EXPERIMENTAL INVESTIGATION INTO THE FACTORS THAT INFLUENCE LIQUID PHASE DENSITY (LPD) OF GAS SATURATED CRUDE OIL SYSTEM AT RESERVOIR CONDITIONS

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Abstract
The trend on liquid phase density under the prevailing reservoir pressure at constant temperature of 154^0F, and the factors that affect liquid phase density have been investigated experimentally by Pressure-Volume - Temperature (PVT) analysis on a Bottom Hole Crude Oil sample. A High pressure and temperature Ruska black oil Cell was prepared and its volume was calibrated in the ranges between 73^0F & 250^0F and 15 Psia to 6000 Psia to determine a cell volume equation of the form; V(P,T) = 515.214 + T + P + PT where, T, and P are temperature and pressure coefficients for the cell volume equation under temperature and pressure. For this study, = 8.80 x 10^{-3}, = 8.89 x 10^{-5} and = 2.30 x 10^{-8} respectively. 78.6631g (100.310cm^3) portion of a bottom hole crude oil sample with an ID No. Ohaji South, well No. 3. DST# I was transferred into the high pressure Cell at 5000 Psia and laboratory room temperature of 73^0F (23^0C) in single homogeneous phase. The Cell was heated in a thermostat Silicone Oil Bath maintained at a constant temperature cycle of (154±2)^{0}F throughout the study. The crude oil sample was subjected to pressure depletion in two stages viz; Constant Composition Expansion and Differential Liberation Expansion at 154^0F. During Constant Composition Expansion, density decreases from Pressure of 5000 Psia to a minimum at the bubble point pressure of 2870 Psia. At Differential Liberation Expansion below the bubble point pressure, the liquid phase density increased gradually and monotonically down to atmospheric (abandonment) pressure absolute. It was observed that, the gradual and steady increase in the liquid phase density was as a result of the liberation of solution gas in the liquid phase causing shrinkage of liquid phase volume. The enrichment of the heavy (C7+) fractions in the liquid phase as pressure declined with evolution of solution gases also enhanced the increase in the liquid phase density at 154^0F. It was also observed from the Chromatographic analysis that, the heavy fractions (C7+) in the vapor phase increased with decrease in Pressure. There was also increase in the specific gravity of liberated Solution gases with decreasing pressure. All these factors affected the liquid phase density tremendously.

Key Words: Liquid phase density, gas gravity, bottom hole sample.

1.0 Introduction

The importance of oil density data cannot be over emphasized in that oil and gas process/production Engineers rely on accurate oil density data to determine amongst others, flow characteristics, design process equipment that would produce oil well fluids from reservoir to surface conditions, estimate oil reserve, perform materials balance evaluation etc.

The properties of oil well fluids change with the volumetric changes of the fluid system due to changes in reservoir pressure and temperature as fluid is produced to surface facilities. In most petroleum reservoirs, change in temperature along oil column may be insignificant as to be ignored, although some reservoirs have thermal gradients and periodic temperature gradient survey is conducted to establish predictable temperature gradient log.

Crude oil density depends on quite a number of factors such as gas solubility, gas gravity, composition, temperature, pressure and shrinkage factor (oil formation volume factor). Understanding how these factors influence crude oil density is so vital in that, many Scholars/Researchers have employed these factors to model crude oil density correlations with reasonable error tolerance comparable with laboratory measured data.

Madrazo, Hanson and Witte showed liquid phase density dependence on pressure and temperature by presenting a reservoir fluid density pressure temperature correlation.

Standing (1981) studied the effects of Natural gas on liquid phase density which led to the introduction of pseudo-liquid density in his correlation of liquid phase density as a function of solution gas oil ratio formation volume factor amongst other fluid properties.

One major factor that affects crude oil density is the overall composition and chemistry of crude oil system. The nature of hydrocarbon fractions such as

the SARA fractions also has a great influence on the density of crude oil. The higher the heavy fractions in crude oil, the higher the density and vice versa.

Liquid phase density is a property that indicates the quality of a petroleum and its products. It is also a very useful property to estimate other fluid properties such as surface tension, viscosity of petroleum (M. R. Raizi et. Al 2001). Thus, petroleum fluids density depends on the characteristic nature of fluid and geographic region, molecular compositions and several other properties. Density is a property that indicates the quality of a petroleum and its products. It is also a very useful property to estimate other physical properties such as surface tension, viscosity of petroleum fluids (Riazi et. al, 1987). Petroleum fluids density evaluation required proper information of the characteristic nature, molecular compositions and properties of petroleum fluids in the reservoirs.

2.0 CONCEPTUAL REVIEW OF LITERATURE

2.1 Factors Affecting Densities of Petroleum Fluid Mixtures

2.1.1. Effect of Temperature and Pressure on petroleum reservoir fluid mixtures

The effect of temperature on the density of petroleum reservoir fluids has been studied extensively by Scholars (De-hua and Jiajin Liu,2010; Witte (1987). Density of petroleum fluid mixture decreases as temperature increases on account of volume expansion. The simple relation to account for volume expansion is the coefficient of isobaric thermal expansion of fluids given as state in Equation (1)

; ……equ (1)

…… equ(2)

Where α is the coefficient of thermal expansion at constant pressure, ρ_T is the fluid density at temperature T, ΔT is the change in temperature, V_0 and ρ_0 are the fluid volume and density at the reference temperature respectively.

Increase in temperature also enhances more natural gas molecules to dissolve in crude oil as volume expansion creates more vacant space for inclusion of more gas molecules thus causes the reduction of density of petroleum fluids as temperature increases.

The coefficient of isothermal compressibility of fluid is given by;

……equ (3)

…….. equ(4)

Gases generally respond to a large change in volume if there is a small change in pressure which also greatly causes a change in density. Liquid also responds to change in volume when there is a change in pressure but not as much as for gaseous system, density also changes. Petroleum fluid densities generally increase with increase in pressure at constant temperature. At higher pressures, fluid volume is compressed causing a decrease in fluid volume leading to increase in density of the fluid at higher pressure. From McCain W.D., Jr (1990), and standing M.B. (1977) for $P>P_b$, the fluid density can be expressed in terms of fluid pressure and compressibility as;

…….. equ(5)

Where, ρ_0= density at pressure above bubble point, P_b is the bubble point pressure.

C_0= is the coefficient of isothermal compressibility in the range of pressure P_b to P ($P_b \leq C_0 \leq P$) and ρ_b is the density at pressure P_b.

Lee *et al*. (1966) presented density data for mixture of methane and n – decane. Knapstad *et al* (1990) also measured the liquid density for this mixture at four different methane compositions in the temperature range 20-150^{0}C and at pressures up to 40 MPa. Canet *et al* (2002) compared the Knapstad *et al*. (1990) and Lee *et al*. (1966) data and observed a significant difference between their results, possibly because they were obtained at different conditions. To fill this gap in the data, they measured monophasic (single phase) liquid densities for binary mixtures of methane with decane at high pressures (up to 140 MPa) and in the temperature range 293. 15 to 373.15 K. They showed that for each composition, the density increases with pressure, (figure 2 – 3), and decreases with temperature. The behavior was the same as would be expected for a mixture of two liquid components. Audonnet and Padua (2009) also measured the density of methane from 303 to 393 K and pressure up to 75 MPa.

They correlated their results with the Tait equation, which will be explained earlier.

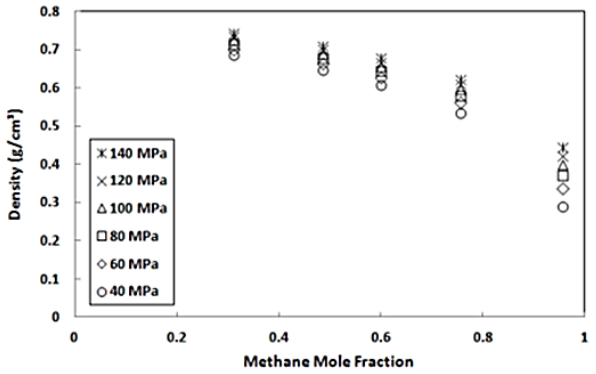


Figure 1 Variation of the density with composition at 333.15 K versus different pressures. (data adapted from Canet *et al* (2002)).

Tait (1888) also showed a fluid pressure - density relation in his original equation as Expressed in the equations below;

……equ (6)

2.1.2. Effect of Molecular Composition of Petroleum Fluids on Density.

The effective density of petroleum fluid mixture depends on the compositions of the molecular species that make up the hydrocarbon system. M.R. Riazietal (2001) correlated the molecular properties of liquid petroleum with densities and molar refractive indices show that molecular composition of crude oil and its fractions contribute to the overall density of the petroleum fluid. Different crude oils with different compositions have different molecular weights and densities respectively. Petroleum fluid with higher density is an indication that it contains higher percentage of the heavy fractions and vice versa.

Table 1: Relationship between densities of different of types of petroleum fluids and chemical compositions in the C_{7+} fractions Heptanes plus fractions. (M., R. Riazi et al. 2001.)

Type of Petroleum Fluid	^{0}API	Mole% of C_{7+} Fractions	Molwt	Density g/cc
Wet gas	65	0.82	132	0.7500
Gas Condensate	48.5	8.21	184	0.8160
Near Critical Oil	44.9	9.873	192.8	0.8030
Volatile Oil	36.7	22.57	240	0.8640
Black Oil	23.6	56.40	274	0.9200
Dry Gas	-	-	-	-

2.1.3. Effect of solution gas in the density of petroleum fluid.

The effect of dissolved gas in petroleum fluids has been studied (standing- Katz et al., 1997 and Tharanivasanetal, 2011). The concept of pseudo liquid densities was introduced by Standing-Katz (1942) to describe how a gas dissolved in liquid at standard conditions and behaves as liquid. The density of liquid containing dissolved gases at high pressure increases as more gases are compressed into the liquid phase (De-hua- Han et al., 2011). However, as pressure decreases, fluid volume expansion causes density to decrease. Petroleum liquid saturated with gas decreases with increasing gas solubility at a given temperature and pressure (Standing, M.B.,1977; John, M. Campbell et al. (2014).

John M. Campbell et al (2014) conducted a simulation study on the effect of dissolved gas on the density of crude oil gathering flow lines. Their studies showed that, crude oil density decreases with increasing solution gas or gas solubility.

The effect of presence of Non-hydrocarbon gases such as carbon dioxide on crude oil mixture in reservoir has been reported by Lansangan and Smith (1993), Deruiter et al (1994) Grigg (1995) and Ashcroft and Ben-Isa (1997). Lansangan et al (1993) discovered that, mixtures of carbon dioxide in a west Texas crude oil showed a monotonic increase in the density with increasing concentration of carbondioxide.

Table 2 Measured density and viscosity versus CO_2 composition in CO_2/Oil mixtures (Lansangan and Smith 1993).

Composition of CO_2(mole %)	Measured density (g/cm^3)
0.022	0.7440
0.034	0.7450
0.1506	0.7490
0.3498	0.7610
0.5482	0.7820

3.0 MATERIALS AND METHOD

3.1 Description of Materials Equipment and Method

This paper described the experimental method used for measuring the liquid phase properties on which density depends. The materials and equipment are described and the experimental procedure were outlined as follows.

3.1.1 Materials

Materials used for the experiment include, normal Hexane, Acetone and Toluene, all are technical grade solvents used for cleaning of equipment, compressed air, Helium gas, liquid Nitrogen, Standard analytical grade gas for GC analysis, mercury as displacement/pressuring fluid and crude oil sample obtained from RFL Laboratories, with sample ID No: Ohaji South, Well No3, DST No1.

3.1.2 Equipment

Equipment used for the study include:

- High pressure and high temperature Ruska blind cell with top and bottom needle valves, the was installed in Silicone oil bath with thermostat to maintain steady temperature.
- Sargent Welch Vacuum pump.
- Positive displacement Ruska Mercury pump equipped with pressure manifold with precision pressure gauges (analog and digital).
- Mettler precision analytical balance.
- Technical balance.
- High pressure density cell (20ml capacity)
- Ruska gasometer (4,000cc capacity)
- Fortain Barometer.
- Motorized Mercury pump.
- J-type digital thermocouple with probe.
- High pressure tubing/liners.
- 500 series SHIMADZU TCD digital gas chromatograph.
- Personal desktop computer for PV/DV data reduction and analysis.
- Adjustable Spanner.
- 100ml Separator flask.
- Transparent Nylon/PVC tubing for gas line connections.

3.1.2.1. Mercury Pump and Pressure Gauge

Pressure and Volume control of the system and sample transfer were achieved by hand operated Ruska mercury pump previously calibrated for pump correction factor of 0.9997.

3.1.2.2 Constant temperature silicone oil bath

The blind cell was kept in the constant temperature silicone oil bath with internal insulation. The oil bath is equipped with manual/electrical rocker cam driver mechanism as a means of rocking the cell. Constant temperature was maintained by a thermostat with 500watt heater and electrically driven stirrer to ensure uniform equilibrium temperature. The temperature in the oil bath was controlled within ±2^{o}F. To check the temperature of the heating oil bath at all times, a type J-digital thermocouple is inserted into the heating oil at different points and compared with the reading at the thermowell point drilled on the blind cell. The same reading was maintained at all times throughout the experiment. The silicone oil used as the medium for heating the cell is thermally stable up to 300 – 500^{o}C which is far above the study temperature of just 67.78^{o}C (154^{o}F).

3.1.2.3 High Pressure Cell (Blind Cell for Black Oil Study)

A blind cell with capacity 515cm^3 was used for the study. It was fabricated by Ruska instrument corporation. The blind cell is placed inside a constant temperature silicone oil bath with a stand/mechanism on which it could be rocked back and forth freely inside the oil bath. The blind cell was designed to withstand a tested pressure and temperature of 12,000Psia and 350^{o}F respectively.

3.1.2.4 High Pressure and Temperature Ruska Blind Cell Volume Calibration.

3.1.2.4. PVT cell preparation for calibration.

The cell was cleaned with normal hexane solvent and Acetone solvent and placed on high Vacuum for 6 – 8 hours. The cell volume was Ruska cell preparation for volume calibration of the high

pressure and temperature. PVT blind cell in an oil bath was cleaned with n-hexane and acetone and evacuated at high vacuum for 8 hours.

The cell volume was calibrated at temperature and pressure range of 73^0F to 250^0F and 1 atmospheric pressure to 6000psia. Pump and temperature reading were ploted to obtain V –T chart and V – P isotherm charts, from where the cell volume equation would be determined as follows:

Vcell = 515.214 + T + PT + P

Where + and are Temperature and pressure coefficients obtained from the calibration curves. For this work = 8.80 x 10^{-3}, = 8.89 x 10^{-5} and = 2.30 x 10^{-8}.

3.2 Description of experiment

78.6631g of the crude oil sample was transferred into the high pressure Cell at 5000 psia and 23 degree centigrade laboratory room temperature in single homogeneous phase. The fluid sample was heated up to the study temperature and subjected it to pressure depletion in two stages viz; constant composition expansion and differential liberation expansion at 154^0F. Constant composition expansion was conducted where the fluid bubble point Pressure was determined to be 2870 psia. Differential vaporization expansion was conducted below the bubble point Pressure to evaluate the liquid and gas phase properties which affect the liquid phase density of the crude oil mixture at the prevailing conditions of reservoir.

The experimental results are shown in tables 3 and 4 respectively.

4.0 EXPERIMENTAL RESULTS AND DISCUSSIONS

Table 4: The effects of solubility and CO2 Concentration on the liquid phase densities of the fluid sample at pressure and 154ºF.

Pressure (Psia)	Concentration of CO_2 (Mole %)	Liquid phase density (g/cm^3)	Volume of Gas in liquid phase at standard conditions (cm^3)	Volume of Gas at Cell conditions (cm^3)
+2870	-	0.7369	8349	-
2300	0.950	0.7520	6631	10.891
1800	0.990	0.7630	5179	11.823
1300	1.060	0.7741	3773	16.196
800	1.280	0.7858	2395	26.417
300	1.490	0.7977	1023	70.581
100	1.940	0.8033	443	85.060
15	2.420	0.8152	0	

+Bubble point pressure.

Standard Conditions are; (60ºF or 15ºC, 14.7Psia)

4.2.0 DISCUSSION OF EXPERIMENTAL RESULTS

4.2.1 The effects of pressure on the liquid phase density of the crude oil sample at 154^0F

The variation of liquid phase density with pressure at 154^0F is presented in table 4.1 and 4.2. The observed trend on the liquid phase density with fluid system pressure at the prevailing temperature was that, liquid phase density increased with increase in pressure above the bubble point pressure. Below the bubble point pressure, during pressure depletion (differential liberation process), gas evolving from the liquid phase was continuously removed causing the volume of liquid to shrink or decrease. This resulted in the progressive increase in the liquid phase density as pressure decrease towards atmospheric pressure. The minimum liquid phase density occurred at the bubble point pressure corresponds to 0.7369 g/cm^3 at the bubble point pressure of 2870 psia respectively. This was as a result of maximum gas saturation in the liquid phase.

4.2.2 The effects of gas solubility and co_2 concentration on the liquid phased density at 154ºF and pressure.

It was observed that, the liquid phase density was affected by the C02 concentration and gas solubility in the liquid phase. The liquid phase densities of the fluid sample decrease with increasing solubility of gas in liquid phase. The gas volume in solution was the maximum at the bubble point pressure with the

corresponding liquid phase density being the minimum, see Table 4.1.

The CO_2 concentration increases with decreasing pressure. Increasing concentration of CO_2 in the oil phase also caused the density of the liquid phase to increase. One of the observed trends in this study was that, increasing $C0_2$ concentration in the liquid phase causes a corresponding increase in the liquid phase densities. This observation when compared with literature followed the same trend as reported by (Lansangan, 1993; Ashcroft and. Isa, 1997). Lansangan and Smith suggested that, the increase in liquid phase density of crude oil system might be caused by strong intermolecular columbic interactions between $C0_2$ and hydrocarbon molecules.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The various factors affecting liquid phase density has been investigated experimentally through pressure volume temperature (PVT) analysis of bottom hole crude oil sample. Experimental study revealed that, temperature, pressure, gas solubility, CO_2 concentration among other factors greatly affect the density of the crude oil sample under prevailing reservoir conditions. This work would serve as a case study in Niger Delta Crude Oil System.

5.0 **Recommendations**

The following recommendations are made for further improvement

* The Heptanes plus (C7+) fractions should be characterized using extended analysis techniques.
* Bubble point Pressure visual tracker real time high speed Camera be installed so as to reduce the uncertainty in the measurement of bubble point pressure, bubble point volume and the specific volume.
* Attainment of equilibrium between the liquid and gas phase is usually very slow during constant composition expansion process. Poor agitation/rocking of the cell will result to poor equilibrium of the two phase. This will cause serious error in the P-V measurements. Thus, Window/Condensate cell with auto rocker cam driven mechanism should be used.
* For crude oil containing high brine/ water content, Mercury free floating piston High pressure Cell should be used in place of the blind Cell. This will eliminate the possibility of formation of water- oil- Mercury emulsion.

*** The experimental data from this study should be applied in the Oil and Gas industry PVT simulation package for black oil Modeling and reservoir Engineering applications.**

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LA VIOLENCE MEURTRIER CONTRE L'ENFANT: UNE ETUDE DE BRAH LA VILLAGEIOSE DE REGINA YAOU

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Resume

La thématique de violence est l'une qui a continué à se produire dans la fiction en général, plus encore dans la fiction africaine. De l'époque coloniale jusqu'à ce jour, la violence semble être devenue un terme familier en Afrique, surtout la violence meurtrière contre les enfants. Cela a pris une dimension nouvelle et sérieuse au cours des dernières décennies. De la narration de contes oraux ou de fées où des personnages comme les orphelins et les enfants deviennent victimes de créatures brutales habilitées par des forces surnaturelles, à la fiction d'aujourd'hui dans laquelle les personnages pourraient utiliser leurs positions, leurs pouvoirs et même leurs idéologies etc. pour opprimer ou réprimer les autres. Notant que l'enfant est l'avenir de la société, ce travail, (la violence meurtrière contre l'enfant ; étude critique de Brah la villageoise de Régina Yaou) révèles la naïveté de l'enfant et expose des violences meurtrières contre l'enfant comme la violence physique, la violence psychologique etc dans la société contemporaine. En effectuant ce travail, la théorie sociocritique a été utilisé qui rendre le travail plus explicatif et d'autre travaux connexes ont été consultes.

Mots clés: violence, enfant, meurtrière, sociocritique.

INTRODUCTION

La fiction pourrait être considérée comme un outil à travers lequel la violence est affichée. La violence provient parfois de forces antagonistes, ou peut aussi être auto-infligée, directement ou indirectement. Néanmoins, quelle que soit la source, la violence provoque des réactions différentes de la part de personnages différents. Certains personnages peuvent être conditionnés à ne pas s'éloigner du lieu d'oppression comme dans le cas de Brah dans *Brah la villageoise*. Ce sont, par exemple, les victimes de violence domestique. D'après les Nation Unies (2006), La violence contre des enfants touche plus d'un million d'enfants et coûte aux économies mondiales 7 milliards de dollars par ans. En 2015, les dirigeants mondiaux ont classé la violence contre des enfants parmi les principales priorités du Programme de développement durable à l'horizon 2030**.** Sans doute**,** Ce travail, contribuerai à cet objectif mondial.

Selon une étude réalisée par les Nations Unies sur la violence contre des enfants (2006), elle tire sa définition de la violence de l'article 19 de la Convention relative aux droits de l'enfant comme suit : « toutes les formes de violence physique ou mentale, d'atteinte et de sévices, de négligence de mauvais traitements ou d'exploitation, y compris les sévices sexuels ». Elle inclut également la définition de l'Organisation mondiale de la santé dans le Rapport mondial sur la violence et la santé (2002). La violence c'est l'usage intentionnel de la force physique ou du pouvoir, de la menace ou de la réalité, contre un enfant, par un individu ou un groupe, qui entraîne ou a une forte probabilité d'entraîner un préjudice réel ou potentiel à la santé de l'enfant., la survie, le développement ou la dignité. Ces trois mots dans la définition de violence contre l'enfant sont importants.

Selon le dictionnaire *Le petit Larousse* (2019), la violence est caractère de ce qui se manifeste, se produit ses effets avec une force intense, extrême, brutale. C'est la force brutale des êtres animés ou des choses. La violence c'est aussi la contrainte exercée sur une personne par la force ou l'intimidation. A travers ces définitions que nous avons proposé on pour voir que la violence est ce qui a l'évidence, caractérise la violence, et la manifestation de la force intense, l'abus de cette force donc la brutalité. C'est l'usage à outrance de la force, un abus contre la volonté. La force brutale peut s'appliquer à un choc avec des effets destructeurs, aux sentiments violents, aux émotions passionnelles. La violence caractérise l'être qui exerce une action brutale comme le résultat de cette action sur l'individu qui la reçoit.

La violence peut être commise par n'importe qui. Elle pourrait être commise par un individu comme Nimba selon l'œuvre choisi, un État ou un groupe ainsi qu'une organisation, à travers leurs membres et même à travers leurs politiques**.** Par exemple, Pendant la colonisation, l'enfant a suffert Toundi dans *une vie de boy* de Ferdinand Oyono (1956) qui

était maltraité par les colonisateurs et meurt suivant un vol commis par sa camarade Sophie. On rappelle des expériences horrifiques de Meka et ses deux fils dans *Le Vieux Negre et la Médaille* de Ferdinand Oyono (1956). Les enfants dans *Les Bouts de bois de Dieu* de Sembene Ousmane (1960) ont été laissés à souffrir et mourir de faim. On peut voir beaucoup d'atrocités contre l'enfant partout jusqu' aujourd'hui dans la société. Beaucoup à la main des colonisateurs. Cela pourrait créer de la peur ou des blessures réelles et peut également interférer avec la liberté personnelle de ceux-ci. Régina Yaou, et plusieurs écrivains africaine condamnent la violence contre l'enfant et montrent que la protection de l'enfant contre la violence est nécessaire pour l'avenir de la société. La société africaine est marquée par beaucoup des actes négatifs comme le suicide, les meurtres etc. Ceux qui commet la violence contre l'enfant, font ça en manière différente.

De l'autre côté, selon Schweier, G et al (2) un enfant est un être humain entre les stades de la naissance et de la puberté, ou entre la période de développement de la petite enfant et de la puberté. L'émergence de la sociocritique s'est produite en France par Claude Duchet en 1971 alors que la sociologie de la littérature existait. C'est l'étude des manifestations sociales dans la structure d'une œuvre littéraire, comment les personnages se relatent avec les uns les autres. C'est aussi une critique académique en relation avec des questions dans la société contemporaine

La présentation de violence dans *Brah la villageoise*.

La violence physique peut être la brutalité d'un être humain envers un autre. C'est le fait de battre, de brûler, de donner des coups de pied, de donner des coups de poing, de mordre, de mutiler ou de tuer ou d'utiliser des armes sur une personne. C'est la brutalité d'une Personne envers l'autre. Il s'agit d'un acte qui tente de causer ou d'entraîner de la douleur ou des blessures physiques. Cela laisse souvent un message de l'agresseur pour dire, Je peux vous faire n'importe quoi que vous ne vouliez pas se produire. La violence physique se dirige vers les objets comme ; claquer une porte, lancer un objet sur quelqu'un, donner un coup de pied sur un marbre, frapper dans la mer etc. (Goodin,1986) dit que plus de 46% des violences sont physiques. La violence physique peut exister même s'il n'y a pas de trace visible a l'œil. Donc, tout choc, bousculade ou agression qui fait entre de façon non volontaire, le contact d'un corps avec un autre peut être caractérise comme violence physique. Ce type de violence est plus répand.

Dans *Brah la villageoise*, La violence physique peut être vu lorsque Nimba a frappé Brah sa femme, une petite fille. Ce qui pourrait également être considéré dans ce cas comme la violence domestique. Nimba avait été très infidèle dans son mariage avec Brah. En tant que fille bien élevée, elle l'avait toujours respecté malgré son infidélité. Enfant, elle pensait probablement qu'elle pourrait faire ce que Nimba fait sans avoir de problèmes. Cela nous amène au point du fait que l'enfant sera toujours un enfant et naïve à la fois dans le raisonnement et autrement. Les enfants imitent ce qu'ils voient sans le bien comprendre. Croyez-moi, si elle avait su que son seul acte d'infidélité causerait sa mort, je suis sûr qu'elle ne l'aurait pas fait. En tant qu'analyste, j'oserais dire qu'elle aurait aussi pu le faire pour se venger sans se rendre compte des conséquences. Elle ne se rendait pas compte que son propre acte d'infidélité pouvait lui apporter de graves problèmes. C'était le début de la violence physique que Nimba son mari a commencé à lui faire porter. Il l'a fait plusieurs fois. Brah était brutalisé par son mari Nimba au point qu'elle a dû s'enfuir de la maison. Selon l'auteur,

> Plus par instinct que par volonté, Nimba la gifler a toute volée. Brah entendit ses oreilles bourdonner, sentir sur sa langue un gout de sang et les larmes lui montèrent aux yeux. Nimba se redressa, lui prit les chevilles et les écarta avec autant de force qu'il put brutalement, il fut en elle. Brah poussa un cri de douleur… BLV (pg 113).
>
> Nimba se leva, retrouvant une force inouïe, et donna un coup de poing à sa femme. Elle chancela et tomba cotre le mur qui entourait la cour. Il était déchainé. Les coups pleuvaient de nouveau. Devant les enfants effrayes, Nimba aurait pu éviter de donner libre cours à sa colère, mais pensez-vous ! Cyrille, le dernier fils de Brah, pleurait, essayant de s'interposer entre ses parents. (Pg 129).

Ces actes de violence ont conduit à la mort de Brah. Quand elle n'en pouvait plus, elle a pris la décision

de se suicider. François D'Assise Nda (2008) dans son livre *Le retour de l'enfant soldat,* expose que la violence physique est telle qu'elle multiplie la violence dans la société. Le livre s'ouvre sur l'auteur plein de questions sur les raisons pour lesquelles les conflits et les guerres surgissent dans la société humaine,

La situation de Zango est pire. Comme un enfant, Il a été intégré dans la guerre et commet des actes terribles de violence dans la société. Sous la forme de meurtres, de viols, etc., tout cela a causé d'un seul conflit. Encore une fois, la violence engendre plus de violence. Zango, sous l'influence de drogues dures, a commis des atrocités mêmes contre les membres de sa propre famille élargie. Quand Zango est rentré chez lui, juste au moment où il a mis les pieds dans le village, ceux qui l'ont vu ont d'abord commencé une manifestation violente contre son retour. Pourquoi ? Parce qu'il avait lui-même été violent envers les autres au cours de la guerre. Les jeunes du village se sont réunis et ont discuté la manière de ramener la violence pour la violence contre Zango. Ils disent;

> : … Non ! A mort, le rebelle Zango ! A mort… Aussitôt dit, la foule chauffée à blanc, armée de gourdins, de machettes de l'infortune Zango. La battue ne dura qu'une trentaine de minutes. Zango, ligote comme un bouc, était au sol par deux solide gaillards.la foule hurlait de rage : violeur ! Assassin ! violeur ! Assassine !... Zango qui était sérieusement blesse, suite aux nombreux coups qu'il avait déjà reçus… (Pg33)

Comme c'est horrible! Cela montre que chaque enfant est unique dans la façon dont il interagit avec le monde qui l'entoure et ce qu'il invoque et reçoit des autres et l'environnement façonne également sa façon de penser et de se comporter et, en fin de compte, l'âge adulte. Ahmadou Kourouma (2000) dans son œuvre *Allah n'est pas obligé*, expose des situations où des enfants sont tués. Ces actes accomplis avant les enfants sont difficiles à oublier. La plupart du temps, les enfants copient ce qu'ils voient sans connaitre l'implication. Cela augmente des violences et des crimes dans la société. Selon le narrateur,

> …Les enfants-soldats étaient chaque soir maitrises par des gens masques qui venaient enlever les habitants des campements. Les enlèves étaient trouvés le matin tues, asexues et décapités comme la petite Sita. [Pg186]

La violence psychologique:

Cela fait référence à tout acte qui cause un préjudice psychologique à un individu. Elle peut prendre la forme de coercition, de diffamation, d'insultes verbales ou de harcèlement. Cela affecte non seulement la santé mentale des individus et leur réseau social, mais les prive également de possibilités de développement personnel, social et économique futur. On sait que la violence est très réactive, ce qui est la plupart du temps dû aux conditions sociales, culturelles et économiques. Selon lui, la violence comportementale ne peut être comprise si elle n'est pas étudiée dans le contexte et la perspective de la violence structurelle qui est déterminée par les structures socio-économiques telles que la classe, le sexe, la race et la caste. Ayant été examiné les pratiques violentes en Afrique dans les contextes des systèmes de valeurs africains, des systèmes politiques et des structures économiques, il dit que la violence dépeinte par la plupart des écrivains africains est de nature despotique, raciste et patriarcale. Régina Yaou dans son livre *Brah la villageoise* par exemple dépeint une société très patriarcale. Elle se fait une image de la façon dont cela pourrait apporter tant de douleur aux femmes dans la société africaine. Elle utilise Brah pour expliquer l'étendue de cette douleur et les effets qui en résultent. Elle se fait une image de la façon dont cela pourrait apporter tant de douleur aux femmes dans la société africaine. Elle utilise Brah pour expliquer l'étendue de cette douleur et les effets qui en résultent. Une société patriarcale est généralement très instable et déséquilibrée. Tout le monde ne sera pas traité équitablement. Ce point de vue est l'un des thèmes que l'auteur condamne dans son livre. Elle focalise la question de la classe qui est une autre source d'inégalité dans les termes d'interactions socio-économiques. Brah et sa famille sont présentées comme un peu plus bas que Nimba dans toutes les ramifications. De la solidité financière à la solidité du ménage, etc. Brah n'avait ni frère, ni sœur de sang. Oh ! Il parait que sa mère avait eu des enfants avant elle ; deux garçons et une fille. Mais ils étaient morts tout bébé. (Pg14). Nous pouvons simplement nous contenter du passé de

Brah et de celui de Nimba, selon les mots de l'auteur :

> Elle, Kedjouhoun. En avait cinq ; Nimba, l'aine qui vivait à Abidjan ; le second, devenu marin… s'installer à Marseille…, il y a aussi les filles, tous deux mariées et vivant très loin d'ici, et enfin Dehi qui était rester au village, (Pg7).

Nimba était très supérieur entant que l'argent aussi. L'auteur décrire Nimba comme ce ;

> Nimba, l'instituteur, qui ne devrait pas tarder à les rejoindre. Celui-ci allait devenir très prochainement directeur d'école et le célibat dans lequel il semblait se complaire, risque de constituer un handicap pour cette promotion. (Pg9).

L'écart social entre Brah et Nimba était si énorme dans toutes les ramifications. C'était réalisable avant la colonisation en Afrique, mais aujourd'hui, la société africaine doit comprendre que les choses ont changé aux yeux de la modernisation avec le début de l'indépendance. Ils peuvent fonctionner de différentes manières dans différents contextes, mais ils sont tous déterminés historiquement et culturellement et sont psychologiquement dommageables. Les trois cas montrent que la règle de la violence est déshumanisante et provoque une fragmentation sociale et psychologique. Ce que je veux prendre c'est que, tout forme de violence aura toujours un aspect psychologique maintenant dans l'avenir selon la façon dont le destinataire le prend. Elle vise à réduire la confiance personnelle ou l'estime de soi de la victime. Les changements dans le cerveau causé par le stress psychologique peuvent affecter des facteurs tels que l'attention, le comportement impulsif, la prise de décision, l'apprentissage, les émotions et la réponse au stress, et la honte. Elle devait accomplir un acte de confession déshumanisant coupler à tous les coups qu'elle avait déjà reçus de son mari. Le suicide en soi est un vice ou un comportement déviant qui indique toujours que la victime a été traumatisée par une forme de violence ou l'autre pendant un certain fil du temps et ne pouvait plus le supporter. Ça explique exactement la situation de Brah dans *Brah la villageoise.* Tous les types de violence ont des effets psychologiques sur l'individu d'une manière ou de l'autre.

La Violence sexuelle

Articles 34 d'UN dit que,

> …l'enfant doit être protégé contre les violence sexuelles et de l'exploitation sexuelles, contre des personnes qui forcent les enfants à avoir des relations sexuelles pour l'argent ou faire des photos ou des films sexuels. Cela se passe lorsqu'une personne est forcée de participer involontairement à des activités sexuelles.

Un rapport sexuel non-consenti, c'est – à- dire un viol. Brah qui s'est mariée de force aurait subi des violences sexuelles. C'est une sorte d'agression ou des gestes à caractère sexuel avec ou sans contact physique, commis par un individu sans le consentement de la personne visée. La violence sexuelle comprend tous geste, parole et attitudes à caractère sexuel comme : embrasse, attouchements (seins, cuisses, fesses, pénis, vulve, anus), masturbation d'une autre personne, masturbation en public, contact oral génital (fellation, cunnilingus, unilingues), pénétration (pénétration vaginale par le pénis, sodomie, pénétration de l'anus ou du vagin avec les doigts ou avec des objets) etc. Le cas de Zango qui a violé une fille est très grave. Le résultat de cette action de viol est vu dans la décision de la villageoise de tuer Zango. Toutes ces actions constituent de violence dans la société parce que la violence engendre plus de violence. Ici nous avons la violence 'un enfant contre un autre enfant. Les villageoises crient ici… Nous allons lui trancher le zizi ! comme ça, même au paradis, il ne lui viendra plus jamais à l'idée de violer une femme. (Pg35)

Utiliser l'enfant pour obtenir ce que nous voulons, c'est la maltraitance et abus d'enfants. L'abus généralement, est la mauvaise utilisation d'une chose. Si un objet à des fins nobles est utilisé à des fins erronées ou est utilisé de manière incorrecte, il devient un abus de cet objet., Selon un rapport annuel publié par child helpline international, la maltraitance des enfants est lorsque quelqu'un, que ce soit par action ou par omission d'agir, cause des blessures, la mort, des dommages émotionnels, ou un risque de préjudice grave à un enfant. Les enfants sont confrontés à d'autres formes d'abus que nous n'avons peut-être pas mentionnées ci-dessus. Ils

ont maintenant l'habitude de faire beaucoup. Les enfants sont maltraités à l'école, ils sont maltraités à la maison et ils sont maltraités dans la société en général. Ils ne sont plus en sécurité nulle part. La maltraitance des enfants se déroule dans la société. Il semble qu'il n'y ait pas de fuyant, mais il y a sûrement un moyen si la société est déterminée à l'arrêter. La société doit y mettre un terme parce qu'elle ruine notre avenir collectif. Les enfants sont comme les graines que nous plantons aujourd'hui dont nous avons besoin pour l'avenir, donc sans eux il n'y a pas d'avenir. Un enfant ruiné est une réduction de notre croissance et de notre développement. Les parents utilisent leurs enfants pour satisfaire leur orgueil et leur ego. En Afrique en particulier, l'enfant est une source de telle fierté et la bonne éducation de l'enfant est maintenant en jeu. Certains poussent leur enfant dans le commerce de rue et toutes sortes de commerces. D'autres poussent leurs enfants dans des mariages précoces. Ils le font sans se soucier de ce que l'enfant doit éprouver de mal ou de ce qu'il ressent. Dans d'autres cas, l'enfant est utilisé comme un moyen de résoudre un problème. Tout cela et plus encore sont ce que les auteurs dénoncent dans leurs livres. Dans *Brah la villageoise,* Brah a été utilisé pour résoudre le célibat de Nimba et de s'assurer qu'il obtienne sa promotion. Ce Nimba a compris et il a abusé du geste et de l'enfant parce qu'il n'avait aucune valeur pour elle.

> … Il avait une réunion avec des cousins et des frères ainsi que son fils Nimba, l'instituteur, qui ne devrait pas tarder à les rejoindre. Celui-ci allait devenir très prochainement directeur d'école et le célibat dans lequel il semblait se complaire, risquait de constituer un handicap pour cette promotion. (Pg9).

Pour Zango, il était habitué à se battre, à défendre une position politique particulière et cela a conduit à tant de problèmes. Il était utilisé comme enfant soldat par des adultes. Selon François D'Assise N'dah' dans *le retour de l'enfant soldat,*
Ahmadou Kourouma (2000) dans son œuvre *Allah n'est pas obligé* nous dites… Un jour, trois campements des travailleurs des mines, on a découvert une jeune fille violée et décapitée. [P.185]. Il expose et condamne comme l'enfant est maltraité, il condamne les actes néfastes contre l'enfant.

La violence verbale.
La violence verbale est le type de violence le plus courant. La violence physique est la plupart du temps suivie de violence verbale au cours de laquelle toutes sortes d'abus et d'agressions sont déversés sur la victime. Ce type de violence implique l'utilisation de mots préjudiciables sur la victime. Même lorsqu'une agression physique ne suit pas la violence verbale, elle est déjà assez grave parce qu'elle est toujours et habituellement associée à la violence psychologique. Elle prend la forme de mots insultants, de cris sur la victime, etc. La violence verbale consiste également en des menaces de tuer ou de faire quelque chose à la victime qui pourrait causer des dommages à la personne. Cela met tellement de peur et de choc dans la victime.

La violence domestique
Ce type de violence a généralement lieu à la maison et autour d'un milieu de vie. Parfois, la violence domestique est utilisée comme un autre nom pour la violence conjugale que les personnes dans les relations intimes pratiquent, comme dans les mariages. Dans un sens plus large, il s'agit de violence contre les enfants, les parents et même les personnes âgées. Il se présente sous différentes formes ; l'abus physique, verbal, émotionnel, sexuel etc.it implique des coups, des jets d'acide, la défiguration, le viol, l'étouffement et même la mort s'il n'y a pas d'intervention en temps opportun. Souvent, l'agresseur pense ou croit qu'il y a droit ou qu'il est acceptable, justifié, plus fort, plus riche ou peu susceptible d'être dénoncé et puni pour cela. L'enfant doit être protégé de ce genre de violence qu'il subit presque tous les jours. Les parents utilisent leurs enfants comme fougère pour eux. L'enfant est destiné à les aider, mais pas à assumer la responsabilité des parents en prenant en charge leurs propres besoins ou mêmes ceux de leurs parents. Comme Zẻnabou Ahmadou dans *Chaque Chose en son temps* de Lynn Mbuko. Selon l'instituteur ; Elle est devenue marchande ambulante ?... Quel dommage ! Comment peut-on arrêter cette tradition ? Aller vendre des marchandises. Aller au champ quand ses camarades sont en classe ? pour nous, l'école passe avant tout on souffle ? (Pg39).

Beaucoup ont été exposés à toutes sortes de dangers. Certain ont perdu leur vie par cette manière. Certains parents donnent leurs enfants en mariage à ceux qui sont assez âgés et peuvent être leurs pères ou à un homme riche juste à cause de l'argent. C'était peut-être la situation de Brah parce que nous voyons une différence de classe dans la description que l'auteure donne à la famille de Nimba et celle de Brah.en tant que l'argent. Dans *chaque chose en son temps* de Lynn Mboku (2006), la narratrice affirme :

> C'est de l'argent ! Voilà Je suis très riche ! ...Cinq cents naira ! C'est une somme. C'est l'émissaire d'El-hadji Oumar, le grand commerçant qui me les a donnés…El-hadji a envoyé Hamza, son émissaire tout a l'heure pour demander la main de Zenabou en mariage. (Pg49)

. C'est un signal d'alarme pour une protection de plus en plus grande de l'enfant si nous voulons avoir une société sans criminalité. L'enfant doit être mis en premier cas de considération sécuritaire car il est plus vulnérable**.**

Conclusion

Le roman de Regina Yaou utilisé pour ce travail est clairement une réplique de la société post indépendant car il est écrit plusieurs années après l'Independence africaine donc c'est à nous de protéger l'enfant contre la violence. Ce travail indique clairement que les adultes sont toujours responsables pour l'enfant. Au début de ce travail, on a fait l'introduction générale de la recherche. On dit que l'Independence des pays africain doit être utilisé pour améliorer la vie de l'enfant. Cela veut dit que la souffrance de l'enfant à l'époque coloniale ne doit pas continuer. Dans ce travail, on a expliqué des mots clairs et on a discuté des types de violence que l'enfant souffre dans la société mais il n'est jamais trop tard pour arrêter la violence contre l'enfant pour avoir une meilleure société car l'enfant est le gardien de l'avenir.

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SOCIAL MEDIA ADOPTION FOR IMPROVED MARKETING AND ORGANIZATIONAL EFFECTIVENESS OF DEPOSIT MONEY BANKS IN BAYELSA STATE, NIGERIA

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Abstract
With the development of information and Communication Technology (ICT), the use of social media has transcended every aspect of human's life including business. The objective of this study is to examine the relationship between social media adoption for improved marketing and the measures of organizational effectiveness of Deposit money banks (goal attainment and competitiveness). The specific objectives, guided the formulation of the research hypotheses as well as the development of the research questionnaire. One hundred and thirty-six copies of the research questionnaire were distributed to respondents who are bank management cadre employees. cutting across the five deposits money banks which constitute the sample size. The sample size for this study was determined using the Taro Yamen's sample size determination formula. However, only one hundred and ten (110) copies of the questionnaire were valid for the analysis, these valid questionnaires were analyzed using the Spearman's Rank Order Correlation Coefficient and the summary of our results revealed that strong positive relationship exist between social media adoption for improved marketing and the measures of organizational effectiveness. Based on the findings the following recommendations were proffered: there is an urgent need for the deposit money banks in Bayelsa State to upgrade their various products and services marketing activities through the social media. If this is properly implemented, certainly, the products and services of these deposit money banks will be widely publicized to potential customers and this would be advantageous to the deposit money banks that take such initiatives. There is equally a need for effective modulation of the information and communication technology systems of the deposit money banks in Bayelsa State as this will make way for such banks to effectively and efficiently adopt the social media platform for the benefit of the organization.

Keywords: Social Media Adoption; Improved Marketing, Organizational Effectiveness; Goal Attainment; Competitiveness.

1.0 INTRODUCTION

The process of determining the extent of organization's performance level is called organizational effectiveness (Kimani, 2015). The concept of organizational effectiveness is otherwise called organizational success or organizational worth which associates with goal attainment. The effectiveness of the organization as such describes the extent to which it achieves its desired goals and objectives. Tsitsi, Contogiannis and Jembere, (2013) posit that organizational effectiveness is the extent to which an organization as a social system with the resources and means at its disposal fulfills its objectives without incapacitating its means and resources and without placing undue strain upon its members. Derham, Cragg and Morrish, (2011) proposed seven measurement criteria of organizational effectiveness. These measurement criteria are employee's satisfaction, profitability, growth rate of sales or revenue, financial growth, competitiveness of the company's products and services, public image and good will as well as adaptability. The measurement criteria postulated by this scholar is quite impressive and cuts across a wide range of issues and is not restricted to financial performance of any organization.

Technological developments, increasing market competition, globalization, economic changes, dynamic consumer buying behaviour and changing environment have brought about substantial changes to the manner in which firms communicate with current and anticipated customers (Njeri, 2014; Siamagka et al., 2015). Compelled organizations rapidly adapt and adjust in competent way to attain a competitive advantage over other competitors to improve organizational performance (Dodokh, 2017). Consequently, organizations are forced to seek to develop strategies for existence and progress (Franco et al., 2016). One of these strategies is organizations' involvement in social media usage (Akmese *et al.*, 2016).

Little has been done with regards to the relationship between social media adoption for improved marketing and organizational effectiveness in

deposit money banks. This study therefore, will empirically assess the relationship between social media adoption for improved marketing and organizational effectiveness of deposit money banks in Bayelsa State.

1.2 Statement of the Problem

Social media networking at the workplace has been touted as the most significant business developments of the 21st century since it has added another dimension to the way people communicate (Ray, 2008) and organizations are increasingly adopting social media usage for marketing, consumer outreach; employee participation and connection with other organizations (Munene & Nyaribo, 2013). On the other hand, there are concerns of the use of social networking sites in the workplace. There is the school of thought who believe that social media lead to loss in staff productivity through time wastage; data leakage from staff gossiping freely in an open environment; malware and phishing scams practiced by cyber crooks; the open access potentially offered to the company servers by lax and out-dated attitudes towards password (Weinberg, 2009).

Furthermore, majority of the studies that argue that using social networking sites reduces productivity in the workplace focus primary only on the time wasted because of social networking at the work place (Accountemps, 2010; Nucleus, 2009). These studies have little or no emphasis on the intrinsic impacts e.g. on motivation; creativity; job satisfaction of social media on employee productivity. In addition, these studies have been carried out in the USA where the prevailing conditions may not reflect the Nigerian situation. Munene and Nyaribo (2013) examined the effects of social media participation in the workplace on employee productivity with a limited focus on the amount of time spent by employees on the social media sites.

The major problem of this study is that extant literature in the area of social media adoption for improved marketing and organizational effectiveness is relatively lacking in extant literature, in the banking sector particularly in Bayelsa State. To the best of the researcher's knowledge, there is no empirical study on social media adoption for improved marketing and organizational effectiveness as it relates to deposit money banks. In other words, little has been done with regards to examining the relationship between social media adoption for improved marketing and organizational effectiveness in Bayelsa State. This study therefore investigated the relationship between social media adoption for improved marketing and organizational effectiveness of deposit money banks in Bayelsa State.

2.0 LITERATURE REVIEW

2.1 Overview of Social Media Adoption for Improved Marketing

Using social media can be a useful tool in the marketing field; it can reach the targeted audience with the least cost possible, reaching interested individuals regardless of their geographical locations, and at the same time help in building potential customers (Pradiptarini, 2011). Researches have revealed many methods on how customers can interact with firms and their brands such as consumer engagement with brand Face-book pages, creating brand content on YouTube or Twitter using some social media platforms (Gironda and Korgaonkar, 2014; Kim et al.,2014).

In a report about the use of social media in marketing by Stelzner (2016) found out that nearly 60% of marketers use the video tools that are supported through social media for marketing purposes, and more marketers are now using the new hot tool of the live video streaming. The use of social media helps to reduce time to reach potential customers about the existence and availability of a new product or service.

Using social media in business is a best-fit concept as it helps to niche the target customers effectively and businesses would be able to share the content of their products and services almost instantly (Derham et al., 2011) as soon as it is launched. (Caruso, 2016; Okazaki and Taylor, 2013). Reported that adoption of social media by organization will help to attract more customers or develop a new product based on feedback from social media. This therefore will help an organization to achieved its goals of productivity and profit maximization.

2.4 Theoretical Framework

2.4.1 Social exchange theory

Social exchange theory is a theory that cuts across many scientific disciplines, such as management, social psychology, and anthropology. This theory is a conglomeration of conceptual in this regard, all

social exchange theories share a number of common features.

The principles of this theory state that every interaction involves an exchange of goods and services and people try to get from others as much as they have given to them. The theory explains how we feel about a relationship with another person, depending on our perception of: the balance between what we put into the relationship and what we get out of it. The theory is based on the exchange of rewards and cost to qualify the values of outcomes from different situations for an individual. Therefore, this study is anchor on the social exchange theory.

2.5 Empirical Review

Tajudeen (2014) investigated the factors that influence the social media usage, the various purposes of using social media, and its subsequent impact on organizational performances among Malaysian firms for year 2012 based on a mixed method approach. That comprises web content analysis of Face-book pages for five hundred and sixty-seven firms. In-depth interviews among six organizations listed under the main board of the Kuala Lumpur Stock Exchange that was using social media effectively from five different industries, in addition to a questionnaire survey. The results of the study showed that the usage of Social Media (SM) had a stronger, positive impact on organizational performance in terms of customer service, information accessibility, cost reduction for marketing and customer service activities.

3.0 METHODOLOGY

3.1 Research Design

Survey research design was adopted for this study. The researchers' choice of this survey design was based on its relative advantage over other research designs within the context of the nature of the subject (human being) under study. The subjects of this study cannot easily be manipulated hence the survey design is most appropriate. This position is supported by the works of Zeb-Obipi (2007) Cooper and Schindler (2001).

3.2 Population for the Study

A research population is generally a large collection of individuals, organizations or objects that is the primary focus of a scientific enquiry. The target population of this study therefore comprised of the management level employees of five major deposit money banks with international business authorization operating in Bayelsa State, the choice of only five deposit money banks was premised on the convenience of the researcher, therefore, the personal judgment of the researcher informed the selection of only five banks.

3.3 Sample Size Determination

The Taro Yamen's Sample size determination formula was used to determine the sample size for this study. The formula was used with a 95 percent confidence interval (i.e. 0.05 chances that the sample is distributed in the same way as the population). Thus, the level of significance (e) is 0.05.

The Taro Yamen's formula is

$$n = \frac{N}{1+N(e)^2}$$

Where n = Sample Size Sought
e = Level of Significance
N = Population Size

Therefore,

$$n = \frac{206}{1+206\ (0.05)^2}$$

$$n = \frac{206}{1+170\ (0.0025)}$$

$$n = \frac{206}{1+0.515}$$

$$n = \frac{206}{1.515}$$

n = 136

Therefore, the sample size for this study consisted of one hundred and thirty-six (136) respondents cutting across the five deposit money banks in Bayelsa State selected for this study.

Again this sample size of one hundred and thirty six (136) respondents were proportionally distributed among the five (5) regional offices of the deposit money banks selected for this study, using Bowley's (1964) proportional allocation formula, given as;

$$nh = \frac{nNh}{N}$$

Where nh = Number of units allocated to each organization
n = Sample size
Nh = Number of employees in each organization
N = Population size

Substituting the formula above accordingly, the sample size distribution among the five deposit money banks are given below:

$$\frac{136\ x\ 49}{206} = 32$$

$$\frac{136\ x\ 38}{206} = 26$$

$$\frac{136\ x\ 46}{206} = 30$$

$$\frac{136\ x\ 37}{206} = 24$$

$$\frac{136\ x\ 36}{206} = 24$$

Table 3.1: Bowley's Optimum Size Distribution

S/N	GSM Firms	Accessible Population	Sample Size
1.	First Bank	49	
2.	Guarantee Trust Bank	38	
3.	Union Bank	46	
4.	Fidelity Bank	37	
5.	Zenith Bank	36	
	Total	**206**	**136**

Source: Research survey, 2023.

Having used the Bowley's optimum size distribution, the random sampling technique was used to select the sample elements in each stratum to obtain the applicable sample size for that stratum. Each population element was assigned a number varying from one (1) to 49, 38, 46, 37 and 36 for the strata respectively. The selection process continued in each stratum until the sample size of each (32, 26, 30, 24 & 24) was obtained. The sample size therefore, represents 66% of the total accessible population.

3.4 Reliability of Instrument

Reliability is seen as the consistency or precision of a measurement. Thus, a measurement is said to be reliable if it is consistent (Baridan, 2005. In this study, Cronbach's alpha test of reliability test was adopted to test the reliability of the measuring instrument, this was achieved with the aid of the SPSS software package.

3.5 Methods of Data Analysis

Zeb-Obipi (2007) states that data analysis technique involves putting plans in place for data preparation and presentation (elementary analysis), hypothesis testing (statistical analysis) and plans for interpretation of the results that are based on the data so prepared, and tested. This leads us to the recognition of three basic processes (primary analysis, secondary analysis and tertiary analysis).

For the purposes of this study therefore, the process of primary analysis involved the preparation of data which included editing, coding and scoring of data collected. Primary analysis also involved data tabulation or organization, including statistical tables, frequency distribution and graphic presentation.

In our study here, the data generated through the survey instrument was sorted, cleaned, coded and entered into the data editor of the ***SPSS*** software. In order to determine the strength and direction of the relationship between variables at the secondary level of analysis, inferential statistics (Spearman's rank order correlation coefficient) was used. It shows the correlation between two sets of data.

4.0 Data Presentation, Analysis and Results

Table 4.1 Distribution for indicators of social media adoption for improved marketing

	VLE	LE	UD	HE	VHE	N	Mini	Max	Mean	SD
To what extent does your bank use social media to advertise her products?	5	3	1	63	38	110	1.00	5.00	4.1455	.92703
To what extent is your bank seeking through the means of social media to promote its brand?	4	2	5	62	37	110	1.00	5.00	4.1455	.87615
To what extent does this organization operates through the means of social media in the evaluation of its performance marketing by getting feedback from (Likes, shares and follow-up of Instagram, Facebook, and Twitter)?	6	-	8	52	44	110	1.00	5.00	4.1636	.97234
To what extent does your bank use different languages in marketing through social media?	5	4	3	61	37	110	1.00	5.00	4.1000	.95735
To what extent has this company kept pace with trends and new social media sites to get a competitive advantage?	4	2	7	59	38	110	1.00	5.00	4.1364	.89317

Source: Research Survey, (2023) and SPSS Output

The results presented in Table 4.1 reveals that there was a very high extent that improved social media marketing was actively used within the banks. The study reveals that a majority of the respondents affirm to their experiences and uses of the social media as a means of marketing their products and services within their various banks. The evidence indicates that improved marketing is a significant feature and prominent instrument used by the deposit money banks as expressed by the respondents from the banks examined in the study. This is as all 5 indicators of the variable assessed are revealed to have significant mean distributions which (where $x > 2.0$) reflect the presence of the use of social media for marketing by the examined banks.

4.1 Goal Attainment as a Measure of Organizational Effectiveness

The information on the mean distributions of respondents' views on the questionnaire items relating to goal attainment which is the first measure of organizational effectiveness in this study are presented in Table 4.2 The measure is assessed based on 5 indicators all stated in positive form.

Table 4.2: Distribution for indicators of goal attainment

	VLE	LE	UD	HE	VHE	N	Mini	Max	Mean	SD
To what extent does this organization constantly monitor established targets to ensure standards are not compromised?	5	4	6	59	36	110	1.00	5.00	4.0636	.96998
To what extent is this organization consistent in the pursuit of resource minimization and process proficiency?	4	4	3	64	35	110	1.00	5.00	4.1091	.90204
To what extent is this organization strong in the assessment of its priorities and key objectives?	4	2	8	56	40	110	1.00	5.00	4.1455	.90702
To what extent does this organization invest substantially in the actualization of service quality?	2	6	6	59	37	110	1.00	5.00	4.1182	.87506
To what extent is this organization strong in sustaining the cohesiveness of its employees and workforce?	2	6	4	64	34	110	1.00	5.00	4.1091	.84967

Source: Field Survey, (2023) and SPSS Output

The table 4.2 illustrates the mean distributions for the indicators of goal attainment. The results identify goal attainment as having a high evidence (where x > 2.0) within the deposit money banks examined in the study. The results show that all 5 indicators project high mean distributions which reflect significant manifestations of goal attainment. This therefore describes the deposit money banks as poised at attaining the numerous goals set by the organization especially with regards to the effectiveness of the deposit money banks.

4.2 Competitiveness as a Measure of Organizational Effectiveness

The information contained in Table 4.3 is a presentation of the various respondents' responses on the test item instruments which measure competitiveness, the second measure of organizational effectiveness. All 5 indicators for the variable are all stated in the positive.

Table 4.3: Distribution for indicators of competitiveness

	VLE	LE	UD	HE	VHE	N	Mini	Maxi	Mean	SD
To what extent is this organization highly innovative?	3	5	5	62	35	110	1.00	5.00	4.1000	.88773
To what extent is this organization driven to standout through creativity?	2	4	4	66	34	110	1.00	5.00	4.1455	.79950
To what extent does this organization follow unique standards that distinguish the organization?	4	4	6	53	43	110	1.00	5.00	4.1545	.95000
To what extent does this organization support change initiatives and ideas?	6	3	5	54	42	110	1.00	5.00	4.1182	1.01124
To what extent does this organization consider quality as an edge and positioning factor?	6	1	7	53	43	110	1.00	5.00	4.1455	.98462

Source: Field Survey, (2021) and SPSS Output

Table 4.3 describes the mean distributions of indicators of competitiveness. The evidence reveals that majority of the respondents consider competitiveness as a significant feature and characteristic of organizational effectiveness in the deposit money banks. The results reveal that all indicators of competitiveness as having a high evidence (where x > 2.0) within the deposit money banks examined in the study. The results show that all 5 indicators reflect high mean distributions which describe and present the examined banks as being significantly competitive in their desired effectiveness.

4.3 Hypotheses on Social Media Adoption for Improved Marketing (SIM) and Organizational Effectiveness Measures

The formulated and tested hypotheses on improved marketing and organizational effectiveness measures are;

Ho_1: There is no significant relationship between improved marketing and goal attainment.

Ho_2: There is no significant relationship between improved marketing and competitiveness.

Table 4.4: Results of hypothesis test on Improved marketing (IM) and organizational effectiveness

			SMM	Goal	Comp
Spearman's rho	IM	Correlation Coefficient	1.000	.802**	.646**
		Sig. (2-tailed)	.	.000	.000
		N	110	110	110
	Goal	Correlation Coefficient	.802**	1.000	.639**
		Sig. (2-tailed)	.000	.	.000
		N	110	110	110
	Comp	Correlation Coefficient	.646**	.639**	1.000
		Sig. (2-tailed)	.000	.000	.
		N	110	110	110

**. Correlation is significant at the 0.01 level (2-tailed).

Source: SPSS Output, 2021

Key:
** = Correlation, at 0.01 significant level (2-tailed) i.e. $p < 0.01$
Rho = Spearman's rank order correlation coefficient
IM = Improved marketing
Goal = Goal attainment
Comp = Competitiveness

i. Based on the outcome of the analysis above with a correlation (r) value of 0.802 and $P<0.05$, the null hypothesis three is therefore rejected based on the significance of the relationship between the variables. Thus, there is a significant relationship between improved marketing and goal attainment.
ii. Based on the outcome of the analysis above with a correlation (r) value of 0.646 and $P<0.05$, the null hypothesis four is therefore rejected based on the significance of the relationship between the variables. Thus, there is a significant relationship between improved marketing and competitiveness.

4.4 Discussion of Findings

The essence of discussing the finding of a study is to guide the researcher(s) in drawing worthwhile conclusions. Therefore, the discussion of finding in this study was done to establish the outcome of our empirical analysis on the relationship between social media adoption for improved marketing and organizational effectiveness as used in this study.

4.4.1 Positive and Significant Relationship between Social Media Adoption for Improved Marketing and Organizational Effectiveness

The findings relating to the association between improved marketing and organizational effectiveness revealed the existence of a positive and significant relationship. Evidence from extant literature (Ozer and Uncu, 2015; Kimani (2015), revealed that improved marketing is a dimension that enables the business organizations to effectively position their goods and services through the social media, offering such to existing and potential customers with the expectations of increasing sales as well as the customer base of the business organizations. There is also the tendency when business organizations engage customers in positive marketing activities via social media and maintain their marketing strategies such organizations would likely surpass their competitors that are not incline to the use of improved marketing strategies.

The findings from our present study support that of the earlier finding of Mwangi and Wagoki (2016) in which they found out that improved marketing is positively and significantly associated with organizational effectiveness of businesses. Consequently, improved marketing will positively affect the organizational effectiveness of deposit money banks in Bayelsa State.

5.0 CONCLUSION AND RECOMENDATIONS

5.1 Conclusion

The results and findings of this study reveal that there is a positive and significant relationship between social media adoption for improved marketing and organizational effectiveness (goal attainment and competitiveness). It is therefore concluded that deposit money banks that seriously adapted to the social media would positively employ the social media to maintain an improved marketing exercise and experience with potential prospects and customers, which will be instrumental in the success of the deposit money banks in Bayelsa State.
It was also affirmed that the deposit money banks in Bayelsa State take advantage of the opportunities created by the social media to establish a positive and interactive marketing relations with their customers who can make them relatively competitive in the ever dynamic banking industry particularly in Bayelsa State.

5.2 Recommendations

Based on the findings of the study as it relates to social media adoption for improved marketing and organizational effectiveness of deposit money banks in Bayelsa States, the following recommendations are made.

(1) There is an urgent need for the deposit money banks in Bayelsa State to upgrade their various products and services marketing activities through the social media,

if this is properly implemented, certainly, the products and services of these deposit money banks will be widely publicized to potential customers and this would be advantageous to the deposit money banks that take such initiatives.

(2) There is equally a need for effective modulation of the information and communication technology systems of the deposit money banks in Bayelsa State as this will make way for such banks to effectively and efficiently adopt the social media platform for the benefit of the organization.

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THE IMPERATIVE OF WEB-BASED APPLICATION FOR SELECTION AND ALLOCATION OF PROJECTS TO UNDERGRADUATE SCHOLARS IN TERTIARY INSTITUTION

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ABSTRACT

The use of computers in carrying out divers' activities or tasks makes work easier, saves time, and also prevents a lot of manual errors. It is a known fact that Nigeria's tertiary institutions are still facing the challenge of not adapting quickly to new technological innovations. In many Nigerian tertiary institutions, the allocation of projects to students is still done manually. The implication is that students are assigned to supervisors without taking into account the research area of interest of the supervisors, and a lot of complexities and inadequacies arise due to the absence of a central system that monitors and coordinates the activities of both students and their supervisors in the manual system. Allocating the right research supervisors to students is critical to the success of an academic research process and cannot be undermined. The negligence of students' research interests, supervisors' research interests, and the use of arbitrary allocation approach by research coordinators give rise to the high possibility of mismatching supervisors to research students, which usually leads to research process failure. The aim of this research is to advocate for the introduction of a web-based automated system for the allocation of project supervisors to final year undergraduate student in Nigeria tertiary institutions. Web-based technology is a service geared towards providing all-round access to a safe and centralized database. The application of web-based system will improve the efficiency of research coordinators in selecting research supervisors for undergraduate students. Web-based technology creates a time-limit challenge for result delivery. Based on this, a system of web-based technology has been built for mobility, easy access, and faster delivery of output for student project supervision. Conclusively, we strongly recommend the application of web-based automated system for project supervisors' selection for undergraduate scholars in tertiary institution.

Keywords: Undergraduates, Project, Supervisors, Web-based

INTRODUCTION

In the information age that we live in, there is a rapid change in information and communication technologies (ICT), which have become common in every field of our lives. The tools and materials that we use in our daily lives are renewed almost daily. Parallel to these changes, ICT applications have inevitably entered into learning and teaching activities. The use of computers in education, which are among the main ICT devices, dates back to the 1950s.

Applications in this field have been defined using many different terms, such as computer-aided education (CAE) and computer-based teaching (CBT) (Watson & Watson, 2007). With the introduction of the internet and its use in education, many other terms such as web-based training, web-based instruction, web-based learning, and internet-based instruction were added to the terms mentioned above. All of these terms define the same thing, more or less. For example, information technology-based resource allocation solutions are well-appreciated in modern business operations, including the education sector. However, there seems to be a high demand for improvement and extension of this technological support in the field. One area for which such demand is placed is the research allocation solution, which has to do with the mapping of students to research supervisors. It is evident that inappropriate mapping is one of the causes of unsuccessful research. In some cases, students end up with low levels of satisfaction when it comes to the allocation of research supervisors, as seen in most higher institutions of learning.

Conceptually speaking, resource allocation is the distribution of the available resources in an economical manner. The allocation of research supervisors as resources is like a subset of the

resource allocation problem that requires fair treatment for both the supervisors and supervisees. Other related resources in this kind of problem are the projects, supervisees, and academics, which comprise the supervisors and examiners for different projects.

The research allocation process usually results in a many-to-one mapping from supervisees to supervisors, with each linked to a defined project. There are many ways of conducting this process, but it should be self-evident that as numbers increase, so does complexity.

According to Curtis et al., (2010), research allocation is a many-faceted process-it may be construed as:

a. the allocation of supervisees to supervisors (who then define a project)
b. the allocation of projects to supervisees (with an implicit supervisor), or
c. the allocation of a student-supervisor pair to a project.

Usually, the students will be assigned supervisors who are well-learned in different fields (especially fields that are related to the topic allocated to the students), and this process of allocation is usually monitored and approved by the Head of Department (HOD). The major role of these supervisors is to guide the students on the right format for information retrieval, analysis, development, and implementation (if necessary).

Research opportunities are meant to develop student-researchers' problem-solving, analytical, evaluation, and programming skills in a field like computer science. A typical computer-based research format would require the student to see how some aspect of theory, software, or hardware that they are familiar with can be enhanced or developed into a product or a hardware or software tool.

Supervisees in higher educational institutions are required to conduct research on different aspects of their academic programs. This is a requirement for the completion of their courses and graduation. The supervisees are to be supervised by their lecturers, who are specialists in their fields of study.

In many Nigeria tertiary institutions, supervisees seek a project in a given field of specialty as part of their degree program (Fabiyi et al., 2016). Allocation of supervisors to supervisees, assessment procedures, access to resources, support, supervision, and general management of projects can be considered key influential parameters that govern supervisees' learning experiences during the final year project (Teo and Ho, 1998).

For example, if supervisees were assigned to projects or supervisors arbitrarily, without considering supervisees' preferences or project supervisors' research interests, this would generally result to a poor or unsatisfactory relationship between the student and the supervisor (Salam and Mamma, 2016). Therefore, project allocation is a resource allocation problem with certain constraints that enhance the students' learning experiences and satisfaction; it is also very important to consider supervisees' preferences for supervisors.

Several factors affect students' choices of projects supervisor. These include the popularity of the supervisor, their personal relationship with a specific supervisor, and the academic position of the research supervisor (Jessup and Valacich 2008). In some tertiary institutions, lecturers have preferences over students in addition to their preferences for the project topics they propose. There may be restrictions on the capacity to limit the maximum number of students assigned to each project lecturer, and the allocation problem subject to these restrictions is called the student project allocation problem (Manlove and Malley, 2008). Because of the large numbers of students, it is time-intensive and error-prone to calculate an optimum allocation of students to projects manually; some tertiary institutions tend to use central systems that automate (web based) the process of allocating students to projects by employing some algorithms that depend on effective matching techniques.

Research resource allocation in higher education is of high importance because it is concerned with the satisfaction of the supervisor and the supervisee through the resources received. This

criterion focuses on how educational institutions manage their allocation process.

Research supervision is a complex and subtle form of teaching. In this study, we regard research supervision as a teaching process for the supervisor and a learning process for the student. The project is a module that provides the supervisees with the opportunity to design, undertake or conduct an independent piece of research or study related to their programme of Studies under the guidance of a supervisor, who is normally a member of the academic staff (full-time or part-time) assigned by a research coordinator who may also be appointed subject on approval by the Head of Department (Abraham, et al., 2007).

1.1 Statement of the Problem

The manual system of allocation of supervisors has been in existence for several years; however, several drawbacks have been identified in this approach, some of which include: duplication of project topics among students by several supervisors; lack of transparency in the allocation process; difficulty in accessing supervisors; lack of proper monitoring and reporting of the supervisory process; and poor topic allocation processes, which later result to plagiarism, outsourcing; difficulty in accessing softcopies of previously approved projects; difficulty in accessing project supervisors for approval of topics, etc. If supervisees were allocated to projects or supervisors arbitrarily, without considering supervisees' preferences or project supervisors' research interests, this would generally result to a poor or unsatisfactory relationship between the student and the supervisor (Salam and Mamma, 2016). It is very essential to consider supervisees' preferences for supervisors. Introducing a web-based system will automate the allocation, selection, or scheduling of project supervisors for undergraduate final-year students and this will help to eliminate the problems associated with arbitrary allocation. The aim of this paper is to bring to the fore the draw backs of manual system of student project supervisors' allocation and the imperative for the application of web based automated system for the selection of project supervisors for undergraduate research scholars in Nigeria tertiary institutions

2.0 OVERVIEW OF STUDENT RESEARCH PROJECT

2.1 The Concept of Research

According to Oxford Advanced Learner's Dictionary (2010), research is a careful study of a subject especially in order to discover new facts or information about it. Aloysius, (2011) defined research as a logical and systematic process of finding out solution to a problem. He further asserted that research is based upon data unlike other phenomena such as a guess, a dream, an imagination or prophecy that are not usually based on data. Research is a curiosity-driven activity that has the purpose of discovery and advancement of knowledge. The focus of research can range from physical thing, an event, a process, a social institution of a social condition, biological condition, etc. Irrespective of the subject, research basically seeks to understand what is being researched into (through observation, experimentation and analysis) in order to arrive at a better understanding or a definite conclusion on the subject matter (Ajala, 2002).

There are several definitions of research, and each of the definitions captures a vital aspect of the concept which cannot be overlooked or overemphasized, as a result, there is no one concrete definition of the term.

According to (Ruth *et al*., 2016), research is an investigative process of finding a reliable solution to a problem through a systematic selection, collection, analysis, and interpretation of data relating to the problem. The researchers also added that research is all activities that make us discover new knowledge about things around us.

Stephenson, *et al*. (2006), defined research as the manipulation of things, concepts, or symbols to generalize to extend, correct, or verify knowledge, whether that knowledge aids in the construction of theory or the practice of an art. According to Nworgu (2006), research is a controlled enquiry which is directed towards solving identified problems and its outcome

provides basis for societal development. In the same vein, Kulbir (2013) states that research is a scientific investigation which is meant to discover new idea, correct old practice and suggest solutions to existing problems.

In the tertiary institution, the undergraduate research project is a final year course that requires students to conduct research individually and independently, under the supervision of one or more supervisors. For undergraduate and postgraduate students in higher institutions of learning, research projects are a graduation requirement that usually has high credit units. According to Ebardo and Valderrama (2009), the implementation of the research project for final-year students is a peak for the learning process of an undergraduate student in some polytechnics, whereby students need to apply all the knowledge that has been learned, including the scientific and engineering knowledge and even the generic and personal skills, and transform them into a research project. The research project implementation aims to expose and provide relevant experience to students in practical work where students' competency is assessed (Karzai *et al*., 2008).

2.1 Concept of Supervisor Allocation

The Encarta dictionary defines a 'Supervisor' as a teacher assigned to supervise the work of an individual student, especially research done by a graduate student. Supervisor allocation (Salami., and Esther, 2016) is concerned with allocating project supervisors to students taking into account the student's preferences for lecturers as well as lecturer supervision capacities. "Resource allocation is the assignment of available resources to various uses" Supervisor allocation is a resource allocation problem where the key constraints are to load the staff appropriately while matching projects to students' demands.

Together with the allocation of students and supervisors, another important allocation is that of the examiners. Examiners will be the person in charge to assess the final year projects. One examiner is currently assigned to each undergraduate project. This is done transparently according to their area of expertise and experience in their respective fields.

2.2 Roles of a Supervisor in Academic Research

The supervisor plays significant roles in the supervisees' research writing. The main functions of a research supervisor are to assist, encourage, guide and support supervisees throughout their academic research writing (Imperial College, 2014). Supervision of research work is an activity that facilitates supervisees' development towards becoming independent and critical scholars in their respective fields of study (Pimmer et al., 2016). Supervisors are expected to provide series of expertise in the supervision of their supervisees' research work.

2.3 Needs for Supervisory Input

Selecting research supervisor is critically important in the entire research journey that students embark on (Ives and Rowley, 2005). The process of selecting supervisors differs across institutions. Ideally, a student's choice should be given prime importance, but quite often it is not (Lessing and Schulze, 2002). Some studies have discovered that students are unaware that they have a choice of selecting their own research supervisors (Ives and Rowley, 2005). In selecting a supervisor, students should collect basic information such as supervisor's area of expertise, number of supervisees under their supervision, and their publication record prior to initiating their research studies.

Various studies have reported on the importance of interpersonal relationships between graduate students and their supervisors as a determinant of student success (Lessing and Schulze, 2002). It is widely emphasized in the literature that the clarification of the roles and expectations of both student and supervisor should be made early in the candidature to avoid potential frustrations and dissatisfaction that could eventually lead to unsuccessful candidatures (Karazi, et al., 2008). Moussa, et al., (2011) argued that the "nature of the contract" between student and supervisor regarding contributions and joint efforts from both parties should be made clear at the onset of

the research project. This clarification would optimize both the enjoyment of the experience and the chances of a successful outcome. Both the department and supervisors must be attentive in working with students to establish these mutual expectations, responsibilities and benefits for working together (Phillips and Pugh, 2005). Based on the work of Moses (2004), survey tools have been developed to assist in clarifying role expectations in supervision between the supervisor and student.

The supervisor often becomes the face of the faculty for graduate students, which Lessing and Schulze (2002) refer to as an essentially privatized and personalized relationship, which is traditionally conducted behind closed doors. Karazi, et al., (2008) reports that graduate students often experience frustration as a result of a perceived lack of support or what is referred to as a disjunction in expectations between the student and the supervisor. Lessing and Schulze (2002) describe the supervisory role as a balancing act between various factors: expertise in the area of research, support for the student, critique, and creativity. Ives and Rowley (2005) emphasize the importance of matching supervisors to graduate students in terms of both topic expertise and working relationships. These researchers also note the changing needs of graduate students, which may necessitate a change in supervisory practices as students' progress through a graduate program.

2.4 Factors influencing student's choice of project supervisors

Supervisor's profile is one of the most important factors that influence students' choice of a project supervisor. Some of the attributes that endear lecturers to students to be their project supervisor are; good teaching skills, friendly student rapport etc. Most students' primary expectation from their supervisor is "to ensure the student is on the right track, offering constructive criticism and offering guidance when necessary". It is also evident from the report of Todd et al., (2004) that supervisors who provide constructive feedback on draft work are highly appreciated. The report also argued that approaches adopted by tutors towards supervision varied greatly in terms of formality. Certain supervisors had a relatively relaxed approach, initiating preliminary meetings but then leaving it to the student to request support when needed, with others being more formal and directive, example, establishing a supervision timetable for the year; producing a written record of each meeting and drawing up a formal contract of rights and responsibilities. Although the majority of interviewed students thought that the latter approach was useful for them, there were many who preferred supervisors adopting the former approach.

3.0 MANUAL METHODS OF STUDENTS RESEARCH PROJECT ALLOCATION

Undergraduate final-year projects offer opportunities for students to undertake independent project work and to develop subject-specific and generic skills. It also provides an opportunity for staff to work closely with the student and strengthen individual students' skills, which are not visible from a standard course assessment. However, the success of achieving some of these underlined objectives also depends on the project allocation scheme used at the beginning. Some methods used by tertiary institutions to allocate projects to students are as follows.

I. **Project Selection by Students Based on Project Titles**

II. This is a popular SPA (Student project allocation) system, where students choose their projects by themselves based on the project titles provided by the supervisors. Many higher education institutions worldwide have adopted this system to allocate final-year projects to students proposed an algorithm (Cheung., et al., 2004), which was intended to find an optimal allocation scheme that best matches a student's preference to the student's eligibility for the corresponding project, subject to the constraints in the student's ranking, their prioritized project selections, and available project spaces. This allocation scheme ensured that everyone get a project that best matches the student's personal preference with their ranking.

III. Harland., Pitt, and Venetia (2005) carried out a case study to compare the

factors that influence students' choice of project in the two allocation systems, namely the choice of specific title and choice of the subject area followed by negotiation, and to determine whether different factors were relevant. This case study demonstrated that there is no significant difference in the factors affecting student project choices between allocation by project title and allocation by subject area followed by individual negotiation. However, SPA by project titles has benefits, such as it saves the supervisors' time spent on negotiations with students regarding any project. It also ensures that the higher-ranked students get their desired projects to work with.

IV. Project Selection by Students Based on Supervisors and/or Project Category

Sameerchand., et al., (2016), stated that no allocation system can guarantee that every student gets their first choice when the number of students is significantly greater than the number of available supervisors. They proposed a novel method based on a ranked list of supervisors, as well as categories provided to students, where a category corresponds to a general research area. A student's satisfaction may therefore correspond to getting a project either with a highly-ranked supervisor and/or in a highly-ranked category. Although they claimed to have an improved level of satisfaction in students and academics, this method could be more time-consuming as students have to negotiate the project title with their preferred supervisor or in their preferred area of research even after the allocation. A similar problem will occur in the method proposed whereby they proposed assigning supervisors to students rather than assigning project titles by using their algorithm. According to them, the advantages of this method are that the projects are not required to be available at the time of allocation, and students and supervisors can discuss their project ideas/topics with each other after the allocation.

V. Project Allocation Based on Students' Proposals

Another common and popular way of SPA is a "student-led" allocation system. In this system, students design their project and approach a member of staff to be their supervisor. Students contact supervisors directly via e-mail or in person, and it is up to that member of staff to agree to supervise the student or refer them to someone else. The topic and content of the project are established entirely between the supervisor and the student. Thus, a minimum of admin staff support is needed until after the topic and supervisor have been identified. There are some positive aspects of running a student-led model as Harland., Pitt, and Venetia. (2005) stated that projects suggested/proposed by students promote active student participation. Despite having these advantages, the student-led model also raises several issues for the undergraduate cohort as a whole. First, most undergraduates find choosing a research topic difficult as undergraduate students rarely have deep knowledge of any particular area to identify a research rationale. Students often identify a very general topic area for research, and usually produce research questions that are too broad to be tenable. This can end up with the supervisor suggesting a very different topic afterward in negotiations, where students can feel disenfranchised as their ideas are set aside and they are channeled into a project for which they have less interest, enthusiasm, and ownership suggested that asking students to create their projects from scratch presents a few difficulties and takes considerable time. Analysis of the literature and informal feedback from those involved suggests that the student-led system is unsatisfactory for the majority of staff and students.

VI. Matching Discipline Expertise and Research Supervisor

Selecting a supervisor for undergraduate research generally requires finding a match between the supervisor's expertise (or interest at least). Such a match in supervisors' expertise and students' research topic is endorsed by the idea that supervisors should possess specialist knowledge in a specific discipline, which enables supervisors to guide undergraduate students' research (Gallagher et al., 2008). However, matching the discipline expertise of a supervisor and a topic of a student is often a decision based on institutional arrangements (example, staff availability) and the subject nature of student's research topic (Wilks, 2006). There were also cases where undergraduate students nominated supervisors on grounds of personal knowledge (i.e., they knew the supervisors through previous work experience). Although most of their participants chose their supervisors on the basis of their research expertise, those few who did so on the basis of personal reasons could run the risk of being supervised by academic staff members who have little expertise in their area of research. Satariyan et al., (2015) found that students with discipline-expert supervisors are better exposed to appropriate literature in a particular area of study. This finding implies that supervisors' discipline expertise contributes to development of a well-structured thesis, thereby enhancing its quality. Despite the multitude of learning opportunities for the students provided through initiatives that target specific research skillsets (example, training on theories, data analysis programs, research writing), one could argue whether the role of supervisors in providing discipline-specific guidance could be replaced by other forms of training. Since discipline-specific training is not available in research skilling provisions, the role of supervisors in facilitating students' development of discipline expertise deserves scrutiny.

VII. Project Selection by Supervisees Based on Project Titles

This is another popular SPA system, where supervisees choose their projects by themselves based on the project titles provided by the supervisors. Many higher education institutions worldwide have adopted this system to allocate final year projects to supervisees (Cheung et al., 2004). They described the method the Department of Civil Engineering of the National Polytechnics of Singapore follows to allocate the projects to final-year supervisees. They proposed an algorithm, which is intended to find an optimal allocation scheme that best matches a student's preference to the student's eligibility for the corresponding project, subject to the constraints in the student's ranking, their prioritized project selections, and available project spaces. This allocation scheme ensures that everyone gets a project that best matches the student's personal preference with their ranking.

3.2 DISADVANTAGES OF MANUAL SYSTEM OF PROJECT SUPERVISORS ALLOCATION TO STUDENTS

Disadvantages of Manual Supervisor Allocation System

Manual supervisor allocation system is an arbitrary human system used to allocate supervisors to students for their academic research work and support. However, there are some potential drawbacks to the manual supervisor allocation system that are worth considering. The disadvantages of manual system are;

1. Manual supervisor allocation systems require significant time and effort for both the Dean/HOD's in charge of setting up the system and for supervisors as they respond to requests, set up meetings, and provides support for students. This can be a significant burden for Dean/HOD's who must manage the system and for the supervisors who are tasked with providing support.
2. Manual supervisor allocation systems rely heavily on communication between the various parties involved. This can be a

challenge in large educational institutions where communication is not always timely or clear.

3. Manual supervisor allocation systems can be inefficient since staff must respond to student requests for supervision on an individual basis. This process can be slow and prone to errors, resulting in delays that can be detrimental to students who need assistance.
4 Manual supervisor allocation systems may not be able to accommodate large numbers of students or the complex needs of those students. This can lead to students not receiving the support they need from their assigned supervisor or supervisors being stretched and burdened due to large number of students they may have to support.

4.0 TECHNOLOGICAL INTEGRATION FOR PROJECT MANAGEMENT

At present, technology/computers are widely used for varied purposes. Educational, commercial, industrial, administrative, transport, medical, social financial and several other organizations are increasingly depending upon computers to some degree or the other.

Computers can facilitate research work. Innumerable data can be processed and analyzed with greater ease and speed. Moreover, the results obtained are generally correct and reliable. Not only this, even the design, pictorial graphing, and report are being developed with the help of computers. Hence, researchers should be given computer education and be trained in the line so that they can use computers for their research work.

4.1 Some technological approaches to students project allocation systems

Vial, et al. (2018) proposed a Java program for automatic team allocation in project-based coursework. The proposed system aided quick allocation of students into optimal or suboptimal teams based on prearranged guideline. The use of team allocation software demonstrates that it can find, in a short time, the solutions highly compliant with the team allocation criteria selected using a simple algorithm. The software reduces the time needed for allocation. On estimation, the software saves at least 8 hours of the coordinator's time. However, a drawback of this software is that mobility is difficult and requires moving installed devices from place to place.

Tayal et al. (2017) proposed a student project management system for the faculty of engineering and technology. They developed SPAM (Student Project Allocation and Management) a Web Application that automates the whole project management system through which the documentation related to the project tasks could be viewed. The system provided a platform where the guide could allot tasks to their respective group, and students could choose their group and choose their project guide. The project guide could allot Project-related tasks, and other faculties could only give reviews on it. Students could directly upload their proposed work and the documentation on this system to evaluate it.

Srinivasan and Rachmawati (2008) proposed an efficient fuzzy evolutionary algorithm-based approach for solving the student project allocation problem. They adopted an effective fuzzy evolutionary algorithm for designing the allocation model. They also presented a result frame for the pupil design allocation (Gym) problem grounded on evolutionary algorithms (EAs). The EA-based project allocation system was implemented in a large polytechnics department to automate this process and enhance scholars' matching to their desired projects.

Gerasimos (2012) Proposed an online project allocation system. Their proposed model was web-based and allowed the allocation to take place securely over the internet, irrespective of the location and the device used to access it. A security mechanism was integrated into the system to restrict access and allow only authorized parties (the people responsible are allowed to perform the allocation and view the sensitive data).

5.0 THE IMPERATIVE FOR WEB-BASED APPLICATION FOR SUPERVISOR ALLOCATION

As the number of students requiring projects is increasing in our tertiary institutions couple with the obvious draw backs of manual or arbitrary

allocation of project supervisors to undergraduates scholars, it is imperative to move from the old paper-based (manual) system of project allocation to web-based technology.

Web-based applications are applications that are used either over the Internet or Intranet. In other words, web applications are used over a network. Sometimes, the term can also be used for applications that are hosted on a web browser-controlled environment. Web applications run through web browsers like Google Chrome.

5.1 **Benefits of Web-based Application**

Web-based tools provide integrated environments of various technologies to support diverse educators' and learners' needs via the Internet. The goal of these tools is to enhance face-to-face instruction and to deliver distance-learning. Web-based tools allow one to carry out online task. learning activities are done on a web browser and no separate download or installation of other software is required **(**Kilby, 2008). All the learning activities are accessible from anywhere there is internet connection.

Paul (2018) further highlighted the following benefits attributed to web-based applications:

i. Zero install - all PCs have a browser.
ii. Reduce business costs - less time spent talking to customers over the phone; eliminate printed materials; allow users to update their details.
iii. Centralized data is secure and easy to back up.
iv. Quick and easy updates.
v. Reach anybody, anywhere in the world.
vi. Available 24 hours a day, 7 days a week.
vii. Low PCs or smartphones can be used.
viii. Online training can be completed at the user's own time and pace.
ix. Direct access to the latest information - for Employees where ever they are located.
x. User friendly: This system is user friendly for the retrieval and storing data and it is fast to store the data.
xi. Reports are easily generated
xii. Less paper work
xiii. Always up-to-date.

5.2 Advantages of web-based system

The present system that is been used has no or little computer help or application. Most Tertiary institution's project works are done on paper, which involves more human physical capabilities on supervisor to the student. This system will involve a student's login portal, student-supervisor selection based on their area of specialization portal, supervisor's account/login, and administrator/dean/ coordinator portal, Assor, and Friday (2022). The system has the following advantages over the existing system:

a. Fully automated supervisor and project allocation procedure without any human input.
b. Data duplication in terms of supervisors is eliminated.
c. The proposed system guarantees proper planning, monitoring, and transparent system, such that the students are satisfied.
d. The archiving system provides a guide for the execution of future projects for the students and therefore simplifies their research program.
e. The web-based system can be accessed from anywhere, on any device, and at any time by the authorized parties, conveniently.
f. The web-based system will allow the students to select their supervisors based on their area of specialty.

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

A web-based application for project supervisors' selection for undergraduate research scholars (WAPSSU) will facilitate final year research projects in tertiary institutions. The system can significantly reduce the workload of the project coordinator. The tasks of arrangement, announcement, collection, and assessment can be done automatically. On the other hand, the system provides convenience for both supervisors and students throughout the process of the final-year project. First, supervisors and students can better communicate via the chat and messaging tools in the system. Supervisors can also easily keep track of the progress of student's projects and share information. Finally,

this attempt will eliminate manipulation in the allocation and has also provided an easily accessible platform for proper guidance and monitoring by the supervisor.

6.2 Recommendation

We strongly recommend the implementation and deployment of WAPSSU in n Nigeria tertiary institutions.

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STATELESS HOST COMMUNITIES IN THE OIL AND GAS MAP OF NIGERIA: OJOBO COMMUNITY AS A CASE-STUDY

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ABSTRACT
The Niger Delta, which is home to the bulk of the oil wealth in Nigeria, is no stranger to different forms of conflicts for decades. Studies have attributed the conflicts to a number of causes, chief amongst them is the denial of access to benefits from natural resources within their immediate environments. This paper investigates one particular species of these problems, that is, the non-recognition of trans-state-boundary Communal customary ownership rights in the extant laws of Nigeria for purposes of accessing statutory allocations from petroleum resources across the borders of federating units in Nigeria. The implication is that such host Communities are denied the prospect of benefitting from the constitutional 13% Derivation Funds allocated to oil producing states of the federation and possibly the 3% for host community development enshrined in the Petroleum Industry Act (PIA). The findings of this study reveals that the phenomenon is not only a denial of the recommendations of various state boundary commissions but also a gross violation of the fundamental rights of these affected host communities, thus, rendering them stateless in the oil and gas map of Nigeria. The paper recommends a special constitutional and legislative intervention to take care of the subsisting injustice in the land.

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Keywords: Trans-state boundary, customary communal rights,13% derivation fund, host community development, PIA, Statelessness

1.0 INTRODUCTION

1.1 Background of the study

Land is a free gift of nature which has in its storehouse various mineral resources, including crude oil and gas deposits. Crude oil is a fugitive resource[1], that is, it is migratory in nature and flows like water under the ground and lies pooled in rocks where Nature has deposited it irrespective of the boundaries humans place on the surface of the Earth.[2]

In other words, the deposition of crude oil, naturally, does not take into cognisance the nature of surface land boundaries. It can be deposited and found in or across state boundaries within a country or even across national boundaries. Irrespective of where and how crude oil is found, host communities who are the indigenous people in such environments should not be denied of benefits accruing from such natural resources in terms of distribution of wealth and developments thereto. This position is predicated on the fact that such mineral resources are exploited from their ancestral domains and that the people are at the mercy of all the environmental footprints resulting from petroleum exploration and exploitation.

1.2. Statement of the Problem

As stated earlier, research studies have shown that petroleum is migratory in nature[3] and that it can be found in traps of reservoirs straddling across different artificial land boundaries at the same time.[4] This is irrespective of the land tenure system and it's artificial boundaries in operation at any material time.[5] The land tenure system in Nigeria, which has been in existence long before Nigeria came into being, recognizes the fact that the customary ownership rights of individuals and communities can transcend beyond the artificial boundaries of States/federating units constituting the Federal

1 Isaac Olson, New Challenges to Transboundary Unitisation in the Gulf of Mexico. *6 Tex. A&M J. Prop. L. 85 (2020) 524;* DOI: https://doi.org/10.37419/JPL.V6.I4.4]
2 Ibid.
3 Phoebe Ruth Parson, I*nformation Requirements in Natural Resources Law: Geothermal, Fisheries and Petroleum Compared, (A thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy at The University of Waikato, 2022)* p. 22
4 Bruce M. Kramer and Patrick H Martin, Williams & Meyers, Oil and Gas Law, (.LexisNexis, 2010) at 910.
5 Ibid.

Republic of Nigeria. This means that individuals, communities and other legal entities can own and exercise land ownership rights across state boundaries, even though petroleum resources which straddle different fields are usually unitized and mainly extracted without regards to any surface ownership boundaries, for instance, between and amongst various communities, sub-federating units etc.[6]

The problem in the above scenario can be graphically painted, thus: Community "A" in State "B" can be the customary communal owner/host of an oil and gas facility/well(s) in neighbouring State "C". While Community "A" may not have any constraints accessing and being recognized by the operator/licensee on ground as the host community in demanding for surface tenement rates and other legal entitlements from the operator, pursuant to relevant provisions of the Petroleum Industry Act (PIA) 2021 and other enabling statutes,, more often than not, Community "A" cannot even access the constituted state authorities of State "C" for purposes of demanding a share of the 13% Derivation Funds for its developmental purposes. State "C", too, does not feel any legal obligation towards Community "A", a Community which is ordinarily not located within the geographical boundaries of State "C". The worst case scenario is that, though Community "A" is an oil producing Community contributing to the coffers of the Federation and that of State "C", it usually suffers the injustice of not being officially recognized as an oil producing community in both States "B" and "C". This invariably means that Community "A" may also suffer the additional injustice of being denied developmental projects from the Oil Producing Areas Development Board of State B, its own state. Technically, Community "C" is a stateless host community.

This is the nature of the problem facing Ojobo Community and many other Communities which has caused a great deal of conflicts in many oil producing Communities and states, including the age-long crisis in the Benisede Flow Station (between Bayelsa and Delta States),[7] Ohaji Fields (between Bayelsa and Rivers States), Soku Field (between Bayelsa and Rivers States) just to mention a few. This problem is caused and/or compounded by a number of factors such the amorphous federal structure in Nigeria where host Communities are divested of the ownership, control and management of natural resources in their domains, the application of vertical laws in a horizontal system where licensees and licenesses are required by law to unitize fields in the event of petroleum deposits straddling across different fields.[8] This is to be done without any regard to any surface artificial boundaries created by the populace. In exercise of this mandate and in line with the so-called international best practices in the oil and gas Industry, operators can employ the use of horizontal drilling and/or tie back wells from one federating units to another or unitized fields for the purpose of ensuring optimum recovery of petroleum from a petroleum reservoir.[9] All these are practices that capable of adversely affecting the proprietary or pecuniary interests of various stakeholders as far as the application of the constitutionally guaranteed 13% derivation fund is concerned.

1.3 Significance of the study

This study draws our attention to the question: where crude oil is found in communal lands across state borders in the Federation of Nigeria but outside the official boundaries of the state where the community belongs, what is its fate regarding benefiting from the 13% derivation fund and the 3% trust funds as a potential host community? Thus, the purpose of this study is to formally bring to the attention of the public, particularly policymakers, legal researchers and the National Assembly concerning the existence of a fundamental problem facing a host of oil producing Communities in Nigeria which has been lingering over the decades. It is a recondite

6 Ibid.

7 https://www.gbaramatuvoicenews.com/ojobo-demands-equity-in-spdcs-beneside-flow-station-operation-watch-video/; https://dailywatchng.org/breaking-ojobo-community-shuts-down-benisede-flow-station-over-mou-failure/; accessed on 10th January 2023 at 11:30 hours GMT.

8 S. 80 (2} of PIA 2021

9 Ibid.

issue of law which resolution will contribute to bringing about some form of lasting peace in very many Communities in the Niger Delta. While the agitations[10] for the upward review of the 13% derivation fund and its judicious application by the Governors for the benefit of host communities are ongoing, this study brings to the fore that there are another class of host communities that are facing the double tragedy of not being recognized as host communities in the first place much less the benefits of the 13% derivation trickling down to them.

2.0. **METHODOLOGY**

10 Lysias Dodd Gilbert, Kenneth Gwedianannie Amos, Rufus Anthony, "Corruption and the Utilization of 13% Oil Derivation Fund in Bayelsa State of Nigeria", *Internl. Journal of African and Asian Studies www.iiste.org Vol.13, 2015, 152*

1.3 Scope of the study

Ojobo is the main host community to the oil facilities known as the Benisede Flow station in OML 35 being operated by the Shell Petroleum Development Company of Nigeria (SPDC) Nigeria Limited.10 Though, Ojobo is used as the case study in this research, the issue under the spotlight is a problem that is not peculiar to Ojobo Community alone but cuts across many communities in Nigeria, particularly in the Niger Delta where the bulk of Nigeria's petroleum resources are found and exploited. While Ojobo, the case-study here, is a community in the Burutu Local Government Area of Delta State, having all its oil wells in ancestral lands belonging to it but are located in Bayelsa State, the reverse is the case for Ayamassa, a community in the Ekeremor Local Government Area of Bayelsa, having petroleum deposits exploited by AGIP10 which are located in the Burutu LGA of Delta State. Again, Biseni in the Yenagoa Local Government Area (LGA) of Bayelsa State is another example. having its oil wells that are part of the Ohaji Field in Rivers State; others include Oluasiri community in the Nembe LGA of Bayelsa State, having oil wells located in Rivers State and are tied back to the Soku Field in Rivers State etc. The study, therefore, covers four key petroleum host communities in the Niger Delta.

2.1 Background to the study

Ojobo is an Ijaw community in the Burutu Local Government Area of Delta State. Ojobo is located at Lat. 05 01' 49" N and Long. 05 40' 30"E and situated along the right bank of Bomadi Creek, a distributary of the River Forcados of the Niger Delta maze of distributaries.[11] The community was founded in the 14th century by an ancestor called Gbesa, a migrant hunter and fisherman whose roots are in the Bayelsa State of Nigeria.[12] Specifically, he was paternally from Otuokpoti town (in the current Ogbia Local Government Area of Bayelsa State)[13] and maternally from Oporoma town, the headquarters of the present-day Southern Ijaw Local Government Area of Bayelsa State. Ojobo community owns and exercises undisputed customary rights of ownership and occupancy over vast territories and lands straddling both Delta and Bayelsa States in the Federal Republic of Nigeria.[14] The community has been the main host community for the Benisede Flow Station, an oil facility, which is being operated by Shell Petroleum Development Company (SPDC) since the early 1970s when crude oil was discovered in commercial quantities in the area. The Benisede Flow-Station, which is geographically located in the Ekeremor Local Government Area of Bayelsa State, is even named after "Benisede", one of the communal deities of Ojobo town. Out of the 21 oil wells servicing the station or rather, from which crude oil is being exploited for over 40 years now, **16** of them are "owned" and located in territories where Ojobo enjoys undisputed customary occupancy and ownership of the lands in Bayelsa State. It is also noteworthy to add that prior to the creation of Rivers State in 1967 and the subsequent boundary adjustment exercises between the defunct Bendel State and Rivers State, the geographical area covering the two local government areas (Sagbama and Ekeremor,

11 Aperebo GC, Memoirs of Ojobo Community, (Gabriel Nig. Ltd. 2003) 2

12 Arumuna JI, A Short History of Otuokpoti, (Treasure Resource Communications Ltd, 2019) 55. See generally, Aperebo G, Memoirs of Ojobo Community, (Gabriel Nig. Ltd, 2003) at 1-3.

13 Ibid.

14 Aperebo, op cit. at 2-4.

including the location of Benisede, now in the present-day Bayelsa State) were originally in Bendel State alongside the host community, Ojobo. After the national boundary adjustment exercise, Benisede was ceded to Rivers State (now Bayelsa State), leaving only the host community to be on the side of Delta State. The central focus of this research is an examination of the challenges of host communities like Ojobo located in a federating unit (State) which is different from the state of localization of the mineral resources which are still within its ancestral domains.

2.2 Method

The study is a doctrinal research which employs a qualitative approach rooted in case-study tradition.

4.0 DISCOURSE

4.1 The Concept of Statelessness

The term "statelessness" is a well-known concept in International Law.[15] It encapsulates a situations where a stateless person is described as someone who, under national laws, does not enjoy citizenship – the legal bond between a government and an individual – in any country. While some people are de jure, or legally stateless persons (meaning they are not recognized as citizens under the laws of any state), many people are de facto, or effectively stateless persons (meaning they are not recognized as citizens by any state even if they have a claim to citizenship under the laws of one or more states.[16] A number of factors may engender a stateless situation, including political change and transfer of territory, which may alter the nationality status of citizens of the former state(s).[17] Without citizenship, stateless people have no legal protection and no right to vote, and they often lack access to education, employment, health care, registration of birth, marriage or death, and property rights. Stateless people may also encounter travel restrictions, social exclusion, and heightened vulnerability to sexual and physical violence, exploitation, trafficking in persons, forcible displacement, and other abuses.[18]

In this study, statelessness is adapted from the sphere of international law and used here to depict a situation where a petroleum host community in Nigeria, though obviously located within the geographical space of a given federating state in Nigeria, is, nevertheless, regarded as a stateless host community on the basis of its peculiar location vis-a-avis the location of the petroleum resources within its ancestral domains. It is trite that Nigeria is made up of thousands of Communities and clans belonging to various states and local government areas. These communities and clans that straddle the length and breadth of the nation have been in existence long before the coming into existence of the entity called Nigeria. However, through the evolution of the nation, these organically unique communities and clans have been balkanised into different tiers of Government. One core consequence of the splitting of ethnic and clan units into smaller groups in the form of states in the federation over the years is that communities which ordinarily exercise customary communal rights over vast parcels of land have been excised from states where such lands are located. In the end, their legal and equitable rights to benefit from resources in such excised landscapes are either curtailed or denied totally. Such Communities do not enjoy being host Communities of oil and gas facilities for all intents and purposes simply because they are now found in states different from the states they exercise customary ownership rights. Put differently, Community "A" owns a vast parcel of land where it has exercised customary rights of ownership from time immemorial by way of fishing, farming, hunting etc. Suddenly, there was a state creation exercise by the military at the time or by any other constituted authority (as was the case in the creation of the Midwestern State) and the community in question finds itself

15 See generally, the 1948 Universal Declaration of Human Rights, Art. 15; the 1954 Convention Relating to the Status of Stateless Persons; 1961 Convention on the Reduction of Statelessness; the 1966 International Covenant on Civil and Political Rights, Art. 24 ; 1961 Convention on the Reduction of Statelessness; 1966 International Covenant on Civil and Political Rights, Art. 24 etc.

16 US Department of State, Statelessness, https://www.state.gov/other policy issues/statelessness/#:~:text=What%20Does%20It%20Mean%20To,an%20individual%20%E2%80%93%20in%20any%20country.

17 Ibid.

18 Ibid.

in a state different from the state where its vast ancestral land is located, what is the fate of that community in respect of the 13% Derivation Funds accruing to the other state where the community has a transboundary customary right of ownership? What is the fate of such a community for purposes of benefitting from the 3% trust fund for host communities established by the PIA?

There are many communities in the Niger Delta caught in this quagmire and the political structure and extant laws of the land do not seem to provide a solution to this issue which is at the root of some of the conflicts in the Niger Delta. This age-long issue is affecting not only Ojobo Community but many other oil producing Communities in the Niger Delta. It is the same problem that is at the root of the conflicts between Oluasiri (in Bayelsa) and Soku (in Rivers State), Biseni (in Bayelsa) and Ohaji (in Rivers State), just to mention a few.

Now, concerning the rights of natives for compensation for land across State boundaries, case-law is replete with authorities. Remarkably and notably, in the case of *Nkuma v. Odili*[19], the Supreme Court of Nigeria upheld and echoed the judgment of the Court of Appeal, particularly the concurring judgment of Pats-Acholonu J.C.A. (as he then was), thus:

> "*The singular issue that agitated the mind of the appellant seems to focus on the decision of the court below that the Respondent being a native of Ndoni in Rivers State should not be entitled to compensation in respect of the land adjudged to be situate in Imo State. I believe that Nigerians are carrying the issue of Statism to a ridiculous extent. It must not be forgotten that before the Nigerian Civil War, Ndoni was in Eastern Nigeria and therefore an Ndoni man who owned a piece of land now situate in Oguta Local Government Areas does not cease to be the owner simply because the creation of a State puts him in a different area. If A is ordinarily resident in one State and acquires land in another State which now produces oil or gas or other mineral in that other state, no one in his right senses could question his right to due compensation.*
>
> *The right of compensation that was found due to the Respondent was from the finding that he made a better case than the appellant as he controls the land and exercises the necessary animus possidendi".*

Thus, by virtue of the proviso to section 162 of the Constitution of the Federal Republic of Nigeria 1999, oil-producing States are entitled to be paid at least, 13% of the revenue accruing to the Government of the Federation from petroleum deposits located within a particular state. For all intents and purposes, this 13% derivation is more or less a compensation to such States to bring about sustainable development of the host communities bearing the brunt of the petroleum operations.[20]

It is our contention that the derivation funds payable to oil-producing States in Nigeria as constitutionally enshrined is a species of the compensations envisaged in the above case. The statutory framework of oil and gas cuts across the ownership, control, operation of oil and gas in Nigeria, and there is a plethora of legislation governing the oil and gas industry in Nigeria.

The Constitution of the Federal Republic of Nigeria, 1999 (as amended), the Exclusive Economic Zone Act, Petroleum Industry Act (PIA) 2021 and other laws vest the exclusive control, ownership, and management of oil and gas in the Government of the Federation. This means that the oil and gas resources are held in trust by the Federal Government on behalf of the other tiers of government, that is, for the citizens of Nigeria for their overall benefit and development of the country under the prevailing laws.[21]

This paper strenuously argues that host communities should not be denied of the benefits of the 13% derivation funds irrespective of whether the host community which is the ancestral or customary owner of the land where

19 (2006) 5 MJSC 1 at 24 para. A-F

20 S. C. Odoh, "Rethink of The Implementation of Environmental Justice in Nigeria", Unizik, Law Journal 18, 2022 At 32.

21

the oil well and other facilities are located is actually situated in a federating unit (state) other than the state receiving the 13% derivation?

It is no longer an issue subject to any shred of debate that oil-producing States in Nigeria, over the decades, are entitled to receive from the Federation Account under the 13 per cent derivation principle. The huge sum notwithstanding, the Niger Delta region is still suffering from massive infrastructure decay, widespread poverty and environmental degradation, among numerous others. The 13 per cent derivation fund has been a subject of controversy between the oil-producing communities and their various state governments, with the former asking the Federal Government to stop paying the money directly to the communities and not into the coffers of the state. This is on account of the recipient state governments diverting funds meant for the development of such host communities.

Black's Law Dictionary defines compensation, thus:[22]

"1. Remuneration and other benefits received in return for services rendered; esp., salary or wages.

"Compensation consists of wages and benefits in return for services. It is payment for work. If the work contracted for is not done, there is no obligation to pay. [Compensation] includes wages, stock option plans, profit-sharing, commissions, bonuses, golden parachutes, vacation, sick pay, medical benefits, disability, leaves of absence, and expense reimbursement." Kurt H. Decker & H. Thomas Felix *II, Drafting and Revising Employment Contracts* § 3.17, at 68 (1991).

> 2. Payment of damages, or any other act that a court orders to be done by a person who has caused injury to another."

Odje submits, and we concur with him, that the principle of derivation is a recompense for sequestered rights and/or interests.[23] The principle of derivation as enshrined under the proviso to Section 162 (2) of the 1999 Constitution, as amended, is geared towards providing a recompense to the producers of any natural resources for the expropriation and sequestration of their rights to control and manage same, by the Nigerian State. Therefore, we argue that the derivation in question is a compensation to the host states and the host communities and the latter cannot and should not be discriminated against or be denied of same by virtue of the peculiar location of such host communities. Thus, the laudable principles elucidated in the case of *Nkuma v. Odili*[24] should apply mutatis mutandis to the legislative intendment of the proviso to section 162 (2) of the Constitution without discrimination.

The cardinal plank upon which the 13% derivation can be effected is through a Revenue Allocation Act as provided under Section 162 (2) above. A Revenue Allocation Act, is the constitutional medium through which approved appropriations are guaranteed for the benefit of the various tiers of Government.[25] Instructively, it is also through a Revenue Allocation Act, that the 13% derivation can be provided for and implemented as well in the circumstances.[26] The hallowed principle of law is encapsulated in the Latin maxim, *ubi jus, ibi remedium*, that is, where there is a wrong there must be a remedy.[27]

4.2 Host Community Development under the PIA 2021

Notwithstanding the fact that the host communities want more from the environmental effects of oil operations, in the light of all the agencies participating in Niger Delta

22 Bryan A. Garner (ed.) Black's Law Dictionary (9th edn.), (West. a Thomson business, 2009) 322

23 Odje A.M., (2016) 13% Derivation, Falling Crude Oil Pr ice and the Constitution, http//www.vanguardng.com/2016/02/13-derivation-falling-crude-oil-prices-and-the-constitution

24 supra

25 See generally, *AG of Bendel State v. AG of Federation & Ors. (1981) 3 NCLR I*

26 It is indeed much easier to increase the percentage of derivation through a Revenue Allocation Act than through a constitutional amendment. Accordingly, that was why the proviso to Section 162 (2) thereof, provides that in any Revenue Allocation Formula adopted by Parliament, NOT LESS THAN 13% should be set aside as reflecting the principle of derivation.

27 *Promasidor (Nig) Ltd & Anor V. Asikhia (2019) LPELR-46443(CA)*

development, the government considers that adequate measures would be provided in this regard under the regime of PIA. Therefore, Chapter 3 of the Act is focused on Petroleum Host Community Development ('PHCD'). Its key objective is to encourage sustainable development and prosperity within host communities, provide host communities with direct social and economic benefits from oil operations, ensure harmonious coexistence between licensers or leasing parties and host communities and to establish a framework to facilitate host community growth. This chapter is generally aimed at increasing the quality of life of the host communities.[28] However, there is no running away from the fact that PIA is a holistic legislation intended to provide far-reaching solutions to crucial issues in the Petroleum industry in Nigeria, including lingering issues affecting the host Communities such as environmental deprivation, widespread poverty etc. The PIA is specifically intended to take care of all subsisting problems in the oil and Gas industry in Nigeria today. Now, the whole of Chapter Three of the Act is for Host Community Development.[29] The question now is: does the Act, as currently enacted, take care of the age-long grievances of such stateless host communities? No. There is no provision in the PIA or in any other enacted law in Nigeria which recognises the existence of trans-state boundary communal customary rights for purposes of the Community in question benefiting from the 13% Derivation Funds as a host Community to oil and gas facilities. If a bulky law like PIA does not make provision for it, where would provision be made for it? The PIA as currently constituted cannot and has no provision to address this fundamental and lingering problem. The issue of the failure of recognising trans-state boundary communal customary rights, it is recommended, should form the plank for an appropriate legislative amendment. Where there is a wrong, there must be a remedy. And the National Assembly has a constitutional duty to legally provide the remedy by way of an enabling clause in the PIA or through a constitutional amendment.

28 s. 234 of PIA 2021.
29 See sections 234-257 of PIA 2021.

4.3 Implications of the findings

One fundamental implication of the findings is that a community can be an oil and gas producing community in Nigeria but may suffer the injustice of not being recognised by federating state actors as a host community in their states simply because the wells in question fall under the geographical boundaries of a state other than the one where the said host community is situated. Consequently, the community will be unduly denied of developments in a number of ways. First, being an orphaned community, it will have no opportunity of being developed with 13% derivatives. Second, where the said orphaned community is located in a state with its own Oil and Gas producing development board, the community will also be denied of developmental drives in that direction. Its indigenes may not have any legitimate claim to be appointed to such boards since it is a board for communities recognised by the state as oil and gas producing. This is exactly the plight of Ojobo community in Delta State and this is the gravamen of this discourse and indeed, too, the hub of the matter at hand.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This study examined the recondite issue of stateless host communities in the oil and gas map of Nigeria. The study found that, though the customary land tenure system in Nigeria recognizes the fact that a community in one federating state can be the customary owner of a piece of land in another state within the federation, and such a community can benefit from the current Host Community Development provisions under PIA, the extant legal framework in Nigeria makes no provision for such Community or Communities to benefit from the 13% derivation funds paid monthly to petroleum-rich states where the community in question is located in a state different from the state where the Petroleum Resources are located. This ugly situation has also contributed in its own way to the intractable conflict in the Niger Delta. The current constitutional framework does not only undermine the age-long customary land tenure system but also the

recommendations of various national boundary adjustment commissions, thus denying such boundary communities of rights and privileges accruing to them from Petroleum Resources found in their ancestral domains but located in another state. The issue of host Communities benefitting from the 13% derivation fund is crucial because the chunk of the funds channelled out for the development of petroleum host Communities is through this constitutional 13% and not through the meagre 3% provision under PIA. This problem which has lingered for a long time is not addressed by the PIA itself which is considered as a comprehensive legislation to deal with every knotty issue in the oil and gas industry in Nigeria.

5.2 Recommendations

Where there is a wrong, there must be a remedy. Against that backdrop, the study recommends that urgent steps should be taken by policymakers, particularly the Federal Government through the National Assembly, to bring about the desirable constitutional and legislative amendments in order to find a lasting solution to this lingering injustice. This could be either by way of creating a special fund for such stateless communities or grafting their developmental needs as part of the responsibility of the state directly benefiting from resources in the domain of such host Communities, in a proportion envisaged by the derivation Principle in the Constitution.

IMPARATIVES OF INCOME SMOOTHING AND QUALITY OF REPORTING OF LISTED BANKS IN NIGERIA

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Abstract
This research work focused on the Imperatives of Income Smoothing account and quality of Reporting of Listed Banks in Nigeria. Creative accounting, window dressing, are used as dimensions of income smoothing account while relevance, understandability and faithful representation are used to measure quality of reporting. The study applied ex-post facto research design. Two research questions were raised for the study and two hypotheses were formulated. The statistical package for social science (SPSS) was used to test the hypotheses. The result showed that there is positive and correlative relationship between income smoothing account and quality of Reporting of listed Banks in Nigeria. The study therefore, among others, recommended that there should be one set of global financial reporting standard by all operators of financial statements which must be effectively monitored. More emphasis should be laid on the review of the standard.

Keyword: *Income smoothing, relevance, window dressing, creative accounting.*

1.0 INTRODUCTION

Financial performance is vital in every firm as it helps keep in check the financial progresses and a goal as it comes in form of financial statements. These statements are considered as organized and logical financial data collections for the sole purpose of conveying an understanding of the financial aspects of the organization. This is analyzed in the statement of financial position or the income statement which further shows the summary of an organization's business revenue or loss over a given period of time. With the changing business environment, organizations need to do all they can to compete firmly and make profit, bearing in mind that several challenges could question their existence and this is where creative accounting comes in as regards decision making (Child, 2020). Although creative accounting has received a great deal of attention in recent times in Nigeria, which has made it an area of research, it is very much prevalent among companies. There are many reports of price manipulation, profit overstatement, and accounts falsifications by some fraudulent and dubious stewards which render financial reports ineffective (Ezeani, 2012).

Quality of financial statement, according to Griffith (2016), are those distinguishing characteristics or attributes that make information provided in financial statement useful to users. Financial statement provides shareholders with information on entity's financial position, performance and cash flow by providing information about its assets, liabilities, equity, income and expenses, changes and cash flows. Financial statement provides information that is used by interested parties to assess the performance of the manager to make economic decisions. On this note, users may assume that the financial information they receive is reliable to fit its purpose. Accordingly, regulations attempt to ensure that information is produced on a consistent basis in accordance with set of rules that make it reliable to users. However, communication between entities and shareholders may be deliberately distorted by the qualities of financial statement prepared, to alter or make it appear effective and reliable. This type of distortion is often referred to as creative accounting (Griffith, 2016).

Aims and Objectives of the study

The aim of this study is to examine the Imperatives of Income Smoothing account ON quality of Reporting of Listed Banks in Nigeria. The specific objectives of this study are to:

i find out the effect of creative accounting on faithful representation of financial statement.
ii examine the relationship between window dressing and relevance of financial statements.

The following hypotheses are formulated for testing.

Ho1: There is no significant effect of creative accounting on faithful representation of financial statements.

Ho2: There is no significant relationship between window dressing and relevance of financial statements.

2.0 LITERATURE REVIEW

This part deals with review of related literature bothering on: **Conceptual Framework, Theoretical Framework and Empirical Review.**

2.1 Conceptual Framework

Income smoothing: Accounting regulations often permit a choice of policy for example, in respect of asset valuation (International Accounting Standard permits a choice between carrying non-current assets at either revalued amounts or at depreciated historical cost). Business entities may, quite validly, change their accounting policies and figures in order to make it look meaningful in the eyes of the public. Such changes may be relatively easy to identify in the year of change, but are much less readily discernible thereafter. Quality of corporate financial statement is the characteristics that make the information provided in financial statements useful to users (Watts & Zimmerman, 2019). Razaee (2018) asserts that an organization is considered effective when it is making profit, and this profit can be seen in its statement of financial position. Also, Sanusi and Izedonmi (2014) believe that an effective organization would meet the goal of increase in market shares. Quality of financial statements is the distinctive features of financial statements that make it acceptable by shareholders and stakeholders. Thus, the main qualitative characteristics of financial statements are relevance, faithful representation, understandability and comparability. The practice of creative accounting has the power to distort the underlying financial performance of a firm, by making it more difficult for an investor or financial analyst to assess the performance of the firm and to compare between similar banks or companies. Various studies indicate that company management may resort to the distortion and manipulation of financial numbers or figures through the use of creative accounting tools such as income smoothing, window dressing, off statement of financial position transactions which are readily available to play financial numbers games that would enable them produce financial statements that would meet the expectations of the shareholders and other interested parties.

Creative Accounting

The potentials of creative accounting are found in six principal areas of: income smoothing, reclassification of transaction, off statement of financial position financing, faithful representation, understandability and finally relevance in the presentation of financial statements. Even in a highly regulated accounting environment such as the USA, a great deal of flexibility is available (Mulford & Cosmiskey, 2019). According to Graffith (2016), the following are the techniques of creative accounting:

Faithful Representation: The information contained in the financial statement must be free from material error and bias, and not misleading. Thus, the information should faithfully represent transactions and other events, reflect the underlying statement manipulation in order to make the information relevant to the needs of the users, which is the case when the information influences the economic decisions of users. This may involve reporting particularly relevant information, or information whose omission or misstatement could influence the economic decisions of users.

Relevance: In accounting, the term "relevance" means that financial statements would make a difference to a decision maker. Relevant information is capable of making a difference in the decisions made by users. It is capable of making a difference in any decision if it has predictive value, confirmatory value or both. Predictive value helps users in predicting or anticipating future outcomes. Confirmatory value enables users to check and confirm earlier predictions or evaluations. For example, in the decision to replace equipment that has been used for the past six years, the original cost of the equipment does not have relevance. In other words, the original cost is irrelevant in the

decision to replace the equipment. What would have relevance are the future amounts, such as the cost of the new equipment and the savings that would occur when the old equipment is replaced. In order to have relevance, accounting information must be timely. Financial statements issued three weeks after the accounting period ends would have more relevance than financial statements issued several months after the period ends. Having timelines and relevance may mean sacrificing some precision or reliability. The relevance of information is affected by its nature and its materiality.

Window Dressing: This refers to the company's decision to dress up financial statements for potential investors and creditors. The goal of this is to attract new supporters by having financial statements look like the company is doing great. The company needs to appear to have a history of been profitable, even if it means covering profit in one accounting period to increase profit in another. Even though it seems fraudulent, it is not overall, the company is still reporting the same amounts of profits, but is spreading the amount evenly over a specific time period

2.2 Theoretical Framework

The theories employed for this work are:

Agency Theory: Agency theory according to Madan (2016) is the theory that explains the relationship between principal (shareholders) and agents (managers). In this relationship, the principal delegates or hires an agent to perform work in the best interest of the principal. The delegation of decision-making authority can lead to a loss of efficiency and can subsequently increase costs. For example, if the owner (principal) delegates decision making authority to the manager (agent), it is possible that the manager would not work as hard as the owner would, given that the manager does not share directly in the results of the organization. This could lead to the agency problems because the theory involves cost of resolving conflict because of the principal, agents and aligning interests of the two groups. It usually leads to risk aversion which is caused by the relationship between risk and return (Dechow & Skinner, 2020). The agent in such a relationship will do everything possible to ensure that principal that employed him is happy, through falsification of reports in order to justify his position and activities delegated to him. This is known as window dressing. As a result of this window dressing of the financial statement, ethical standard in financial reporting is often significantly desecrated (Gladson & Ahiazu, 2017). In fact, researchers like Beatty (2017); Bora and Saha (2010) challenged the ethical stance of both shareholders and managers in the use of such practices in any organization. This is because there are many reports of price manipulations, profit overstatement, and accounts falsification by some dubious stewards which renders financial statements ineffective. The business failure of the past decades however, have been closely associated with a number of parties, managing board of directors, auditors and some investors (Ezeani, 2012). The relevance of the agency theory to this work is that accountants at times corroborate with management either to increase or decrease the financial statement. The differences which are observed in financial reporting are legitimately prepared from choice of varied accounting policies of the same organization of the same period, has brought about challenges of credibility to accounting. This is because when the secret reserves are created, it actually means that agents are not providing good information to shareholders or asking managers about any suspicious account or dubious transactions.

Value-based management theory: This is the management theory that states that management should consider the interest of shareholders first in its business actions. Madan (2016) states that value-based management encompasses the processes used for creating, managing and measuring value. It is simply the theory that applies only when company invests capital at a return that exceeds the cost of that capital. This means the organization embraces value maximization as the ultimate financial objective for the company. They do so by employing four management processes of: **Strategy development:** First, company or business unit develops a strategy to maximize value. **Target setting:** Next is the translation of strategy into short and long-term performance targets. These are defined in terms of key value drivers. **Action plans and budgets:** This is another step to develop action plans and budgets to define the

steps that will be taken over the next year to achieve the stated targets. **Performance management:** this is the institution of performance measures and incentives system in place to monitor performance against targets and to encourage employees in meeting their goals because the interest of shareholders is considered first, managers try to dress the financial statement in other to make it attractive and meet the needs of shareholders who are the major users.

2.3 Empirical Review

Sanusi and Izedonmi (2014) questioned senior corporate auditors about their experiences of creative accounting. From their findings, they concluded that a significant proportion of all categories of companies employ creative accounting techniques to some extent. Madan (2016) modeled the discretionary component of bad debt provision in order to identify the discretionary elements of accruals. Bennis (2017) discussed the class of income smoothing with the use of extraordinary items, with results based on the study of 62 US companies, indicate that income smoothing does take place. A later large scale of study of classifying income smoothing (Dempsey, Hunt & Schoeder, 2017) found that managers showed a propensity to report extraordinary gains on the financial statement and extraordinary losses on the retained earnings statement. Moreover, this research found that the propensity to report in this way was significantly greater in non-owners managed firms. Dascher and Malcom (2015) analyzed data over several years for 52 firms in the chemical industries sector relating to four income smoothing variables: pension cost, dividends from unconsolidated subsidiaries, extraordinary charges, credits and research and development costs. They concluded that their results were consistent with the hypothesis that deliberate smoothing had taken place and that large provisions against uncertain levels of future loss are highly dependent upon the judgements made by management. Watts and Zimmerman (2019) cited several studies that found "compelling evidence" of income smoothing via accruals in banks and insurers. Tassadaq and Malik (2015) examined management manipulation of accounting information within two firms (internal and external) and drew up both interviews and questionnaires data. The research found that managers acknowledge manipulative behaviours and short-term presentations. Black, Seller and Manly (2017) examined non-current asset sales as creative accounting tools, using a very large data set of observations from Australia, New Zealand and United Kingdom. They found that where the relevant accounting standards are permissive, managers would exploit the potential for creative accounting via timing of asset sales. Such behaviours are curtailed once the provisions of accounting standards are tightened. However, amongst their conclusions, they observe that there is every reason to believe that firms can shift creative accounting activity among a variety of methods. So, even if, certain loopholes in regulation are eliminated, creative accounting behaviour is likely to persist.

3.0 METHODOLOGY

This study adopts economic study design which would utilize the primary data collection for five consecutive years from 2016 to 2020 available from the study of population through the information in their reported financial statement at the Nigeria Stock Exchange. Under the design, the data related to the variables are all collected from the financial statement of the same financial period. The statistical and mathematical tools to be used include percentages, frequencies, tabulation, and descriptive statistics while multiple regression analysis is used to test the hypothesis generated in this work in the introduction section. The multiple regression model is guided by a linear model.

1. $y = f(\text{IS, WD, CA})$ ……1a
2. $x = f(\text{RE, FR, UD})$ ……2a

Where:
RE = Relevance;
FR= Faithfulness representation;
UD = Understandability
IS = Income smoothing;
WD = Window Dressing;
CA = Creative Accounting
μ_0. β_0, a = Intercept and μ_1–μ_2. β_1–$\beta_{21.5.1}$.
However, the model is tested using the diagnostic tests of heteroskedasitcity, serial

correlation, normality and misspecification (Gujarati & Porter, 2009). Econometric view (Eview) is applied in the analysis of data. E-views reports p-values which can be used as an alternative approach in assessing the significance of regression coefficients. The p-value shows what is the smallest level at which we would be able to accept the null hypotheses of a test. We use a 5% level of significance; hence we conclude that the coefficient is significantly different from zero at the 5% level if the p-values is less than or equal to 0.05. If it is greater than 0.05 then we cannot reject the null hypothesis that the coefficient is actually zero at our 5% significance level.

4.0 DATA PRESENTATION

Bivariate Analysis

This shows the level of association between employed variables and the direction of movement amongst them. The Table 4.1 below is extracted from the SPSS statistics 20.0 outputs

Table 4:1 Extract of the correlation matrix of the explanatory and response variables

Variables	RE	AD	UD	Sig.
IS	.960**	.985**	.973**	.000
OB	.984**	.968**	.980**	.000
WD	.987**	.951**	.969**	.000

** Correlation is significant at the 0.1 level (2 tailed).

*Correlation is significant at the 0.05 level (2 tailed)

The above Table indicates a positive and significant correlation amid income smoothing accounting and quality of reporting of listed banks in Nigerian. Judging by the positive output of .960; .984; .987 for Reliability, .985; ,968; .951 for adequacy and .973; .980; .969 for understandability all at 0.000 significant level between window dressing and the criterion variables – Faithful representation, Adequacy and understandability of financial statements which is less than 0.05 level of significance. This signifies that the faithful representation, Adequacy and Understandability of financial statements are meaningfully influenced by independent variables – window dressing, creative accounting and reclassification of transactions. Also, there is an existence of positive relationship. Summarized as an increase in predictors – income smoothing, creative accounting and window dressing are likely to change faithful representation, Adequacy and Understandability of financial statements.

Multiple Regressions

The study further moves to find the influence of the predictors on the criterion by carrying out regression exercise as displayed in Table 4.2 which is a summary of the model estimate extracted from the SPSS static 20.0 output.

Table 4.2: Extract of the Model Estimates

$IS = \beta_0+\beta_1RE+\beta_2U+\beta_3AD+\varepsilon$

Variables	R	B	t	Sig.
RE	.960	.960	36.281	.000
UD	.973	.973	44.556	.000
AD	.985	.985	61.522	.000
$CA = \beta_0+ \beta_1RE+ \beta_2U+ \beta_3AD + \varepsilon$				
RE	.984	.974	45.946	.000
UD	.980	.984	58.801	.000
AD	.968	.987	65.944	.000
$WD = \beta_0+\beta_1RE+\beta_2U+\beta_3AD+ \varepsilon$				
RE	.987	.928	26.426	.000
UD	.969	.978	49.300	.000
AD	.951	.828	15.679	.000

Hypotheses Testing

Hypothesis one

Hypothesis one states that there is no significant effect of creative accounting on faithful representation of financial statement.

From the analysis above creative accounting (B= .960, t=36.281, sig.000) positively and significantly relate to reliability of financial statements. The significant level of 0.000 is less than 0.05% significant level. The null hypothesis was rejected and the study concluded that there is a significant relationship between creative

accounting and faithful representation of financial statements.

Hypothesis two

Hypothesis two states that there is no significant relationship between window dressing and faithful representation of financial statements.

From Table 3.3 above window dressing (B = .987, t = 65.944, Sig.000) has positive and significant relationship with adequacy of financial statements. The significant level of 0.000 is less than 0.05% significant level. The null hypothesis was rejected and the study concluded that there is a significant relationship between window dressing and adequacy of financial statements.

Discussion of findings

Hypothesis One

There is no significant effect of creative accounting on faithful representation of financial statement.

Creative accounting uses deceptive technique to level out fluctuations in net income from one period to the next. This shifts revenue and expenses in reporting period that does not affect the financial statement presented to public (Child, 2020). Corporate managers indulge in the practice of creative accounting to dampen fluctuations in their firms publicly reported net income. One reason given for this is that managers think investors pay more for a firm with smoother income stream.

Graffith (2016) argues that firm's level of transparency could affect equity and debt differently and at the same time is not affecting the extent of firm's faithful representation of financial statement. He mentioned that earnings smoothing is likely to be a particular issue given the importance of shareholders and stakeholders who believes that it pays more with smoothed income stream, without knowing it decreases the debt cost of capital that does not affect the true state of the firm but beautifies it. He went further to give example of income smoothing technique to include deferred revenue during good year, if the following year is expected to be a challenging one or delaying the recognition of expenses in difficult year because performance is expected to improve in the near future, that does not affect the true state of the firm.

Hypothesis Two

There is no significant relationship between window dressing and relevance of financial statement.

Window dressing has been defined as the funding or refining of a company's operations in such a way that under legal requirements and existing accounting conventions, some or all of the finance may not be shown on its statement of financial position. The term window dressing usually used to describe those transactions which meet such objectives. Beatty (2017) defined window dressing as the performance, that represents items that are effectively asset or liabilities of a company but do not appear on the company's statement of financial position. The general idea for window dressing is that anyone else looking into the company and their statement of financial position would understand it without seeing the negative liabilities. Dabor and Weintron (2015) also defined window dressing as an accounting scandal that is used to hide figures in form of debt that cannot be repaid.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Income smoothing is one of the important issues common in preparation of financial statements by corporate entities that entails the use of creative accounting, window dressing and off-statement of financial position financing. The purpose of this research was to test the imperative of income smoothing accounting and quality of reporting of listed banks in Nigeria. Analysis from the sampled banks using the ordinary least square and coefficient of variation method revealed that there is a significant relationship between creative accounting and faithful representation of financial statement, as well as between window dressing and relevance of financial statement.

5.2 Recommendations

Based on the findings, the following are therefore recommended:

i. To discover and prevent the danger of creative accounting, I suggest that punitive measures should be taken by national accounting bodies, courts and the government.

ii. One set of global financial reporting standards known as international financial reporting standards (IFRS) should be adopted by all operators and preparers of account or those performances an accounting duty
iii. Since accounting practices and scandals can destroy institutions, I also suggest that integrity and public confidence should be embraced by accounting officers in the discharge of their duties.

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IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY ON STUDENTS PERFORMANCE IN NIGER DELTA UNIVERSITY SOUTH-SOUTH, NIGERIA

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ABSTRACT
The application of information and communication technology has transcended different aspect of our daily lives including the education sector. This paper is aimed at investigating the impact information and communication technology (ICT) on student's academic performance in Niger Delta University, South - South Nigeria. This research is motivated by the fact that researchers have not been able to ascertain students' performance with respect to the use of ICT in the tertiary institutions. The study examined how lecturer's skills, extent of usage of ICT facilities and how availability of ICT facilities affects students' academic performance. The theoretical models were used in developing three different hypotheses that were investigated through the survey of three hundred and ninety-two respondents which were randomly selected using random sampling technique. Copies of well-structured questionnaire were administered to the respondent's sampled, also final exam scores of two sets of students that were taught by lecturers with ICT skills and those without ICT skills. The findings revealed that ICT does affect student academic performances but there is need for improvement in the extent of usage of ICT facilities.

KEY WORDS: ICT (Information, Communication, Technology), Impact, Performance, Sample, Size, Education

INTRODUCTION

1.1 Background to the Study

During the last two decades, tertiary institutions have invested heavily in Information and Communication Technologies (ICT). ICT have impacted the tertiary education in divers' ways including, organizations as well as the teaching and learning methods. One puzzling question is the effective impact of these technologies on student's performance and on the returns on education. Plethora of academic researchers has tried to answer this question at the theoretical and the empirical levels. They faced two main difficulties. One, student's performance is hard to observe and there is still confusion about its definition. On the other hand, ICT is an evolving technology and their effects are difficult to isolate from their environment.

There is no standard definition for students' performance. Standard approach focuses on achievement and curricula. How students understand the courses and obtain their degrees or their marks. However, more extensive definition deals with competencies, skills and attitudes learned through the education experience. The narrow definition allows the observation of the outcomes of any change in tertiary education. The more extensive definition needs a more complex strategy of observation and a focus on the labour market. The outcomes of education are mainly validated in the labour market. The relationship between the use of Information and Communication Technologies (ICT) and students' performance in tertiary Education is not clear. The literature shows contradictory results. Earlier economic research has failed to provide a clear consensus concerning the effect on students' achievement.

Nigeria as a sovereign nation recognizes education to be an instrument for economic growth. In this connection, Aina (2008) asserted that, education is, in many ways, the pulse of the society. Alexis (2010) refers education to be the process of learning and acquiring information. It is thus the moulding of the entire behaviour of an individual in a positive way through the two methods of transmission of educational values; informal and formal. The use of (ICT) for effective classroom teaching and learning has for

a long time been introduced in the developed countries in order to improve the efficiency and effectiveness of education at all level. Punie, et al (2006) supported this claim when they stated that a study in 2002-2003, on the pace of integration of ICT in teaching in more than 200 European countries, found that ICT use is in place and that almost everyone in the university has access to computer, the internet and e-mail account.

ICT, according to Toomey (2009) is generally related to those technologies that are used for assessing, gathering, manipulating, and presenting or communicating information. The technologies could include hardware for example Computer and other devices); software application and connectivity namely: access to the internet, local networking, infrastructure, and video conferencing. All these constituents of ICT have continued to be used in the teaching and learning of various subjects in schools at all levels. This is because access to information has continued to grow on daily basis. Hence ICT has become a significant aspect and agent of education, especially in the developed countries.

However, in Nigeria, ICT is at its infant level. In this regard, Olubamise (2007) asserted that in most educational and research institutes, ICT infrastructures are just being put in place. ICT provides an enabling tool for this interaction, especially as it allows the teacher to teach in various ways and also enables the learners to learn in an improved ways and in ways relevant to the information economy. It is important to say that ICT alone does not automatically add quality to teaching and learning. This is because it can be used for destructive, immoral or to favour learners or group of learners. Despite this negative effect, ICT provides unique context for accelerating teaching and learning especially if used in a positive way.

1.2 Objectives of the Study

The main objective of the study is to assess the impact of Information and Communication Technology (ICT) on the performance of student in Niger Delta University, Amassoma.

1.3 Research Hypotheses

The following research hypotheses were formulated and tested at .05 level of significance:

i. **Ho_1**Lecturers skills in using ICT facilities/tools have no significant impact on student's academic performances in tertiary institutions in Nigeria.
ii. **Ho_2**The usage of ICT support tools by lecturers in teaching has no significant impact on student's academic performances in tertiary institutions in Nigeria.
iii. **Ho_3**Availability of functional ICT facilities in tertiary institutions has no significant impact on student's academic performances in tertiary institutions in Nigeria

REVIEW OF RELATED LITERATURE

2.0 Theoretical Framework

The advent of ICT in teaching and learning has witnessed series of research at all levels of education. Hence, the direction of any study is influenced by the theoretical perspective. Markus and Lynn (2009) stated that there has been a growing recognition that technology used in the absence of a sound theoretical framework or pedagogy is generally not effective in reaching program.

2.1 Concept of Information and Communication Technology (ICT)

Information and Communication Technology (ICT) has been defined in many ways, as such no one single definition is universally accepted. The reason for this is that, the applications and the techniques involve keep on changing almost on hourly basis. As a result of this, ICT is defined according to usage. According to Anonymous (2009), ICT deals with digital data and the ways of storing, retrieval, transmission and receipt of information. It stressed further that it deals with the way these concepts work when put together. Tinio (2009) defined ICTs as a diverse set of technological tools and resources used to communicate, to create, disseminate, store, and manage information. These technologies include, computers, the internet, broad casting technologies (radio and television) and telephoning. Toomey (2009) on the other

hand, related ICT to those technologies that are used for accessing, gathering, manipulating and presenting or communicating information. The technologies according to him could include hard ware (e.g. Computers and other devices); software applications and connectivity (e.g. access to the internet, local networking infrastructure, video conferencing). Similarly, Ngurukwem (2005) stated that ICT is not limited to computer applications as it includes the internet, news prints, etc. He categorized current ICTs into three, namely: Information Technologies which has become synonymous with the use of computers, supporting this view, Olubamise and Awe (2007) stated that Information Technology uses computers, which have become indispensable in modern societies to process data and save time.

The use of computers is so pervasive to modern development in commerce, education and governance, amongst others. Telecommunication Technologies comprising telephones (with fax) and the broadcasting of radio and television, often through satellites, and Networking Technologies of which the best known is the internet; but which has extended to mobile phone technology. In a related view, Akinola (2005) identified the following technologies as the elements of ICTs: Media of Communication (e.g. radio, television), Information Machine (e.g. Computers), Telecommunications techniques and equipment (Satellites, fibre optic cables, phones, facsimile machines).

The driving force for elevating ICT into its present status is Telecommunication technologies. Trucano (2009) shared this view and remarked that telecommunication infrastructures in particular have become the driving force of ICTs', they have the capability to link various ICT elements together irrespective of location, and to provide a converging platform for the elements. In a related view, Toomey (2009) stated that what are most significant about ICT are the increasing convergence of computer-based, multimedia and communications technologies and the rapid rate of change that characterizes both the technologies.

2.2 Use of ICT in Education

There is no aspect of human endeavour that has not in one way or the other benefited from the use of ICT. Education sector is not an exemption. This is because it has made learning easier, more accessible and more effective. This is true of most developed countries. Kwache (2007) shares this view and remarks that Information and communication technology (ICT) is an indispensable part of the contemporary world. The field of education has certainly been affected by the penetrating influence of information and communication technology worldwide and in particular, developed countries, ICT has made an impact on the quality and quantity of teaching, learning, and research in the traditional and/or distance education institutions using.

Larsen and Vincent (2005), on the other hand, noted that ICTs are a very powerful tool for diffusing knowledge and information, fundamental aspect of the education process: in that sense, they can play a pedagogic role that could in principle complement (or even compete with the traditional practices of the education sector. Kwache (2007), however, noted that easy worldwide communication provides instant access to a vast array of data, challenge assimilation and assessment skills, rapid communication, plus increased access to IT in the home, at work, and in educational establishments which could mean that learning becomes a truly life-long activity, an activity in which the pace of technological hang forces, and the constant evaluation of the teaching-learning process itself.

Similarly, John (2009) observed that the 1990's was the decade of ICT access particularly with the popularity and accessibility of internet based services such as electronic mail and the World Wide Web (WWW). At the same time the CD-Rom became the standard for distributing packaged software (replacing the floppy disc). He further stated that, as a result of ICT, educators became more focused on the use of the technology to improve students' learning as a rationale for investment. Fundamentally, effective use of ICT tools in education means a

lot to the overall educational development of any country.

2.2.1 Different Kinds of ICTs Implemented in Teaching and Learning

ICTs have become necessary in contemporary societies. The educational system is not an exemption as ICT had contributed and has continued to contribute to expansion of knowledge. This view was echoed by Ngurukwem (2003), when he stated that while ICT continues to evolve to meet the information needs of modern society, advancement in ICT has created new opportunities that are capable of extending the frontiers of knowledge. In a related view, Punie, et al (2006) postulated that it is difficult and maybe even impossible to imagine future learning environments that are not supported, in one way or another, by ICTs. Valasidou and Bousiou (2008) stated that there are different kinds of ICTs implemented at teaching and learning such as television, videoconferencing and e-learning tools. Some of the tools include:

i. Computer Systems (ii) Networking (iii) Internet (iv) The Electronic Mail (e-mail) (v) Teleconferences (vi) Facsimile Transmission (FAX)

2.2.2 Effect of ICT on Teaching and Teacher

There is growing evidence over the years that appropriate ICT in the classroom can promote the shift from traditional teacher method to learner- centered method. Despite the fear that possibly ICT will eliminate the roles teacher plays in the classroom, teachers still remain central to the learning process. This is confirmed by Trucano (2005) when he stated that a shift in the role of a teacher utilizing ICTs to that of a facilitator does not obviate the need for teachers to serve as leaders in the classroom traditional teacher leadership skills and practices are still important especially those related to lesson planning, preparation and follow-up).

The effect of ICT on teaching and the teacher, on the other hand, depends to a large extent on how teachers use ICT within teaching and learning process. Gerhard (2007) in support of this opines that most progress has been made in recent years in raising teacher's positive attitude towards ICT by realizing its value for learning through more experienced and embedded one. He further stated that teachers increasingly use ICT to prepare their work more efficiently and achieve time gains.

In the same vein, ICTs are potentially powerful tools for extending teachers opportunities, for accessibility to remote learning resources. Tinio (2009), stated that teachers and learners no longer have to rely solely on printed books and other materials in physical media housed in libraries (and available in limited quantities) for their educational needs. He further stressed that with the internet and World Wide Web (www), a wealth of learning materials in almost every subjects and in a variety of media can now be accessed from anywhere at any time of the day. A teacher can access the internet to search for detailed explanation of areas that are elusive and current thinking or ideas in a particular field, this will make teaching current and more relevant.

3.0 RESEARCH DESIGN AND METHODOLOGY

3.1 Research Design

The study employed a cross-sectional research design. Cross-sectional design is a type of observational study that involves the analysis of data collected from a population, or a representative subset, at a specific point in time.

3.2 Population of the Study

The population size of the Niger Delta University can be estimated at about 14,000 which comprises of both students and academic staff only.

3.3 Sample Size and Sampling Procedure

The sample size of the study comprised of representatives of students and lecturers from the 9 faculties and the college of medical sciences under study

$$n = \frac{N}{1+N(e)^2} \ldots\ldots\ldots\ldots\ldots\ldots .3.1$$

Where n is the sample sizes, with N the population size here 14000 and e is the level of precision as 0.05.

Hence the sample size can be calculated as

$$n = \frac{14000}{1+14000(0.05)^2} \text{n} = 388 \ldots\ldots\ldots\ldots\ldots 3.2$$

3.4 Instrument for Data Collection

Questionnaire was used to collect data from the respondents. The questionnaire was divided into two sections: "A" and "B". Section "A" comprised of personal data of the respondents such as age, gender, educational qualification, level etc. Section "B" consisted of the questionnaire based on the research questions in chapter one. The same questionnaire was administered to both Lecturers and students respondents. A5-point Rating scale was used in rating the responses.

Rating Scale

SCALE POINT

Adequately skilled (AS) 5, Skilled (S) 4, Neutral (N) 3, Fairly Skilled (FS) 2, Not Skilled (NS) 1

SCALE POINT

Strongly agree (SA) 5, Agree (A) 4, Neutral (N) 3, Disagree (D) 2, Strongly Disagree (SD) 1

SCALE POINT

Very Adequate (VA) 5, Adequate (A) 4, Neutral (N) 3, Fairly Adequate (FA) 2, Not Adequate (NA) 1

3.5 Validity of Research Instrument

In order to ensure content validity of the instrument that was used for the study, the researcher gave the questionnaire to the research supervisors at the Niger Delta University, Bayelsa, and other specialists in the field of research study to vet the instrument. The instrument was restructured in line with the suggestions made by the supervisors and the specialists.

3.6 Instrument Reliability Test

A pilot survey study was conducted with questionnaire to test the reliability of the instrument. The retrieved questionnaire is to determine the reliability. The responses of thirty (30) students and eight (8) lecturers were statistically analysed using Pearson Moment Correlation Coefficient.

3.7 Procedure for Data Collection

Copies of the questionnaires were administered to both lecturers and students via research assistants in each of the studied departments.

3.8 Procedure for Data Analysis

Descriptive statistics was used to analyse the subjects responses while Difference in Difference Frequency Tables and Percentages were used to analyze the respondents response and Difference in difference(DID) or Double Difference (DD) methods of data analysis was adopted to evaluate the impact of ICT skills, Usage of ICT tools and availability of ICT facilities on the academic performance of students in The Niger Delta University. We compare outcomes between academic performance (outcome Y) of students taught by lecturers with IT skills and those taught by lecturers without IT skills. The students were evaluated on the performance on the courses before and after the lecturers taught them. However, using the double difference quasi-experimental approach does not eliminate all unobserved heterogeneity of student who may be taught by lecturer with IT skills and those who do not.

In this study, the two groups are indexed by treatment status T=0 or 1, where 0 indicates those without (lecturers without skills) and 1 indicates students taught by lecturers with IT skill (treatment group). Estimated data were collected on the observed students in two time periods before and after treatment - t = 0 or 1, where 0 indicates a time period before the treatment group adopted the new technology and 1 indicate time period after the treatment group adopted the new technology (post treatment). The full model to estimate the Impact of IT technology on the performance of students is presented in equation 3.3;

$$Y_{student's\ performance} = \beta_0 + \beta_1 treatment_h + \beta_2 after + \beta_3 (treatment_h * after) + \varepsilon_{ht} \quad \ldots\ldots\ldots 3.3$$

β_0, β_1 *and* β_3 are the unknown parameters, where β_0 is the constant term, β_1 specific effect of the treatment group which is average accounts for permanent difference between the treatment group and control group, β_2 is the

performance effect of the IT technology (treatment) post treatment, β_3 is the time trend common to both the treatment and control groups as the known parameters and ε_{ht} is the random, unobserved error term that contains all other determinants of students' academic performance. Let $\bar{Y}_0^T$ and $\bar{Y}_1^T$ be the sample average of the outcome for the treatment group before and after treatment respectively, and let $\bar{Y}_0^C$ and $\bar{Y}_1^C$ be the corresponding sample average of the outcome for the control group. The Difference in Difference (DID) estimator is the difference in average outcome in the treatment group before and after treatment minus the difference in average outcome in the control group before and after treatment is given by

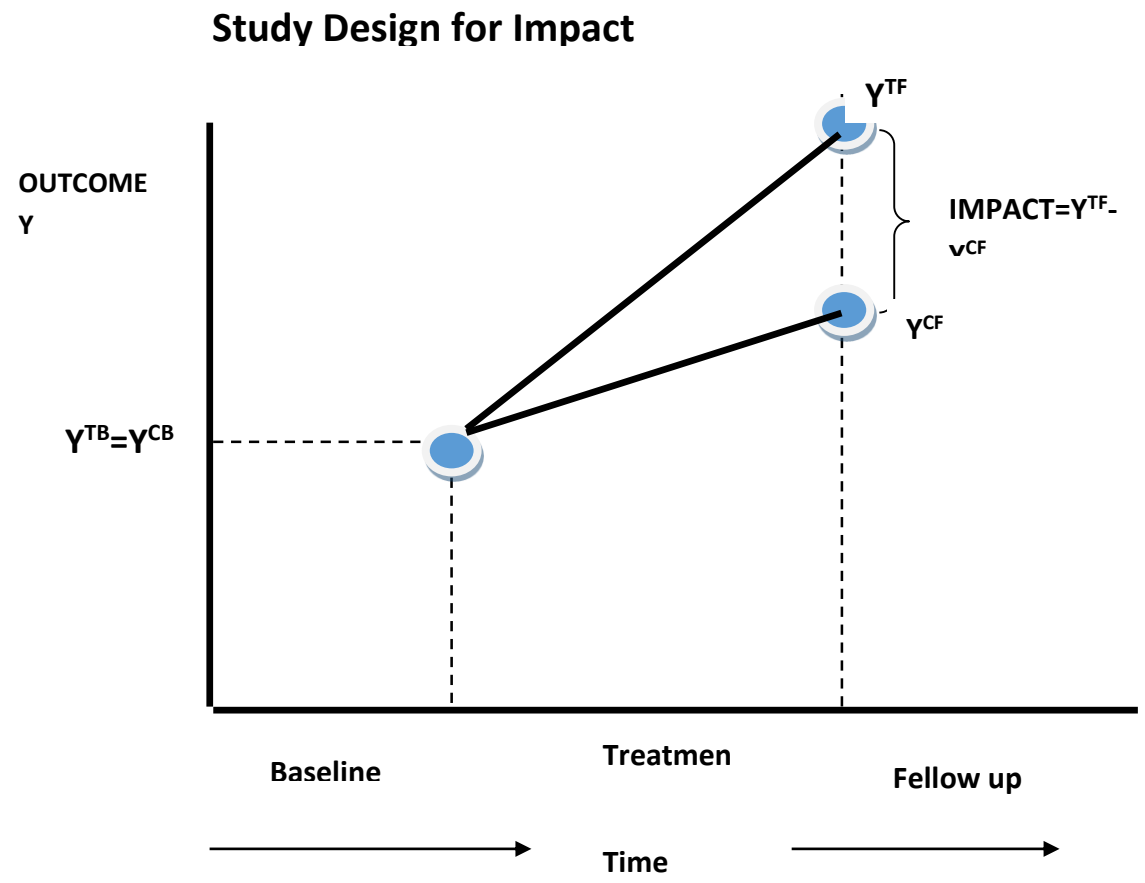
$$\tilde{\delta}_{DD} = \bar{Y}_1^T - \bar{Y}_0^T - \left(\bar{Y}_1^C - \bar{Y}_0^C\right) \quad \ldots\ldots\ldots\ldots 3.4$$

Therefore, $\tilde{\delta}_{DD} = \delta$ (which is an unbiased estimator)

The Table3.1 indicates that the first row ends with the estimate $\tilde{\delta}_1$, the second column ends with estimate $\tilde{\delta}_2$, and the lower right hand entry give the estimate.

Table 3.1 Double Difference between Control and Treatment Group

Academic Performance (Y)	Before	After	After-Before Difference
Treatment Group(Lecturers with ICT skills)	$\bar{Y}_0^T$	$\bar{Y}_1^T$	$\bar{Y}_1^T - \bar{Y}_0^T$
Control Group(Lecturers Without ICT Skills)	$\bar{Y}_0^C$	$\bar{Y}_1^C$	$\bar{Y}_1^C - \bar{Y}_0^C$
Treatment - Control	$\bar{Y}_0^T - \bar{Y}_0^C$	$\bar{Y}_1^T - \bar{Y}_1^C$	$\bar{Y}_1^T - \bar{Y}_1^C - \left(\bar{Y}_0^T - \bar{Y}_0^C\right)$



.

Source: Bruce Larson and Paul Hutchinson (2010).
Fig 3.1 Study Design for Impact

4.0 RESULT AND DISCUSSION

4.1 Result

In the study, a total number of 350 students and 50 lecturers were sampled giving a total of 400 questionnaires that were distributed. A total of 392 (98%) fully completed questionnaires were retrieved out of which 342 students (97.71%) and 50 lecturers (100%). This gave a response rate of 98% as shown in Table 4.1.

Table 4.1: Questionnaire return rate Respondent category

	Number issued out	Number returned	Percentage
Students	350	342	97.71%
Lecturers	50	50	100%
Total	400	392	98%

Result on the test of Hypothesis 1**(**Lecturers skills in using ICT facilities/tools have no significant**)** is presented in Table 4.**2**

Table 4.2 Shows the double difference estimation for the treatment group

```
. regress testscore DTrt DAfter DTrtXDAfter

      Source |       SS       df       MS              Number of obs =     364
-------------+------------------------------           F(  3,   360) =   92.39
       Model |  37621.0182     3  12540.3394            Prob > F      =  0.0000
    Residual |  48864.9709   360   135.73603            R-squared     =  0.4350
-------------+------------------------------           Adj R-squared =  0.4303
       Total |   86485.989   363  238.253413            Root MSE      =  11.651

------------------------------------------------------------------------------
   testscore |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       DTrt |    27.78044   2.701354    10.28   0.000     22.46802    33.09285
     DAfter |    14.36594    2.70853     5.30   0.000     9.039411    19.69247
DTrtXDAfter |   -6.336611   3.018014    -2.10   0.036    -12.27176   -.4014588
      _cons |    31.40115   2.553355    12.30   0.000     26.37979    36.42252
------------------------------------------------------------------------------
```

The result of Table 4.2 shows the regression for the average performance before and after lecturers who taught students subjected to IT skills training. The result of the analysis shows that the IT skills of the lecturers had impact on the students' academic performance with probability value (p-value) of 0.036 which is less than the significance level of 0.05. It can therefore be concluded from the result that lecturer's skill in using ICT facilities impacts on student's academic performance in Niger Delta University. The improvement observed in the academic performance of students is a result of the improvement in the skill of lecturers in the use of ICT facilities.

Hypothesis 2: The second null hypothesis was stated as: "extent of usage of ICT support tools are not correlated with students Education.The usage of ICT support tools by lecturers in teaching has no significant impact on student's academic performances in Niger Delta University Nigeria.

The model summary of the ANOVA and coefficients for the variable s are presented in Table 4.3. the result shows that there is moderate positive relationship between the student's performance and the control and treatment variables considered in this study with correlation coefficient of 0.7553 and coefficient of determination R^2=0.5705 which is the total variation in the student's academic performance attributable to the variation in the pre-treatment and post treatment effect. It implies that we can adopt the double difference model to predict the impact of usage of ICT support tool. From the result of the ANOVA model it can be observed that the difference in difference model specified in this work is adequate in predicting the impact of Usage of ICT support tools by lecturers on academic performance of students in Niger Delta University. Thus, the combination of the predictor variables significantly predicts the dependent variable (F=159.41; P=0.000<0.05). The model seems to be good. From the double difference parameter the coefficient of the interaction parameter (ICT Support before and after) is 16.23208 and standard error of estimate 1.95564 shows a healthy parameter with probability (p) -value of 0.000 < the significance value 0.05. We reject the null hypothesis and accept the alternative hypothesis which states that Usage of ICT support tools has significant impact on the academic performance of student's in Niger Delta University.

Hypothesis 3*:* Availability of functional ICT facilities in Niger Delta University has no significant impact on student's academic performances in the institution.

Table 4.3 Model Summary, ANOVA and Coefficient Values of the Predictors

```
. regress testscore_functional_facilities Dtrt_functional_ICT_before Dtrt_functional_ICT_after Functional_ICTbeforeXAfter

      Source |       SS       df       MS              Number of obs =     364
-------------+------------------------------           F(  3,   360) =  160.43
       Model |  35133.6387     3  11711.2129           Prob > F      =  0.0000
    Residual |  26278.8009   360   72.996669           R-squared     =  0.5721
-------------+------------------------------           Adj R-squared =  0.5685
       Total |  61412.4396   363  169.180274           Root MSE      =  8.5438

------------------------------------------------------------------------------
testscore_functional_fac~s |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
---------------------------+--------------------------------------------------
Dtrt_functional_ICT_before |   1.608606   1.256523     1.28   0.201    -.8624425    4.079654
 Dtrt_functional_ICT_after |   .2336431   1.431391     0.16   0.870    -2.581296    3.048582
Functional_ICTbeforeXAfter |   20.08728   1.839434    10.92   0.000     16.46989    23.70466
                     _cons |   38.35366   .9435058    40.65   0.000     36.49818    40.20913
------------------------------------------------------------------------------
```

4.2 Discussions

Finding from this study reveals that the level of lecturer's skill in the use of ICT facilities in teaching fairly adequate. It could be deduced from the responds that the level of lecturers' skill in using computer to teach courses is fairly adequate as most respondents were neutral or agreed. The result of the study has shown that the level of lecturers use of the internet for data collection was adequate with 91% agreeing, lectures making use of ICT devices for lecture presentation had most of the respondents neutral and that isn't a positive sign but looking at lecture skills in the use of computer software directly related to the course having less than 67% of the respondents feeling it was adequate was indeed positive to note. The researcher was of the opinion that lecturers are skilled in the use of ICT devices to improve their development was somewhat adequate but still lack skill in the use of ICT in the training of students.

Tearle (2003) and Drenoyianni (2004) agrees that variations in the ICT skill base of individuals can impede the use of ICT for teaching and learning. Drenoyianni (2004) advocates a phased approach where students are required to complete a mandatory initial introduction to ICT and this in turn leads to training in the more complex ICT packages. In this way the introduction to ICT is a preparatory stage allowing students to build their ICT confidence where they later learn to utilize ICT in the learning context. Minimum standards of expertise are maintained and standards met but not ending on the Microsoft office suite like what the University was doing (Mbwesa, 2002). As such the researcher fashion his questionnaire to determine the extent of usage of ICT tools and facilities by first finding out if both staff and students make use of the basics ICT devices before determining if they do for more complex purposes.

As such the respondents were asked if lecturers make use of ICT support tools such as Internet and about 80% did agree but when the researcher tried to determine if lectures use it as an option to teach when students don't understand, the response is negative as over 70% of the respondents' disagreed. The use of ICT support tools to setup exams and test online had neither positive nor negative response as the respondent were mostly neutral.

According to Mbwesa (2002), the availability of ICT resources can enhance learning by making education less dependent on differing teacher quality and by making education available at home throughout the day. Furthermore, it was stressed that the availability and use of ICT can help students exploit enormous possibilities for acquiring information for schooling purposes and can increase learning through communication. Jonassen (2000) explains that when computers and related technology are made available in schools and institutions, students are compelled to use databases, spread sheets, multimedia, e-mail, and network search engines to complete their projects. Such processes provide greater potential to promote cognitive development. Also according to Jackson, et al (2003), computers raise the potential to equip students with higher-order skills such as inquiry, reasoning, problem solving and decision making abilities, critical and creative thinking and learning how to learn. Research also showed that using computers has a positive effect on students achievement compared to traditional methods (Sterling and Gray, 1991 in Means, Barbra (ED.) (2004). The result of this study further reveals that functional computers in the institution are adequate; this may be mainly due to the fact that students and lecturers are encouraged to own such. It also reveals that there are functional computer labs. The study reveals that power supply to ICT devices is a challenge in the Institution.

It can therefore be deduce that student academic performance was significantly different in the after treatment and difference in difference analysis confirms that there was differential academic performance and improvement between the "counterfactual" (those students who were taught by lecturers without usage of ICT support tools) and the "factual" (those students who were taught by lecturers with proper usage of ICT support tools).

5.0 CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

Based on the finding of the study, it is concluded that:

The impact of ICT tools and facilities has a direct link with student education; it affects both the student's interaction with lecturers as well as the way students approach learning among others.

Lecturers are largely not skilled in the use of ICT tools and facilities to impact knowledge directly rather they use it mainly to source for information and send information. Access to the internet need to be addressed as they are both crucial to the use of ICT tools and facilities and the provision if any is highly insufficient. ICT support tools significantly impact on the academic performance of students in The Niger Delta University. Every effort should therefore be made to encourage lecturers in tertiary institutions in Nigeria to use ICT support tools to teach their students in order to improve their student academic performance and to enhance the lecturers' teaching capabilities in line with global best practice.

5.2. Recommendations

Based on the findings of this study, the following recommendations are made.

1. There is need for the Universities to train and retrain lecturers on the use of ICT tools and facilities not just for their personal development but to be able to use them to teach students and also examining the students. More so the lecturers should be encouraged to device means to teach their courses with the use of ICT devices specifically for their course. I.e. Using software related to a course to teach the courses.
2. There is a need to setup and maintain internet connection in Nigeria Universities and connect more computers to the internet. The Universities should then liberalize accessibility to internet in the institutions and establish an ICT resource centre where various softwares can be accessed. Lecturers and students should also be encouraged to sort for

and share software's related to their courses as this would improve their access to such software's.

3. Lecturers need to be encouraged to train students on the need to make use of ICT devices during lectures and setup exams and tests online.

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WOMEN IN JOURNALISM AND THE GENDER ISSUES IN NIGERIA

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Abstract
This article looked at the issue of gender censorship and discrimination in the journalism profession, the cause and how it affects the contributions of the female folk. Gender bias has not given women the opportunity to occupy decision making and policy formulation positions in most media organizations globally. The paper sees the media as the best instrument that can be used to change this ugly trend. To address this issue, the male dominating ideology should be eliminated from the profession and women should be given the opportunity to participate in the editorial board so that they can also have a say in the decision making and policy formulation of the media organizations.

Key words: ***Media, Gender Issues, Discrimination, Censorship, and Journalism***

1.0 INTRODUCTION

1.1 Background of the study.

The female sex is considered as a second-class citizen in most countries of the world. They are regarded as the weaker sex, unintelligent and unfit to undertake certain jobs. They are reduced to do household chores. In Tanzanian oral literature (traditional media), a woman is regarded as a "mother, as a man's pleasure object or as a man's property" (Gallagher, 1981:61).

Women are not given proper recognition in their professional fields no matter their qualification and performance in the field. Women who try to compete with their male counterparts are being silenced. This gender discrimination cuts across all spheres of life including journalism. This bias is embedded in a range of social mechanisms that mute women's voices, deny validity to their experiences and exclude them from active participation (Siobhan, 1995:20). Hence, women struggle to get out of this gender discrimination.

Baer (1980) notes that women journalists and writers generally are fighting for liberation. The primary role of the media is informing, entertaining and educating the public. There is no area of the profession that is tied to a particular sex, yet gender censorship still surfaces in the profession and denies women of their professional opportunities. Stereotyping against women should be discouraged so that women will be accepted as equal to their male counterparts in the place of work for increased productivity and accelerated development.

It is a common fact that women are not given their rightful place in the society. Women writers are faced with problems in the course of carrying out their professional responsibilities, either they are criticized based on gender, religious or societal beliefs. Feminist research has shown that "ideas and works of art that express views not in accordance with the dominant ideology are prevented from reaching their intended audiences (Paley, 1979). Such works may be misinterpreted, defamed, ignored, banned or even seized in order to silence their authors. The aim of this paper is to look at the wrong perception of women by the society and the gender based censorship in their professional fields, in this instance the journalism profession.

2.0 LITERATURE REVIEW

Theoretical Framework

This paper is built on the Agenda Setting Theory of the media. This theory stipulates that there is a relationship between news coverage and public perception on the importance of issues. It also posits that mass media's attention to an issue

will elevate such issue to high point of importance by the public (Nemine, 2005). Severin and Tankard (1979) explained the agenda setting function of the press thus: "In a sense, the newspaper is the prime mover in setting the territorial agenda. It has a great part in determining what most people will be talking about, what most people will regard as the way problems are to be dealt with. They set the tone and fix the rules making certain issues to predominate discussions at all costs, and determining when in their view, society has had enough."

Therefore, the foregoing portends that the mass media can influence the public's perception on issues and try to re-orientate the thinking of the public. This they can achieve through features and articles on women in the media and have a positive change to an extent on the discriminatory attitudes placed on women globally and in Africa.

The Situation Globally

The primary function of the media is informing, educating and entertaining the public and the journalist is a key figure in this profession. Aster (1991) noted that the journalist is an indispensable person in the media house. He is the foundation stone of the media structure. Without the journalist, the seeker and writer of the news, therefore, all the vast and intricate mass of machinery of melting pots, of dynamos, of automatic telegraphs and pictures all, would be useless. The journalist carefully and skillfully selects and writes out events as news for presentation in journals, newspapers, magazines and electronic media organizations.

The qualification of a journalist is not tied to a particular sex, yet women journalists suffer discrimination from their workplaces. Studies have shown that the media in Bangladesh is dominated by males, who occupy leading positions at all levels. Although, more women are making a career out of journalism, the profession still needs a serious gender balance in this age of information revolution to check the gender bias in the profession (Rahman, 2006).

In Russia, the word "women writer" is seen as nonsense or meaningless work. It is gender based and using it is problematic for many. This is because men begin to laugh and say all manner of stupid things about women. Hence, most serious minded writers prefer to use the word "man writer" to distinguish the quality of their creative activities. Women's write-ups are regarded as something inherently unserious, non-talented and second rated. Tuchman (1978) in Baer (1980) notes that feminist research into the mass media has shown that women tend to be portrayed as submissive, passive and portrayed largely in terms of their sexuality and domestically, while men tend to be shown as dominant, active and authoritative. Gender based criticism hinders the full participation of women in many fields of study including journalism. The threats that female journalists working in certain sensitive areas face only dampen their enthusiasm to take up more challenging journalistic reporting and investigations. Even in the face of such challenges few women have stood up to the challenges and one can appreciate their very successful presence in the media.

The ideology that the men should be in charge has made these gender criticisms more pronounced that even women who are more qualified than their male counterparts dump their profession to become full-time housewives. Although women account for more than half of global population, their level of involvement in key decision making position is still very low. In a study by Reuters Institute, University of Oxford, only 22% of the 180 top editors across 240 online and offline news outlets in 12 different markets across four continents are women. Top editors are important as they are key figures leading newsroom direction and decision making, shaping what news and newsroom look like (Griffin, 2024). The top editors also play a role in the relationship between journalists and audience (Duffy, 2019). The International Federation of Journalists indicates that there are some 300,000 women in the profession worldwide, however they rarely reach decision making positions, nor do they influence editorial policy. For instance, issues of vital concern to women – child marriages in

Afghanistan and Pakistan, the trafficking of women in Asia and Europe are often ignored or covered only superficially by the media of their own countries.

Helen (1980) noted that women are subject to systemic annihilation through their condemnation, trivialization and absence in the mass media. Women who try to compete with their male counterparts are branded with different names just to silence them. Across the globe, women journalists and media professionals work many times under difficult circumstances to bring to light the issues that affect all women.

Ade Tanesia in an Asian Pacific E-newsletter noted that in 1998, Indonesia entered the reformation era and liberated itself from the repressive and authoritarian New Order Regime. Since then gradual reformation has also been seen in the world of media as shown by the emergence of various forms of print, audio-visual media. However, have these media given priority to the voice of the public? In reality, most of them do not provide any space for the common person's voice. Even though there are about 650 community radios in Indonesia, the question still remains as to whether community radios have been fully accessed by marginalized groups of people, which does not exclude the women. The result of a questionnaire distributed by the World Association of Community Radio Broadcasters and Women's International Network, Asia Pacific to a number of community radio has shown that women's involvement in the management of community radios is still insufficient. The same condition is found in their programs; only a small fraction of programs are dedicated purposely to women. In most cases, women's programs are about recipes, health and beauty instead of women's rights.

The Situation in Africa

The lack of gender sensitivity in the media is evidenced by the failure to eliminate gender based stereotyping that can be found in public and private, local, national and international media organizations. Print and electronic media in most countries do not provide a balanced picture of women's diverse lives and contributions to society in a changing world. This situation seems to worsen in Africa and Nigeria with its patriarchal ideology. They try to silence women by all possible means available to them. They exercise these authorities through their traditional beliefs of "the man is the head", religious rules, ignorant parents who believe it does not pay to invest in a girl's education, etc. Most of the times, these criticisms begin from the home, where parents, siblings and even husbands destroy their relations manuscripts. This they do with the fear that the female writer may rule over them if given the opportunity to perform thereby scaring most women out of their professional fields, journalism inclusive.

Gentleman et al (1979) in Ubwa (2002) noted that, the analysis of media content in relation to women and gender role has shown that worldwide; women are underrepresented in the media. The Win Document of 1985 found from a survey that women in Nigeria are generally not in the news and that when they do appear, it is usually as supporters of men, objects of pleasure and subordinate servitor roles. Ogundipe and Leslie (1982) also noted that majority of women in Nigerian literature are highly stereotyped "ranging from the silent backgrounders pounding yam to the idolized maturing Madonna virgin through to the destructive whore. According to Gallagher (1979), survey of images of women in the media show that "on film, in the press and in the broadcast media, women's activities and interests typically go no further than in the confines of the home and family. This is characterized as essentially, dependent and romantic. More so, women are rarely portrayed as rationally, active or decisive, both as newsmaker in the press or as well as being numerically underrepresented.

Researches into the ideological content in the mass media particularly in relation to women are depressing. The current gender and women issues in Nigerian society and the magnitude of problem posed by gender inequality, in every aspect of Nigeria today are the result of a complex set of factors. Ubwa (2002) notes that while some of the factors are indigenous to Nigerian cultures, others are created by policies

and rules designed in the colonial context and the legacies which have been perpetuated by Nigerian male dominated ideology that may have developed little gender awareness. Women are still regarded as fickle-minded, incompetent and irrational people. This is given expression in the kind of coverage given to women by the media – Nigerian publications such as Daily Sun and the Vanguard have pictures of seductively dressed women on their pages with odd words and such pictures usually bear no relevance to any of the articles in the content. Studies have shown that in sub-Saharan Africa that women have little presence in media organizations and the media content is not adequately addressing women's issues. A similar pattern is noted for newspapers in Sierra Leone. Uche (1999) observed that out of 191 employees in Sierra Leone Daily Mail, only 36 are females. All these are low category staff, who work as book binders, clerks, cleaners, etc. Moreover, these newspapers rarely published articles contributed by female reporters. The story remains the same even in countries where women have made significant strides towards equality. The pinnacles of culture and politics remain almost exclusively male and are heavily guarded.

The various ethnic groups in African and Nigeria have classified women and men in sex roles. As a result of this classification, feminism has become synonymous with domesticity and anything engaged in by women that does not fall into category is seen as wrong and being criticized. Masculinity on the other hand is associated with mobility, power, superiority and opportunities in the supra-domestic sphere. The status of women in Nigerian society is one of subservience to the men. Most important occupations in the society such as journalism, engineering, etc. are the men's prerogatives while women are confined to housework and helping the male folks. As a result of these ills, the professional woman is not adequately used as to harness the productive potentials in her.

Studies have proved that the representation of women in the mainstream Africa has shown that women are relegated to the background in news coverage and presentation and the existing images in the African media are primarily that of sex symbols, homemaker or fashion stereotypes or wives of important men.

Steeves (1999) in a study of the two largest Zambian daily newspapers, states that women were often represented as indigenous pin-ups. Furthermore, she observed that although career women were praised for their independence and initiative, they were criticized for being unmarried. A similar finding was also recorded in Senegal, Uganda and Tanzania. According to Emilie (1991), the various professional and craft organizations to which journalists belong do not differentiate in any way between men and women. In these institutions, women are not elected to its governing council. In Nigeria, the Nigerian Ports Authority (NPA) and the Newspaper Society makes no difference between men and women as regards regularized payment and hours and conditions of work. She also noted that it is only when one gets to the actual newspaper office that we meet with the curious abnormality of the woman journalist. She also observed that, the individual journalists who are women have positions as women correspondents, war correspondents, reporters and departmental editors but the everyday staff demand for the service of the woman journalist is however, in actual practice chiefly confined to the editing of women's section. No reason other than gender base has been given for this disparity. In relating her personal experience as a woman journalist, it was applied in response to an advertisement in the Daily News for sub-editorship on a morning newspaper. The reply she got was thus:

> *Dear madam,*
> *We regret that we cannot possibly see our way to offering a position as sub-editor to a lady. The difficulties and objectives are in our view insuperable, and you will forgive us for not going into them. But we do wish to say this – that on its merits, your application is perhaps the best of a great number (about 1,000 which we received in reply to our*

advert in January) Emilie (1991).

Emilie is one out of thousands of women journalists who have suffered rejection, denial and frustration from their professional field. The constitution of the Federal Republic of Nigeria, Chapter 11, Section 17(2a) and (3a) states that: *"Every citizen shall have equal rights, obligations and opportunities under the law … all citizens without discrimination on any ground whatsoever shall have the opportunity to secure suitable employment."*

The content of this section of the Constitution has not been followed as a result of the gender bias in the journalism profession. The Constitution states that, there should be no discrimination of any sort, and that all citizens (male or female) be given equal opportunities to secure employments. This also means that the practice of journalism is not for a particular sex, when one has the necessary qualification to practice. The gender issue therefore, should not be brought into newsrooms, news coverage and the journalism profession in general. The Constitution has guaranteed equal rights for all citizens regardless of gender or circumstances of birth.

3.0 CONCLUSION AND RECOMMENDATIONS

3.1 Conclusion

The media has tremendous power in shaping the opinions and perceptions of people worldwide. Similarly, the media plays an important role both in shaping and reflecting gender roles and stereotypes. Less than fifty years ago, journalism was an almost exclusively male profession. Female journalists were the exception and women were discouraged from entering the profession. Today, more and more women are being employed as journalists. In some countries for instance in parts of Central and Eastern Europe, women make up the majority of working journalists. In spite of this increase, the number of women in decision making positions in the media is still very low. Gender segregation within the media profession still persists.

The images projected of women in the media of communications; both print and electronic media have often given negative and degrading pictures of women, which have serious effect on the ways in which women are perceived of their status in the society. In addition, violent and degrading or pornographic media products are also negatively affecting women and their participation in society. Programming that reinforces women's traditional roles can be often portrayed in a stereotypical way in news coverage of conflicts which can seriously affect their ability to raise their voices in the society.

The media has an important role to play in portraying men and women as equal members in society. There is a consensus that government at both regional and international levels should cooperate and work with private sector partners and media networks to promote equal access for women and men as producers and consumers, particularly in the area of Information Communication Technology (ICT). This includes encouraging the media and information industry consistently with freedom of expression to adopt, develop further codes of conduct, professional guidelines and other self-regulatory guidelines to remove gender stereotypes and promote balanced portrayals of women and men.

3.2 Recommendations

From the above discussions, it is clear there is gender censorship even in the journalism profession, and this goes a long way to silence the womenfolk, and hinders effective participation of women journalists. Hence, the following recommendations are given to enhance the working conditions of the female journalist and their participation in the journalism profession.

1. The issue censorship should be eliminated from the journalism profession.
2. Equal opportunities should be given to both male and female staff.
3. A defense mechanism against all kinds of discrimination against women should be adopted.
4. In-house training should be offered to all staff to update their knowledge.

5. Job security and job description should be detailed before each appointment.
6. Measures against sexual harassment at the work place should be put in place.

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DEVELOPMENT OF AN ENHANCED CHATBOT SYSTEM FOR STUDENT INTERACTION USING FUZZY ALGORITHM

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Abstract
Management of students' information such as academic records and other information in Nigeria tertiary institution faces a lot of challenges due to various factors. This therefore generally affects the organization, preservation and access of students' information. It is therefore important for tertiary institutions management to leverage on technology to cope with student information management challenges. The aim of this study is to develop an enhanced student's information management system using chatbot. The system developed in this study is enhanced chatbot system for students' interaction which integrates a fuzzy algorithm that mimics how information is processed inside human brains. The architecture of the enhanced system includes. Chatbot, the Fuzzy-Deep learning system, Context identification component, AIML Response component and Query analysis and response component. The key advantages of the enhanced system over the existing system are: It ensures real time response to all recurring questions. It is available 24 hours. The conversation intelligence is personalized. Swift web, mobile, messaging application implementation and it eliminates tedious time consuming tasks. Students' Information System using Chatbot is better than the existing system hence it is recommended that the management of institutions should adopt the application of fuzzy logic to the development of a robust students' information system via the application Chatbot technology

Keywords: Chatbot, student, information management system

1.0 INTRODUCTION

1.1 Background to the Study

Management of students' information is a key aspect of tertiary institution administration. Information system in any organization is an essential element for efficiency and growth. For this purpose, many organizations spend resources to secure a good information system in order to have reliability and flexibility in their organization. Many invented systems are focused on user friendly elements such as easy document printing, availability on mobile platforms, and flexible accessibility. The information system is also important for collecting data of all staff in an organization (Hashim and Mohamed, 2020)

In the tertiary institution, there are alarming complexities involved in the management of students' information. This is because; a Student Information System deals with all kinds of student details, academic related reports, college details, course details, curriculum, batch details and other resource related details. It tracks all the details of a student from beginning to end of the course and can be used for all reporting purposes such as tracking of attendance, course progress, completed semesters activities, curriculum details, exam details, results, etc.

More than ever before, Nigerian schools are adopting electronic information systems to improve and automate many processes that were once manual. With this large-scale movement towards Information Communication Technology (ICT) and the increasing pressure on schools to apply technology to improve their students' performance, many schools are looking for robust learning management systems as a way to enhance student learning. Recent surveys show that electronic information systems are a rapidly growing phenomenon (Annette and Abdel, 2018)

For any student, it is important to have up to date information about current exercise assignments, lectures, upcoming appointments and other daily activities. This is especially true for new students who are still unfamiliar with current routines and practices. They may also have trouble finding their way around campus, often with hundreds of different auditoriums and

rooms spread across a large area. In such situations it is important to have correct information available. Sometimes the communication of information can make use of a more active approach instead of asking the student to locate the information needed. The information can be "pushed" to the person concerned based on his profile, requiring less effort and intervention from the user. Examples of these can be updates about class, courses, automatic e-mail notifications, reminders from friends, schoolmates, or similar (Muhammad and John, 2018).

Information Systems (IS) involve a variety of information technologies (IT) such as computers, software, databases, communication systems, the Internet, mobile devices and much more, to perform specific tasks, interact with and inform various actors in different organizational or social contexts. However, the information system field is not primarily concerned with the technical and computational aspects of information technologies. In other words, what matters to an information system is how technology is appropriated and instantiated in order to enable the realization of information systems that fulfill various actors' requirements with respect to specific goals and practices (Sebastian and Dubravka, 2015)

In addition, an Information system can be defined in terms of two perspectives: one relating to its function; the other relating to its structure. From a functional perspective; an information system is a technologically implemented medium for the purpose of recording, storing, and disseminating linguistic expressions as well as for the supporting of inference making. The focus of this paper is the development and deployment of an Enhanced Student Information System using Chatbot.

1.2 Statement of the Problem

The task of managing an Information System in a school environment poses unique challenges. For instance, one of the greatest challenges facing individual schools is the lack of Chatbot integration between various information systems. The present situation in many schools is that there are many disconnected systems managing many different tasks. Systems with differing levels of functionality run independently of one another, causing multiple problems for the school's overall Information System. Furthermore, many difficulties arise from inconsistently registered data; duplicate manual data entry, the extra time needed to manage multiple user accounts for one user, and non- productive time spent on technical support. In addition to these problems, the task of maintaining each individual system is time consuming. This study will help to proffer solution to the challenges identified

1.3 Aim and Objectives of the Study

The aim of this study is to develop an Enhanced Student Information System using Chatbot. The specific objectives of the study include to:

i) design a web-based mobile application model for instant messaging
ii) train the proposed web-based mobile application model with Fuzzy-Deep Learning
iii) implement the proposed web-based mobile application model with Hypertext Pre-processor (PHP) and MySQL

2.0 LITERATURE REVIEW

2.1 Conceptual review

The understanding of the following concepts will help in comprehending and appreciating the context of the subject matter.

i) **Student:** A person who is studying at a university or other place of higher education.

ii) **Information System:** An Information system (IS) is a formal, sociotechnical, organizational system designed to collect, process, store, and distribute information. In a sociotechnical perspective, information systems are consist of four components: task, people, structure (or roles), and technology.

iii) **Chatbot:** A chatbot is a software application used to conduct an on-line chat conversation via text or text-to-speech, in lieu of providing direct contact with a live human agent. In addition, a chatbot is a type of software

that can automate conversations and interact with people through messaging platforms.

iv) **Fuzzy Logic:** Fuzzy Logic is a branch of machine learning that is being utilized to determine partial truth of a computing process using Boolean value which includes 0 and 1.

v) **Deep Learning:** Deep Learning is a neural network with more than one hidden layers. Deep neural networks facilitate the learning of complex function by a machine through representation-learning method

2.2 Overview of Student Information System

A student information system (SIS), student management system, school administration software or student administration system is a management information system for education establishments used to manage student data. Student information systems provide capabilities for registering students in courses; grade documentation, transcripts of academic achievement and co-curricular activities, and the results of student assessment scores; forming student schedules; tracking student attendance; and managing other student-related data needs in an educational institution. Information security is a concern, as universities house an array of sensitive personal information, making them potentially attractive targets for security breaches, such as those experienced by retail corporations or healthcare providers (Chen, 2016)

Student information systems (SIS) store and track all student information, including grades, attendance records, and more. The software functions as a digital drop box for school-related information. SIS software has become a vital tool for educational institutions as well as parents and students who use it to gain access to student information, make payments, and communicate with school functionaries. SIS products are used by teachers, students, and parents to access all relevant information pertaining to a student's schooling. SIS software is leveraged for a few different functions; the main two being as a channel of communication and as a place to store student information (Danilo et al, 2016)

They key Benefits of SIS Software includes the following:

- Improve management of prospective and enrolled student data
- Increase communication between divisions
- Maintain data of stakeholders when transferring records between departments
- Provide a unified resource location for relevant stakeholders, including alumni, faculty, support staff, and donors
- Standardize data formats among divisions
- Ease the transfer of data to external institutions
- Reduce the time spent on maintaining and organizing student records

SIS software houses many types of student information, consolidating all records in one place so they can be easily accessed by school officials, parents, and the students themselves. In a single system, a school official can view student attendance, financial aid status, class rosters, student enrollment, and more. On the other side, students can see unofficial transcripts, enroll in classes, check tuition fees, and access a schedule builder. Keeping all student information in a single system allows users to make and track changes, as well as maintain a holistic view of both individual students and the student body as a whole. Information in an SIS is not stored in disparate systems, which makes organization easier overall (David and Graham, 2012)

2.3. Chatbot as information communication tool

A chatbot is a software application used to conduct an on-line chat conversation via text or text-to-speech, in lieu of providing direct contact with a live human agent. A chatbot is a type of software that can automate conversations and interact with people through messaging platforms. Designed to convincingly simulate the way a human would behave as a conversational partner. Chatbot systems typically require continuous tuning and testing, and many in production remain unable to adequately converse or pass the industry standard Turing test. The term "ChatterBot" was originally coined by Michael Mauldin (creator of

the first Verbot) in 1994 to describe these conversational programs. Chatbots are used in dialog systems for various purposes including customer service, request routing, or information gathering. While some chatbot applications use extensive word-classification processes, natural language processors, and sophisticated AI, others simply scan for general keywords and generate responses using common phrases obtained from an associated library or database (Panichella et al, 2013)

Most Chatbots are accessed on-line via website popups or through virtual assistants. They can be classified into usage categories that include: commerce (e-commerce via chat), education, entertainment, finance, health, news, and productivity. Interface designers have come to appreciate that humans' readiness to interpret computer output as genuinely conversational—even when it is actually based on rather simple pattern-matching—can be exploited for useful purposes. Most people prefer to engage with programs that are human-like, and this gives chatbot-style techniques a potentially useful role in interactive systems that need to elicit information from users, as long as that information is relatively straightforward and falls into predictable categories (John et al, 2019)

Many high-tech banking organizations are looking to integrate automated AI-based solutions such as Chatbots into their customer service in order to provide faster and cheaper assistance to their clients who are becoming increasingly comfortable with technology. In particular, Chatbots can efficiently conduct a dialogue, usually replacing other communication tools such as email, phone, or SMS. In banking, their major application is related to quick customer service answering common requests, as well as transactional support (Mel et al, 2012)

2.4 Internet of Things as an Embedded Chatbot Tool for Student Information System

The Internet of Things (IoTs) is the interconnection via the internet of computing devices embedded in everyday objects, enabling them to send and receive data. By the Internet of Things, objects recognize themselves and obtain intelligent behavior by making or enabling related decisions taking to the fact that they can communicate information about themselves. These objects can access information that has been aggregated by other things, or they can be added to other services. The Internet of Things is the interconnection of physical objects such as vehicles, home appliances, and other items embedded with electronic software, sensors, and connectivity which enable these objects to connect and exchange data. Secondly, the general concept of the Internet of Things is to effectively manage big data of physical objects on the internet. Internet of Things is a new technology of the Internet accessing. By the Internet of Things, objects have the ability to recognize themselves and obtain intelligence behavior via signaled communication (Frederick et al, 2017)

2.5 Fuzzy Logic as an Embedded Chatbot Tool for Student Information System

Fuzzy logic is a branch of science that is extended to handle the concept of partial truth, where the truth value may range between completely true and completely false as shown in Figure 2.1 and Table 2.1. Fuzzy logic may be applied to many fields, including control systems, neural networks and artificial intelligence (AI). Fuzzy logic can be used to describe how information is processed inside human brains. For example, it can be argued that humans do not know the difference between fat and thin. Five people may be fat and not have the same severity of fatness. Or, one person may appear thin, compared to another, while both are actually fat. Using fuzzy logic, you can assign different logic values for fatness, ranging from 0 to 1, according to severity of fatness. Variables between the extremes of zero and one are closer to the concept of probability, which means there is a major correlation between the science of probability and fuzzy logic. However, fuzzy logic refers to intensity of truth, while probability refers to likelihood. Fuzzy logic is an extension of Boolean logic by Lotfi Zadeh in 1965 based on the mathematical theory of fuzzy sets, which is a generalization of the classical set theory.

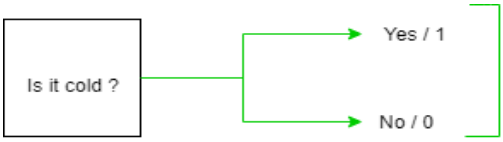


Figure 2.1 Illustration of Fuzzy Logic (**Source:** Mchillson *et al*, 2019)

Table 2.1: Further illustration of Fuzzy Logic (**Source:** Mchillson *et al*, 2019)

If the light is red….	If my speed is high…	And if the light is close…..	Then I brake hard….
If the light is red….	If my speed is low…	And if the light is far…..	Then I maintain my speed…
If the light is orange..	If my speed is average	And if the light is far…..	Then I brake gently…
If the light is green…	If my speed is low…	And if the light is close…..	Then I accelerate….

In fuzzy logic, which is also sometimes called diffuse logic, there are not just two alternatives but a whole continuum of truth values for logical propositions. A proposition can have the truth value 0.4 and a complement value of 0.5. According to the type of negation operator that is used the two truth values must not be necessarily add up to 1. Fuzzy logic has a weak connection to probability theory. Probabilistic methods that deal with imprecise knowledge are formulated in the Bayesian framework, but fuzzy logic does not need to be justified using a probabilistic approach. The common route is to generalize the findings of multi-valued logic in such a way as to preserve part of the algebraic structure (Mchillson *et al*, 2019)

Fuzzy logic can be used as an interpretation model for the properties of neural networks, as well as for giving a more precise description of their performance. It can bel shown that fuzzy operators can be conceived as generalized output functions of computing units. Fuzzy logic can also be used to specify networks directly without having to apply a learning algorithm. An expert in a certain field can sometimes produce a simple set of control rules for a dynamical system with less effort than the work involved in training a neural network. A classic example proposed by Zadeh to the neural network community is developing a system to park a car. It is straightforward to formulate a set of fuzzy rules for the task, but it is not immediately obvious to build and train a network to do the task. Fuzzy logic is now being used in many products of industrial and consumer electronics for which a good control system is sufficient and where the question of optimal control does not necessarily arises. The difference between crisp (i.e., classical) and fuzzy sets is established by introducing a membership function. Consider a finite set

$$X=\{x_1,x_2,...,x_n\} \quad (2.1)$$

which will be considered the universal set in what follows. The subset A of X consisting of the single element x_1 can be described by a 1-dimensional membership vector

$$Z(A) = (1, 0, 0, ...,0) \quad (2.2)$$

where the convention has been adopted that a 1 at the *ith* position indicates that x_i belongs to A. The set B composed of the elements x_1 and x_n is described by the vector

$$Z(B)=(1,0,0,...,1). \quad (2.3)$$

Any other crisp subset of X can be represented in the same way by an n-dimensional binary vector. But what happens if we lift the restriction to binary vectors? In that case we can define the fuzzy set C with the following vector description:

$$Z(C)=(0.5,0,0,...,0) \quad (2.4)$$

In classical set theory such a set cannot be defined. An element belongs to a subset or it does not. In the theory of fuzzy sets we make a generalization and allow descriptions of this type. In our example the element x_1 belongs to the set C only to some extent. The degree of membership is expressed by a real number in the

interval [0, 1], in this case 0.5. This interpretation of the degree of membership is similar to the meaning we assign to statements such as "person x_1 is an adult". Obviously, it is not possible to define a definite age which represents the absolute threshold to enter into adulthood. The act of becoming mature can be interpreted as a continuous process in which the membership of a person to the set of adults goes slowly from 0 to 1. Fuzzy sets are a further development of the mathematical concept of a set. Sets were first studied formally by the German mathematician Georg Cantor (1845-1918). His theory of sets met much resistance during his lifetime, but nowadays most mathematicians believe it is possible to express most, if not all, of mathematics in the language of set theory.

Many researchers are looking at the consequences of' fuzzifying' set theory, and much mathematical literature is the result. For control engineers, fuzzy logic and fuzzy relations are the most important in order to understand how fuzzy rules work. Fuzzy Logic (FL) poses the ability to mimic the human mind to effectively employ modes of reasoning that are approximate rather than exact. In traditional hard computing, decisions or actions are based on precision, certainty, and vigor. Precision and certainty carry a cost. In soft computing, tolerance and impression are explored in decision making. The exploration of the tolerance for imprecision and uncertainty underlies the remarkable human ability to understand distorted speech, decipher sloppy handwriting, comprehend nuances of natural language, summarize text, and recognize and classify images. With FL, we can specify mapping rules in terms of words rather than numbers. Computing with the words explores imprecision and tolerance. Another basic concept in FL is the fuzzy if–then rule. Although rule-based systems have a long history of use in artificial intelligence, what is missing in such systems is machinery for dealing with fuzzy consequents or fuzzy antecedents. In most applications, an FL solution is a translation of a human solution.

Thirdly, FL can model nonlinear functions of arbitrary complexity to a desired degree of accuracy. FL is a convenient way to map an input space to an output space. FL is one of the tools used to model a multi-input, multi-output system. Soft computing includes fuzzy logic, neural networks, probabilistic reasoning, and genetic algorithms. Today, techniques or a combination of techniques from all these areas are used to design an intelligence system. Neural networks provide algorithms for learning, classification and optimization, whereas fuzzy logic deals with issues such as forming impressions and reasoning on a semantic or linguistic level (Alward *et al*, 2017)

2.6. Analysis of Fuzzy Logic Algorithm

Fuzzy logic algorithm is a soft computing paradigm built around human thinking and natural occurrences that offers predicates which are present in nature and similar to those either big or small. This theory simulates human thinking as to how a person makes faster decision. Fuzzy logic is a superset of conventional (Boolean) logic that has been extended to handle the concept of partial truth, and also truth values between "completely true" and "completely false". Furthermore, it can be implemented in hardware, software, or a combination of both. In the present competitive scenario the fuzzy logic system are being adopted by the automotive manufacturers for the improvement of quality and reduction of development time and the cost as well. Fuzzy logic was conceived as a better method for sorting and handling data but has proven to be an excellent choice for many control system applications (Singh and Mishra, 2015).

The potentials and ability of fuzzy logic controls and system to imitate and epitomise human knowledge are strongly determined by guesses and error operator. Singhala, Shah and Patel (2014), opined that fuzzy logic constitutes a non-linear mapping of inputs dataset to a scalar output. Furthermore, they also stated that fuzzy logic basically consist of four components known as fuzzifier, rules, inference engine and defuzzifier. In addition, Gursel (2016) argued that the following fuzzy rules should be infused

into the knowledge base and database of a system.

a) Fuzzifier: This component is responsible for the translation of the fuzzy crisp into fuzzy values. The fuzzifier is responsible for the fuzzification of crisp which is the method of transforming a crisp object into a fuzzy set, to a grade of membership function for linguistic variables of fuzzy sets

b) Knowledge base (Rules): This includes the knowledge and decision rules captured from expert know-how of the application area managing the relations between the fuzzy input and output. The rule base consist of the IF-THEN conditions based on expert knowledge.

c) Inference Engine: It has the uncertain rational intelligence to get the fuzzy output. Human decision making is simulated to constitute the engine. The processing of the fuzzy set is carried out here according to the rules of the rule base.

d) Defuzzifier: Here the fuzzy output is further translated into a crisp value which are more useful and comprehensible values deployed in real world scenario. The crisp output are values constructed by taking into account all parameters in the fuzzy output interval by employing high degree of membership values.

Membership functions are functions that assign a number or value to each element μ(x) of an input space. By implication, it is a function that maps an input value to its membership value.

Therefore, the membership function for a given value ***x*** indicates the degree of its membership to the fuzzy set. There are different forms of membership such as triangular, trapezoidal, Gaussian or singleton. The type of membership function can be context dependent and can be randomly chosen based on user's experience as shown in Table 2.2.

In addition, a fuzzy set is also an extension of classical set characterized by a membership or characteristics function which gives to individual object a grade of membership that ranges between zero and one. A fuzzy set therefore have more than 'either or' methodology for membership. For example, the set considers a set of tall people in the following ways, an individual with the height of 200cm may belong to a set and another of 110 cm does not.

Table 2.2 Fuzzy Logic Algorithm (**Source:** Mchillson *et al*, 2019)

S/No	ALGORITHM	FUZZY LOGIC COMPONENT INVOLVED / ACTION
1	Define linguistic values and terms	Initialization
2	Construct membership function	Initialization
3	Construct rule base	Initialization
4	Convert crisp into fuzzy values using the membership function	Fuzzification
5	Evaluate the rules in the rule base	Inference
6	Combine the result of each rule base	Inference
7	Convert output to non-fuzzy values	Defuzzification

3.1 METHODOLOGY

Many system methodologies are available to structure, plan and control the overall activities involved in the optimization of the existing system or development of the new system. These methodologies combine set of principles, practices and processes that allows the development of systems quickly and properly. This research work on an Enhanced Student Information System Using Chatbot was achieved following the Object-Oriented System Development Methodology (OOSDM). This was aimed at viewing, modeling and implementing conceived system as a collection of interacting classes and objects. OOSDM was adopted

because it is more effective, efficient, reliable, reusable and a faster way of developing systems.

Furthermore, the Object-Oriented System Development Methodology (OOSDM) is a technical approach for analyzing and designing an application, system, or business by applying object-oriented programming as well as using visual modeling throughout the software development process to guide stakeholder communication and product quality.

In addition, the Object-Oriented System Development Methodology (OOSDM) for this research work is diagrammatically illustrated in Figure 3.1 and involves the following phases:

I. Analysis
II. Design
III. Implementation

3.2 Design of the Enhanced Students' Information System

The study developed an Enhanced Students' Information System using Chatbot (Figure 3.1). The chatbot is a function of a hybridized technology (i.e: Fuzzy-Deep Learning). The chatbot is a computer program that simulates human conversation through voice commands or text chats or both. Chatbot, short for chatterbot, is an artificial intelligence (AI) feature that can be embedded and used through any major messaging applications. There are a number of synonyms for chatbot, including "talkbot," "bot," "IM bot," "interactive agent" or "artificial conversation entity." It can only respond to a set number of requests and vocabulary and is only as intelligent as its programming code. The architectural design of the developed student information system is presented in Fig 3.1

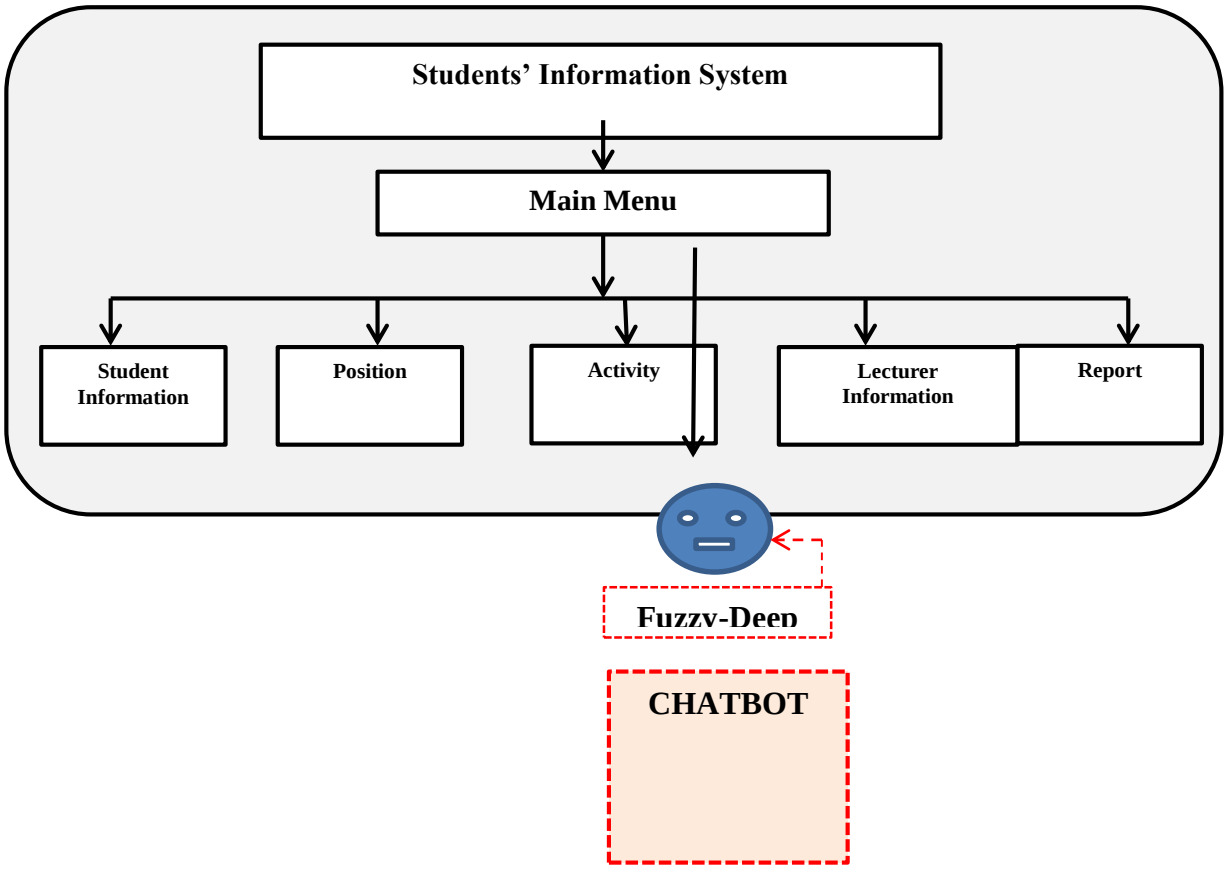


Figure 3.1: Architecture of an Enhanced Students' Information System using Chatbot

The activity model of the enhanced students information system using Chtbot is presented in Figure 3.2. It shows the various activities that takes place in the operation of the system.

Step 1:	Start
Step 2:	Declare Variables
Step 3:	SIS, NUR, UN, PW, UAV IR, SR
	WHERE:
	SIS; Student Information System, NUR; New User Registration, UN;

Figure 3.2: Activity Model of the Enhanced Students' Information System

The data model of the Enhanced Students' Information System is presented in Figure 3.3. It shows the sequence of data movement and processing in the system.

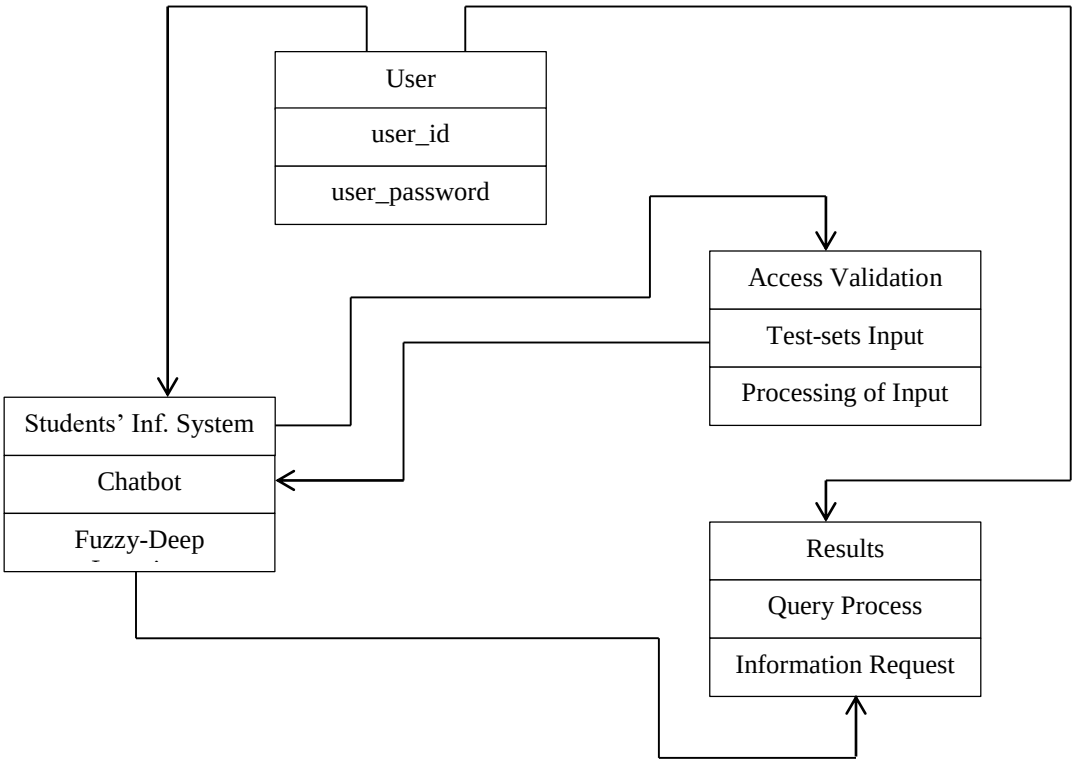


Figure 3.3: Data Model of the Enhanced Students' Information System

3.3.1 Explanation of the Enhanced Students' Information System Components

The purpose of a chatbot system is to simulate a human conversation. Its architecture integrates a language model and computational algorithm to emulate information online communication between a human and a computer using natural language. The following are the components and functions of the enhanced students' information system

(i) Chatbot

This component illustrates a software application that uses artificial intelligence and natural language processing to understand what a human want, and guides them to their desired outcome with as little work for the end user as possible.

(ii) Fuzzy-Deep learning

This component illustrates the combination of fuzzy logic. This combination trains the system to be intelligent and further optimizes performance.

(iii) **Context identification component**: In the context identification unit, the input text is pre-processed to standardize it according to the system's requirements. The proper context is detected based on the keywords used in the text.

(iv) **AIML Response component.** Here, the user attempts to have a normal conversation with the bot and the input is mapped to appropriate pattern in AIML Files. The user then receives the response if it is available

(v) **Query analysis and response component**. Here, upon receiving the personal queries like hey, hello, what are you doing? The input text is analyzed to extract keyword. The user's request for information is understood based on the keywords and the information is retrieved from the database. When a user wants information that he/she needs, that will be provided through this module. If the user's input matches a pattern in the AIML files, the user will receive the appropriate response. If the AIML files do not contain an item for that query pattern, keywords are retrieved from the input. If the sentence is retrieved with confidence >0.5, the answer of that question is return as a response. And if the bot did not understand what the user is given to, it will generate it is understand, give some information like that. Once the user is satisfied with the response which is generated by the bot and dos not wish to chat further, he/she has to say goodbye and terminate the activity. The advantages the Enhanced Students' Information System using Chatbot are:

I. It ensures real time response to all recurring questions.
II. It is available 24 hours
III. The conversation intelligence is personalized
IV. Swift web, mobile, messaging application implementation
V. It eliminates tedious time consuming tasks

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

In this work, we have developed an Enhanced Student Information System using Chatbot. A Chabot is a software application used to conduct an on-line chat conversation via text or text-to-speech, in lieu of providing direct contact with a live human agent. A chatbot can automate conversations and interact with people through messaging platforms. Designed to convincingly simulate the way a human would behave as a conversational partner, Chabot systems typically require continuous tuning and testing. The Enhanced Students' Information System using Chatbot is better than the existing system that was developed by Hashim and Mohammed in 2020, because it provides real time response to all recurring questions. It is available 24 hours since the need for human operation is eliminated.

4.2 Recommendations

In order to improve the management and communication framework in tertiary institutions, the study recommended the application of fuzzy logic to the development of a robust students' information system via the application Chatbot technology. This is because this system provides 24 hours service with minimal or no human interference or operation.

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