation, investment, and public perception. Therefore, it is crucial to examine the potential effects of the Naira redesign policy on the Nigerian economy to understand its impact on Nigerians and inform future policy decisions. The major objective of the study is to investigate the impact of 2022naira redesign on Nigeria economy, ascertain whether the policy was beneficial to the people and served as a tool to control inflation in the economy.

Naira Redesign and Public Reactions

Currency redesign is an activity of a sovereign nation to either change or modify the existing currency in a country. This can be done for several reasons like; improving the security features of the new currency, reducing the money supply, reducing inflation, investigating incomes from nefarious sources and

many other economic indicators that affect the financial status of a nation (Ndukwe, 2023). The Monetary policy of 2021, focused on easing the impact of shocks on the Nigerian economy which emanated from the various developments in the global and domestic economies (CBN, 2021).Acknowledging that international best practice requires central banks and national authorities to issue new or redesigned currency notes every 5 to 8 years, the President of Nigeria noted that it is now almost 20 years since the last major redesign of the country's local currency was done. This implies that the Naira is long overdue to wear a new look (Premium Times, 2022).Available literature revealed that the CBN always plans to execute the currency redesign to effectively manage the flow of the currencies (CBN, 2015). it also revealed that the 2022 naira redesign and the short period notice was put in place to penalize those hoarding and laundering the Nigerian currency. The purpose of the policy was to mop up the huge amount of cash that was outside the banking system which was estimated to be about 85% of the total cash in circulation and improve the health of the financial system, strengthen security and enable regulators to monitor the flow of funds in the country (CBN, 2022). Currency redesign and cashless policy will help deepen financial inclusion by getting most people into the banking system, improve credit in the system and expand productive activities, as well as usher in an improved cashless policy, and tighten the money supply which may combat inflation (Vanguard, 2022)

This policy elicited serious debate amongst Economists, Lawyers,ministers, governors and other policy experts. Many of them hold the view that this policy change holds no significant economic benefits for the people, and is a distraction in the midst of serious economic crises But, the President has reaffirmed his approval of it. The question is whether this policy is the right policy at this time, considering its costs and benefits (punchng.com). It is agreed that redesigning currencies could curb counterfeiting, especially where the existing design is worn out and its security can be easily bypassed. It is also a fact that, redesigning and printing of new currencies will cost billions of Naira of public funds. (www.thisdaylive.com). currency redesign is a good approach to managing the money in circulation(International Monetary Fund, 2022; Whelan, 2010; Kregel, 2010). according to Peterside (2023) the Naira redesign has strangulated economic activities and added to citizens' financial pressure, the Naira redesign crisis is exacerbating the existing excruciating inflationary trends. The currency redesign policy resulted in unintended consequences and hardship for citizens. During the first quarter of 2023, Nigerians experienced cash circulation shortages due to the naira redesign policy. This policy negatively impacted several informal sector businesses, such as local retail shops, artisans, and commercial bus drivers (Mohammed, 2023). According to Moghalu(2023) Nigeria and Nigerians experienced terrible economic loss as a result of the faulty implementation of the Central Bank of Nigeria's naira redesign policy.

PARADOX OF THRIFT THEORY

This theory was popularized by John Maynard Keynes in the general theory of economics in 1936. the theory considers the negative impact of huge savings in an economy, a paradox occurs when entire population ends up saving almost all the money at their disposal at once. This action leads to falls in cash flow. Businesses run out of circulating capital, this leads to reduced production and distribution, increased unemployment and exposes the economy to danger. 2022 naira redesign policy and it implementation resulted to cash scarcity as a result of the rush by the public to deposit their old currency with the banks within a short period of time, the fall in

cash flow resulted to scarcity of cash to pay bills, make purchases, low consumption level, low output level, increased unemployment and worst economic recession. The Naira redesign crisis is exacerbating the existing excruciating inflationary trends. This may seem paradoxical given that scarcity of cash should have a deflationary tendency instead of an inflationary one (Mohammed, 2023)

METHODOLOGY

Descriptive statistics was employed in analyzing the data, the use of descriptive statistics is as a result of the nature of data obtained. Data were obtained from both primary and secondary sources. The primary data were obtained through the use of questionnaires and oral interviews where necessary, secondary data were obtained from research works, journals and newspapers.

DATA PRESENTATION AND ANALYSIS

300 people drawn from the masses across Anambra state were given questionnaires to fill. 276 of the questionnaires were properly filled and returned while 24 were not returned.

Table 1: Frequency Distribution of Respondents

Categories	Frequency	Percentage (%)
Business men/women	124	45
Civil servants	86	31
Students/politicians	66	24
Total	**276**	**100**

Authors' Field Survey, 2023

From table1, it was discovered that 124 (45%) respondents are business men and women, 86 (31%) are civil servants while 66 (24%) are students and politicians.

Table 2: Sex Distribution of Respondents

Categories	Frequency	Percentage (%)
Male	174	63
Female	102	37
Total	**276**	**100**

Authors' Field Survey, 2023

From Table 2, shows that 174(63%) of the studied population are males while 102 (37%) are females

Table 3: Negative Effect of the 2022 Naira redesign on the respondents' standard of living

Categories	Frequency	Percentage (%)
Very Severe	223	81
Fairly severe	47	17
Not severe	6	2
Total	**276**	**100**

Authors' Field Survey, 2023

Table 3: 81% of the respondents said that the negative impact of the 2022 Naira redesign was very severe on them, 17% said it was fairly severe while 2% said it was not severe.

Table 4: Effect of the 2022 Naira Redesign on Inflation rate

Categories	Frequency	Percentage (%)
Significant Increase	223	81
Not Significant	20	7
Indifferent	33	12
Total	**276**	**100**

Authors' Field Survey, 2023

Table 4, shows that 81% of the respondents were of the opinion that the 2022 naira redesign increased the rate of inflation in the economy, 7% said the impact on inflation rate was not significant while 12% was indifferent.

Table 5: The perceived negative Effect of redesigning the Naira on the Economy are greater than the benefits.

Categories	Frequency	Percentage (%)
Greater	193	70
less	15	5
No benefit	68	25
Total	**276**	**100**

Authors' Field Survey, 2023

Table 5 Shows that 70% of the 276 respondents agreed that the negative impact of the naira redesign on the economy are greater than the benefits, 5% are of the view that the negative impact on the economy are less than the benefits while 25% are of the view that the 2023 naira redesign policy has no benefit.

Table 6: Negative effects of the timing and short transition period of the 2022 naira redesign on economic activities.

Categories	Frequency	Percentage (%)
Very Severe	248	90
Fairly severe	24	9
Not Severe	4	1
Total	**276**	**100**

Authors' Field Survey, 2023

Table 6 indicates that 90% of the respondents agreed that the negative effect of the short transition period of the 2023 naira redesign on economic activities were very severe, 9% said it was fairly severe while 1% said it was not severe.

DISCUSSION OF RESULTS

The results showed that the 2022 cash redesign policy and it attendant cash scarcity affected economic growth and productive activities as there was a decrease in real gross domestic product and increase in inflation level. From the findings in table 3, 81% of the respondents said that the negative impact of the Naira redesign severely affected their standard of living, 17% said it was fairly severe while 2% said it was not severe. This result proves the opinion of some writers on the 2022 naira redesign, according to Peterside(2023) Nigerians were faced with the reality of scarcity of cash, banks were overwhelmed by angry and furious customers demanding money, struggling to withdraw cash, some spend the whole day hoping to get a few Naira notes to pay bills. The newly redesigned notes were rare to get unless by a privileged few. There was confusion everywhere; the pressure this exerted on Nigeria's fragile socio-political and economic conditions was enormous and gradually headed to a tipping point. The currency redesign policy resulted in unintended consequences and hardship for citizens (Mohammed, 2023).

Table 4, shows that 81% of the respondents were of the opinion that the 2022 naira redesign increased the rate of inflation in the economy, 7% said the impact on inflation rate was not significant while 12% was indifferent. Decrease in money supply had been one of the tools government uses in controlling inflation in the economy but the reverse was the case, inflation level increased during the period of the naira redesign and transition. According to Olajide, (2023) despite the claim by the CBN that the significant hoarding of naira notes outside the banking system is the reason for the inflation spiral, and by reducing the amount of cash in circulation, inflation will fall. Unfortunately, inflation did not abate in Q1 2023, inflation remained elevated, driving to new highs in Q1 2023. Peterside (2023) the Naira redesign crisis is exacerbating the existing excruciating inflationary trends. This may seem paradoxical given that scarcity of cash should have a deflationary tendency instead of an inflationary one.The CBN had projected that the naira redesign would reduce inflation. Yet, inflation rose to 22.04 percent in March 2023. That was a 3.2 percent rise compared to when the new notes were introduced in December 2022. Cash scarcity caused negative impacts on food prices and commodities. Food prices

rose by 0.45 percent during the cash crunch between February and March (Mohammed, 2023)

Table 5 Shows that 70% of the 276 respondents agreed that the negative impact of the naira redesign on the economy are greater than the benefits, 5% are of the view that the negative impact on the economy are less than the benefits while 25% are of the view that the 2022 naira redesign policy has no benefits. 70% of the respondents were of the view that the cost implementation and the negative effect of redesigning the Naira was greater than the benefit. Money plays a very important role in every economy, the benefit of the naira redesign was less than the cost, a good cost-benefit analysis includes the social, political costs and benefits and should not only be just about the financial and commercial costs and benefits. According to Ndukwe,(2023) the cost of redesigning the Naira is disproportionate to the expected benefits highlighted by the apex bank. Presently, Nigeria is experiencing a high fiscal deficit, high inflation, high unemployment, underemployment and a slowing GDP. Yemi Kale, former director-general of the National Bureau of Statistics (NBS) estimated that Nigeria lost between N10-15 trillion of national productivity in the first quarter of 2023, as a result of the difficulties created by the naira redesign policy(Moghalu, 2023).

Table 6 indicates that 90% of the respondents agreed that the negative effect of the short transition period of the 2023 naira redesign on economic activities were very severe, 9% said it was fairly severe while 1% said it was not severe. During the first quarter of 2023, Nigerians experienced cash circulation shortages due to the naira redesign policy. This policy negatively impacted several informal sector businesses, such as local retail shops, artisans, and commercial bus drivers. Trading activities for small-scale manufacturers were also affected (Mohammed, 2023). Several analysts have noted that the timing of redesigning the currency was a bad one, especially since Nigeria approached elections in February 2023, and the timeframe was too short to implement such a nationwide policy without witnessing hiccups in the process. Between the period of January and March of 2023, the cash crunch affected economic activities severely as the economy almost came to a halt, due to the inability to access cash for daily economic activities, the shortage of Naira in the first quarter of 2023 had a significant impact on economic activities. As a result of that, real GDP growth for Q1 2023 grew by 2.3%, a drop from its previous year's growth of 3.1%(Q1 2022) and the previous quarter's growth of 3.5% (Q4 2022), (Olajide, 2023)

CONCLUSION

Naira redesign aims at improving security of banknotes, mitigating counterfeiting, preserving the collective national heritage and controlling the volume of money in circulation. Currency redesign assists a country in the fight against corruption, the CBN Said that it decided to redesign some naira notes to eliminate huge volume of counterfeit notes in circulation, money laundering and hiding of the naira notes amongst others. Based on this, the monetary policy of Nigeria was focused on easing the impact of shocks on the Nigerian economy which emanated from various issues concerning the naira and other developments in the global and domestic economies. The objectives of the 2022 naira redesign which were mainly to reduce inflation, combat counterfeits, check financial insecurity and reduce the money in circulation were not achieved after the introduction of the naira notes on December 15, 2022, the economic condition of the people worsened as a result of the shortages of cash in circulation, the new naira notes were counterfeited and exchanged with old notes by fraudsters as there were no adequate measures put in place for detecting the counters, it did not eliminate insecurity in the country rather the increased effect of economic hardship on the people led to increase in insecurity and other crimes in the country.

RECOMMENDATIONS

The Central Bank of Nigeria and other monetary Authorities should understand that the value of a country's currency notes increases only when the wealth of the country increases. A country's wealth is measured in GDP or GNP, therefore the total monetary value of all the goods and services produced within the country at a specified period of time. The more goods and services a country produces, the more wealth the country creates and the more valuable its currency notes becomes. Redesigning the currency or printing more money in a country that engages on more imports than exports will not make a country wealthy or better.

The monetary authorities should first and foremost understand the economic consequences of currency redesign by assessing the effectiveness of such policies in achieving their intended goals and also make informed choices about the timing and implementation strategies, this will help them devise means to solve potential problems and maximize the benefits of currency redesigns for the Nigerian economy.

The effect of the current naira redesign policy showed a need for the CBN to promote monetary policy approaches that complement naira redesign policy and boost free trade in Nigeria; they should improve the cashless policy and its operations for small businesses owners to prevent the impact of cash scarcity on their businesses.

REFERENCES

BusinessDay(2022). *Naira redesign – the law and global best practices*. https://businessday.ng/news/legal-business/article/naira-redesign-the-law-and-globalbest-practices/

Central Bank of Nigeria (2015). History of Nigerian Currency. https://www.cbn.gov.ng/Currency/historycur.asp

Central Bank of Nigeria (2021). *The conduct of monetary policy*. https://www.cbn.gov.ng/MonetaryPolicy/Conduct.asp

Central Bank of Nigeria (2022). Redesigning of the Currency. www.cbn.gov.ng

Central Bank of Nigeria (2022). *Redesign Naira.* https://www.cbn.gov.ng/out/2022/ccd/naira_redesign.pdf

Emefiele G. (2023). Benefits of naira redesign policy https://www.vanguardngr.com/2023/02/benefits-of-naira-redesign-policy-by-emefiele/

International Monetary Fund (2022). Currency crises and monetary policy in an economy.https://www.imf.org/external/pubs/ft/staffp/2000/00-00/ab.pdf

Kregel, J. (2010). An Alternative perspective on global imbalances and international reserve currencies – Economics public policy brief archive. *Levy Economics Institute*.

Moghalu. K. (2023). *Naira Redesign Implementation a Failure and its consequences,* https://www.premiumtimesng.com/opinion/587791-naira-redesign-implemention-failure-and-its-consequences-b, March 15, 2023

Ndukwe.J.(2023).*Naira Redesign and Cashless Policy In Nigeria*, March,2023https://www.researchgate.net/publication/369013173.

Olajide .O. (2023). *The Proposed Naira Redesign, the Ensuing Cash Crunch, and Their Implications on the Nigerian Economy – Evidence from Q1 2023* .https://ssrn.com/abstract=4461208

Olakunle .M. (2023). *How Naira Redesign and its aftermath affects Free Trade in Nigeria.*

https://businessday.ng/opinion/article/how-naira-redesign-and-its-aftermath-affect-free-trade-in-nigeria/Businessday.ng may 10 2023

Premium Times (2022). *Why I approved redesign of naira notes Buhari*. https://www.premiumtimesng.com/news/top-news/566945-why-i-approved-redesignof-naira-notes-buhari.html.

Punch(2023). Emefiele justifies naira redesign, accuses politicians of mop-up https://punchng.com/emefiele-justifies-naira-redesign-accuses-politicians-of-mop-up/

Pillah, T. P. (2023). Implementing Currency Redesign Policy of the Naira in Nigeria: Stratagems for Reaching Economic Steadiness. *Journal of Public Administration, Policy and Governance Research, 1*(1), 49-58.

Pillah, T. P. (2023). *Currency Redesign and Monetary Policy of Nigeria: An Evaluation*. International Journal of Public Administration and Management Research (IJPAMR), *Vol. 8,* No. 4,2023. Available online at http://journals.rcmss.com/index.php/ijpamr. ISSN:2350-2231(E) ISSN: 2346-7215. https://sdbindex.com/Sourceid/00000429, google scholar, etc.

Sowore (2022).

N218Billion Buhari Government Spent To 'Redesign' Naira https://saharareporters.com/2022/11/24/n218billion-buhari-government-spent-redesign-naira-notes-should-have- The Cable (2022*). Nigeria's currency redesign: Cashless policy, and the poor unbanked*.

https://www.thecable.ng/nigerias-currency-redesig-cashless-policy-and-the

Poor unbanked.

Thecable(2023). *The political Dimension of the naira redesign*. https://www.thecable.ng/thepolitical-dimension-of-the-naira-redesign

The Cable(2023).

The back and forth with naira redesign policy. https://www.thecable.ng/timeline-from-old-notes-to-old-notes-the-back-and-forth-with-naira-redesign-policy

The Cable(2023). We have no plans to extend Feb 10 deadline for old naira https://www.thecable.ng/just-in-we-have-no-plans-to-extend-feb-10-deadline-for-old-nairanotes-says-cbn

The Guardian (2022).*The History of currency introduction and redesign in Nigeria*. https://guardian.ng/opinion/the-history-of-currency-introduction-and-redesign-innigeria/

The Nation (2022) *Naira Redesign: Any implication for the Economy*. https://thenationonlineng.net/naira-redesign-any-implications-for-the-economy/

ThePunch(2022).*Redesign and redistribution of Nigerian currency*.https://punchng.com/redesign-and-redistribution-of-nigerian-currency/

Tribune (2023).

Naira redesign drama and citizens' needless frustrations https://tribuneonlineng.com/naira-redesign-drama-and-citizens-needless-frustrations/

Thisdaylive(2023).

Naira Redesign: Amid Twists and Turns, Emefiele . https://www.thisdaylive.com/index.php/2023/02/05/naira-redesign-amid-twists-and-turns emefiele-maintains-course

This day live(2023).

The Politics of Naira Redesign and Its Attendant Implications https://www.thisdaylive.com/index.php/2023/02/21/the-politics-of-naira-redesign-and-its-attendant-implications

This day live(2023).Waiting for Banks' Compliance with CBN Directives on New Naira Notes https://www.thisdaylive.com/index.php/2023/01/15/waiting-for-banks-compliance-with-cbndirectives-on-new-naira-notes

Vanguard (2022). *4 reasons CBN redesigned naira* notes.https://www.vanguardngr.com/2022/11/4-reasons-cbn-redesigned-nairanotes/#:~:text=The%20Governor%20of%20the%20Central,Thursday%2C%20Decemb er%2015%2C%202022.

Whelan. K. (2010). Global imbalances and the financial crisis. Paper for the European Parliament's Committee on Economic and Monetary Affairs.