Comparative Evaluation of Photovoltaic Energy Potential in Five beaches in Nigeria

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ABSTRACT

In this paper, comparative evaluation of photovoltaic energy potential of five different beaches in Nigeria is presented. The Nigerian beaches considered are Ibeno Beach in Akwa Ibom state, Otuogu Beach in Asaba Delta state, Nkonmo-Oyenghe Beach in Cross River state, Lagos Bar Beach in Lagos state and Port Harcourt Tourist Beach in Rivers state. The metrological data for the five beaches are obtained from NASA SSE website based on the latitude and longitude data of each site. Nalytical expressions are used to determine the actual yearly energy yield, performance ratio and specific energy yield for each of the sites. The results showed that Nkonmo-Oyenghe Beach has the highest ideal yearly energy yield of 1861.5 kWh , the highest actual yearly energy yield of 1475.387 kWh and the highest specific energy yield of 1475.387 kWh/kW_p and the lowest performance ratio of 79.2579%. Also, the actual energy yield at Nkonmo-Oyenghe Beach is about 18% above that at Port Harcourt Tourist Beach which had the lowest yearly energy yield buts highest performance ratio of 80.778 %. The high energy yield at Nkonmo-Oyenghe Beach can be attributed to the high annual average insolation which is about 20 higher than that at Port Harcourt Tourist Beach. In all, the ranking of PV energy potential of the five beaches is as follows; Nkonmo-Oyenghe Beach, Cross Rivers State (1st), Otuogu Beach Asaba, Delta State (2nd), Lagos Bar Beach, Lagos State (3rd), Eket Ibeno Beach, Akwa Ibom State (4th) and Port Harcourt Tourist Beach, Rivers State (5th).

KEYWORDS: Photovoltaic, solar energy potential, performance ratio, specific energy yield, yearly energy yield, peak sun hours, cell temperature

Introduction

As the world clamor for green and renewable energy, researchers seek for ways to make such energy production systems more affordable, more efficient and hence, more economically viable for diverse applications (Izuagie, Asuelime & Sado, 2016; Reddy, Reddy & Padakandla, 2014; Dutta, Bilbao-Osorio & Geiger, 2012; Eisen, 2011; Barroso, Rudnick, Sensfuss & Linares, 2010; Wiser, Bolinger & Holt, 2000). Among the numerous clean and renewable energy systems, photovoltaic (PV) systems have been found to be the fasted growing and most widely adopted option (Wang, 2017; Asif, 2016; Cengiz & Mamiş, 2015; Miller et al., 2014; Gillingham & Tsvetanov, 2014;

Goodrich, James & Woodhouse, 2012; Goodrich, James & Woodhouse, 2012). Particularly, in the developing countries of Africa with adequate solar radiation in most part of the countries, PV power plants becomes the system of choice for powering remote sites that are far away from the grid (Crabtree, et al., 2011; Dincer, 2000). Most often, recreational facilities at sea shores (beaches) in such developing countries like Nigeria are powered by off grid power systems. Again, in such case, PV systems becomes the most viable option given the fact that lower ambient temperature at the sea shore and high wind speed are particularly suitable for high PV power harvesting (Samadhiya & Pandey 2016; Kaldellis, Kapsali & Kavadias, 2014; Schwingshackl et al., 2013; Camacho, Samad, Garcia-Sanz & Hiskens, 2011; Judkins, et al., 2010; Hamrouni, Jraidi & Chérif, 2008; García & Balenzategui, 2004).

According studies, PV power plants' performance depends on numerous parameters that amount to many loss mechanisms (Ekpenyong, Umoren & Markson, 2017; Dobos, 2014; Woyte et al., 2013; Makrides et al., 2012; Breyer & Schmid, 2010). In view of the site dependent PV power system loss, in this paper, the focus is to determine the solar energy potential of five different beaches across Nigeria. This gives insight into the economic viability of such power systems among the different beach sites in Nigeria. First, the comparison is based on the actual average yearly energy yield for PV installation in each of the five beaches studied. In addition to the average yearly energy yield, some site-specific PV module performance meters such as performance ratio (PR) and specific energy yield (SEY) are considered in the comparative analysis of the solar energy potential of the different offshore sites studied in the paper.

The performance ratio, often called "Quality Factor", is the ratio of the electricity generated to the electricity that would have been generated if the plant consistently converted sunlight to electricity at the level expected from the DC nameplate rating (Moradi, Abtahi & Zilouchian, 2017; Sandhu & Nijhawan, 2016; Vasisht, Srinivasan & Ramasesha, 2016; Verma & Singhal, 2015; Erciyas, 2014; Eltawil & Zhao, 2010). PR is, again, a function of both the PV system efficiency and the weather. PR is independent of the irradiation and installation size and therefore it is a useful metric for comparing PV systems and sites. It takes into account all pre-conversion losses, inverter losses, thermal losses and conduction losses. PR metric helps designers to understand which locations will provide the most productive PV plants. For example, a colder site will provide a higher PR, implying more electricity generation if everything else is equal (Dierauf, Growitz, Kurtz, Cruz, Riley & Hansen, 2013; Erciyas, 2014).

Specific energy yield (**SEY**) refers to how much energy (in kWh) is produced for every kWp of module capacity over the course of a typical or actual year (Raugei et al., 2017; Wirth & Schneider, 2015; Luther et al., 2013; Lloyd & Forest, 2010; Sidrach-de-Cardona & Lopez, 1999). **SEY** relates the installed capacity of PV systems to the amount of PV generated electricity (Xoubi, 2015). It is a practical way to calculate the amount of generated electricity based on the installed capacity. SEY is dependent on the irradiation but independent of installation size. **SEY** can be used to give an indication of the efficiency and feasibility of a PV system, to compare PV energy potential of different locations, to analyze different PV system designs as well as to assess the health of an array (Okello, Van Dyk & Vorster, 2015). Finally, based on the presented performance parameters, namely; actual average yearly energy yield, performance ratio and specific energy yield the five different beach sites will be ranked according to their ability to support efficient production of solar energy to the end users.

Methodology

A. Case Study Sites and PV Module Data Collection and Analysis

i. Meteorological Data for the Case Study Sites

In this study five different beaches across Nigeria are considered. The beaches are Ibeno Beach in Akwa Ibom State, Otuogu Beach in Asaba Delta, Nkonmo-Oyenghe Beach in Cross River State, Lagos Bar Beach in Lagos State and Port Harcourt Tourist Beach in Rivers State. The study data location for Ibeno Beach is at latitude of 4.540457 and longitude of 8.002922. The study data for Otuogu Beach is based on the meteorological data extracted at latitude of 6.204612 and longitude of 6.735343; for Nkonmo-Oyenghe Beach the location is at latitude of 6.054546 and longitude of 8.522118; for Lagos Bar Beach it is at latitude of 6.422637 and longitude of 3.411714; for Port Harcourt Tourist Beach it is at latitude of 4.758625 and longitude of 7.044082.

The metrological data for the five study sites are obtained from NASA SSE website based on the latitude and longitude data of each site. Meanwhile, for any given location latitude denoted as $\emptyset$, the optimal PV module tilt angle denoted as β_{opt} can be calculated as:

$$\beta_{opt} = 3.7 + 0.69|\emptyset| \quad (1)$$

where β (^{0}) is the tilt angle, and β_{opt} is the tilt angle, where β, β_{opt} and $\emptyset$ are in degrees.

When global irradiation on a PV module is given as $G(\beta)$ and β is the tilt angle of the PV module then the irradiation on the tilted plane is given as (Ekpenyong, Umoren & Markson, 2017; Lorenzo, 2003);

$$\frac{G(\beta)}{G(\beta_{opt})} = 1 + 4.46 * (10^{-4})(\beta - \beta_{opt}) - 1.19 * (10^{-4})(\beta - \beta_{opt})^2 \quad (2)$$

For any given $G(\beta)$ and β_{opt}, the global irradiation on the optimally tilted PV module is given as $G(\beta_{opt})$ where;

$$G(\beta_{opt}) = \frac{G(\beta)}{\left(1 + 4.46 * (10^{-4})(\beta - \beta_{opt}) - 1.19 * (10^{-4})(\beta - \beta_{opt})^2\right)} \quad (3)$$

So, for the given five beach locations, the optimal tilt angle and optimal global irradiation are computed and the values are shown in Table 1 and figure 1. Particularly, Table 1 shows the latitude, $\emptyset$; optimal tilt angle, β_{opt} (^{0}); annual averaged insolation incident on a horizontal surface, $G(\beta)$ (kWh/m^2/day) and annual average insolation incident on optimally inclined surface, $G(\beta_{opt})$ (Kwh/m2/Day) for the five beaches considered in the study. The data showed that Port Harcourt Tourist Beach in Rivers state has the lowest annual average insolation incident on optimally inclined surface whereas the highest value is obtained at Nkonmo-Oyenghe Beach in sCross Rivers state.

Table 1: The Latitude, Ø; Optimal Tilt Angle, β_{opt} (°); annual averaged insolation incident on a horizontal surface, $G(\beta)$ (kWh/m^2/day) and annual average insolation incident on optimally inclined surface, $G(\beta_{opt})$ (Kwh/m2/Day) for the five beaches considered in the study

Site Name	Latitude	Optimal Tilt Angle (°)	Annual Average Insolation Incident On A Horizontal Surface, $G(\beta)$ (Kwh/m2/Day)	Annual Average Insolation Incident On Optimally Inclined Surface, $G(\beta_{opt})$ (Kwh/m2/Day)
Lagos Bar Beach, Lagos State	6.422637	8.13162	4.73	4.79
Eket Ibeno Beach, Akwa Ibom State	4.540457	6.832915	4.26	4.30
Otuogu Beach Asaba , Delta State	6.204612	7.981182	4.8	4.85
Nkonmo-Oyenghe Beach, Cross Rivers State	6.054546	7.877637	5.04	5.10
Port Harcourt Tourist Beach, Rivers State	4.758938	6.983667	4.2	4.24

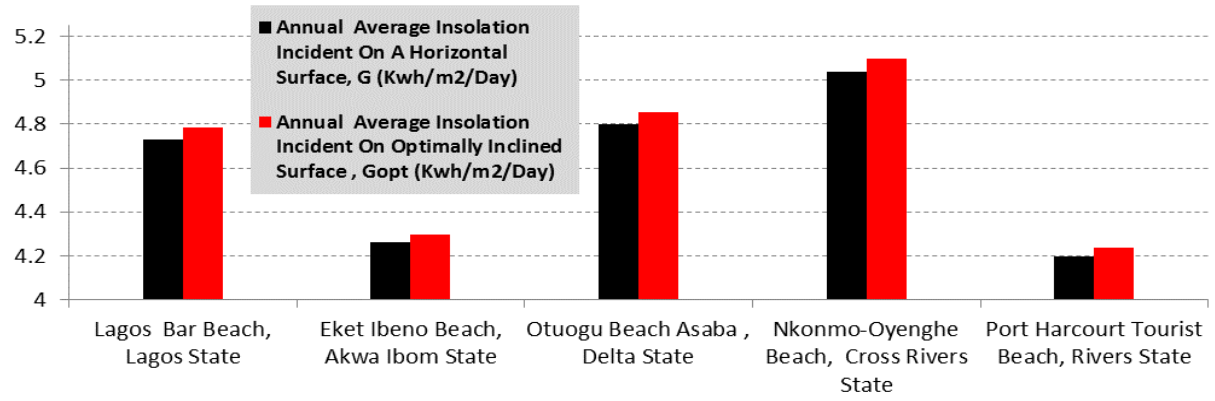

Figure 1: The Annual Averaged Insolation Incident On A Horizontal Surface , $G(\beta)$ (kWh/m^2/day) and Annual Average Insolation Incident On Optimally Inclined Surface, $G(\beta_{opt})$ (Kwh/m2/Day) for the five beaches considered in the study.

For offshore PV installation the equivalent offshore ambient temperature are determined from the onshore data as follows (Umoette, Ubom & Festus, 2016; Al Riza & Gilani, 2014; Ficklin, Luo, Stewart & Maurer, 2012);

$$T_{aS} = 5.0 + 0.75(T_a) \quad (4)$$

Where T_{aS} is sea (or offshore) temperature in °C and T_a is air temperature on land (or onshore air temperature) in °C.

Also, for offshore PV installation the equivalent offshore wind speed are determined from the onshore data as follows (Umoette, et al., 2016; Hsu, 2013; Hsu, 1986);

$$V_{wS} = 1.62 + 1.17\ (V_w) \quad (5)$$

Where V_{wS} = is sea (or offshore) wind speed in m/s and V_w is wind speed on land (or onshore wind speed) in m/s.

The offshore PV cell temperature , $T_{cs}(°C)$ is given as (Umoette, Ozuomba & Okpura, 2017; Muzathik, 2014):

$$T_{cs}(°C) = (0.943[T_{as}(°C)] + 0.095[G(W/m^2)] - 1.528[V_{ws}(m/s)] + 0.3529 \quad (6)$$

Where $T_{as}(°C)$ is ambient temperature in °C; $G(W/m^2)$ is solar irradiance in $W/m^2$and $V_{ws}(m/s)$ is wind speed in m/s. Conversion of insolation value from $Kwh/m^2/day$ to W/m^2 is given as;

$$G(W/m^2) = \frac{G(Kwh/m^2/day)1000}{24} = G(Kwh/m^2/day)(4\ 1.67) \quad (7)$$

So, for the given five beach locations, the annual average air temperature on land, Ta (°C) and on sea, Tas (°C) and the annual average cell temperature, Tcs (°C) on Sea are shown in Table 2 and figure 2.

Table 2: The annual average air temperature on land, Ta (°C) and on sea, Tas (°C) and the annual average cell temperature, Tcs (°C) on Sea

Site Name	Annual Average Air Temperature, Ta (°C) on Land	Annual Average Air Temperature, Tas (°C) on Sea	Annual Average Cell Temperature, Tcs (°C) on Sea
Lagos Bar Beach, Lagos State	25.70	24.28	33.36
Eket Ibeno Beach, Akwa Ibom State	24.60	23.45	32.08
Otuogu Beach Asaba , Delta State	25.30	23.98	34.87
Nkonmo-Oyenghe Beach, Cross Rivers State	24.70	23.53	35.53
Port Harcourt Tourist Beach, Rivers State	25.30	23.98	31.47

The data in Table 2 and figure 2 showed that Eket Ibeno Beach, Akwa Ibom state has the lowest Tas (°C) whereas the highest value of Tas (°C) is obtained at Lagos Bar Beach in Lagos state. However, the highest value of cell temperature, Tcs (°C) is obtained at Nkonmo-Oyenghe Beach, Cross Rivers state whereas the lowest value of cell temperature, Tcs (°C) is obtained at Port Harcourt Tourist Beach, Rivers state.

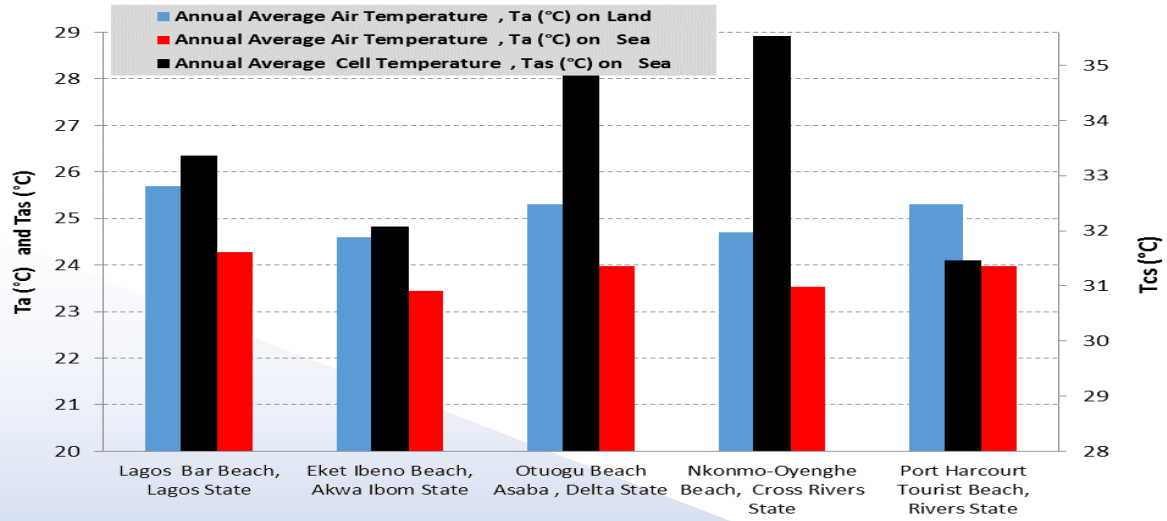

Figure 2: The annual average air temperature on land, Ta (°C) and on sea, Tas (°C) and the annual average cell temperature, Tcs (°C) on Sea

For offshore PV installation the equivalent offshore ambient wind speed are determined from the onshore data as (Hsu, 1986; 1986b; Hsieh, Billy and David, 1993);

$$V_{ww} = 1.62 + 1.17(V_{Wa}) \quad (8)$$

So, for the given five beach locations, the onshore wind speed , $V_w\,(m/s)$ on land and wind speed on sea , $V_{ws}\,(m/s)$ are shown in Table 3 and figure 3. The highest wind speed on land and on sea are obtained at Lagos Bar Beach in Lagos state whereas the lowest wind speed on land and on sea are obtained at Nkonmo-Oyenghe Beach, Cross Rivers state.

Table 3 the onshore wind speed, $V_w\,(m/s)$ on land and wind speed on sea, $V_{ws}\,(m/s)$

Site Name	Onshore Annual Averaged Wind Speed At 10 m Above The Sea Level, Vw (m/s)	Offshore Annual Averaged Wind Speed At 10 m Above The Sea Level, Vws (m/s)
Lagos Bar Beach, Lagos State	3.55	5.7735
Eket Ibeno Beach, Akwa Ibom State	2.75	4.8375
Otuogu Beach Asaba , Delta State	2.7	4.779
Nkonmo-Oyenghe Beach, Cross Rivers State	2.63	4.6971
Port Harcourt Tourist Beach, Rivers State	3.24	5.4108

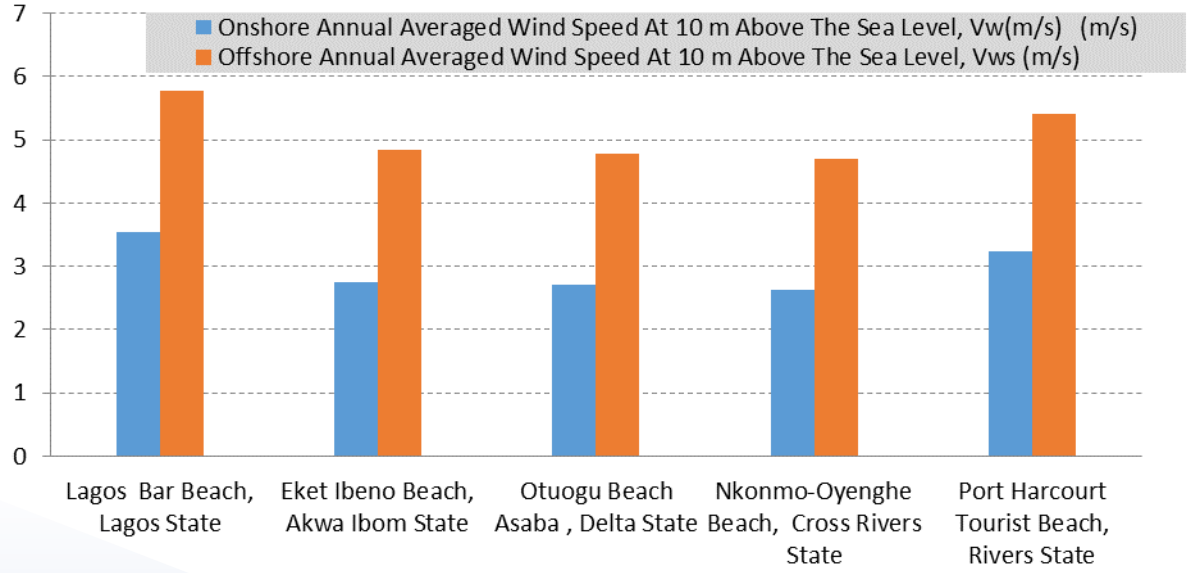

Figure 3: The onshore wind speed, $V_w\,(m/s)$ on land and wind speed on sea, $V_{ws}\,(m/s)$

ii. Data on the Selected the Selected PV Module

In this paper, the PV module selected is the Canadian Solar CS5P-200 (200W) Polycrystalline silicon PV module manufactured by Canadian Solar with nominal power of 200Wp at STC, nominal voltage of 24V, manufacturers tolerance of ± 3%, efficiency

of 11.8%, absorption coefficient of 0.9, temperature coefficient of -0.45%/°C and cell area of 1.609 m^2.

B. Energy Yield of a PV Array

The AC energy output of a PV array is the electrical AC energy delivered to the to the load at the point of connection of the inverter to the load. For solar array with a given peak power rating (kWp) the average yearly energy yield (E_{sys}) can be determined as:

$$\mathbf{E_{sys}} = (\mathbf{P_{TPVSTC}})(\mathbf{f_{man}})(\mathbf{f_{temp}})(\mathbf{f_{dirt}})(\eta_{Inv})(\eta_{PvInv})(\eta_{InvSb})(\mathbf{G_{tilt}}) \quad (9)$$

Where:

E_{sys} = average yearly energy output of the PV array, in watthours

P_{TPVSTC} = total rated PV output power of the array under standard test conditions, in watts

f_{man} = de-rating factor for manufacturing tolerance, dimensionless (refer next section)

f_{temp} = temperature de-rating factor, dimensionless (refer next section)

f_{dirt} = de-rating factor for dirt, dimensionless (refer next section)

G_{tilt} = yearly irradiation value (kWh/m^2) for the selected site (allowing for tilt, orientation and shading)

η_{Inv} = efficiency of the inverter dimensionless

η_{PvInv} = efficiency of the subsystem (cables) between the PV array and the inverter

η_{InvSb} = efficiency of the subsystem (cables) between the inverter and the switchboard

PV absorption coefficient =0.9

The Rated Output Power of The PV Array: Now, let N_{pv} be the number of PV modules in the array and let P_{PVSTC} be the rated PV output power of each of the PV module in the array, then total rated PV output power of all the PV modules in the array denoted as P_{TPVSTC} is given as;

$$P_{TPVSTC} = (N_{pv})(P_{PVSTC}) \quad (10)$$

In this analysis, five (5) of the Canadian Solar CS5P-200 (200W) Polycrystalline silicon PV module is used. Each of the five modules has a rated power of 200 W. Then, $P_{TPVSTC} = (N_{pv})(P_{PVSTC}) = (5)(200W) = 1000W$.

Manufacturers Tolerance De-Rating Factor (f_{man}): For the given manufacturers PV percentage tolerance value, the manufacturers tolerance de-rating factor (f_{man}) is given as;

$$f_{man} = \frac{100 - \text{Manufacturers PV Percentage Tolerance}}{100} \quad (11)$$

Hence, for the given manufacturers PV percentage tolerance of $\pm 3\%$, $f_{man} = \frac{100-3}{100} = 0.97$.

Temperature De-Rating Factor (f_{temp}): For a given temperature coefficient (β), cell temperature (T_{cs}) and standard test condition temperature (T_{STC}) the temperature de-rating factor, dimensionless, f_{temp} is given as follows;

$$f_{temp} = 1 - \left(\left|\frac{\beta\%}{100}\right|(T_{cs} - T_{STC})\right) \quad (12)$$

In this paper, β = -0.45%/°C and $T_{STC} = 25^0C$, hence;

$$f_{temp} = 1 - \left(\left|\frac{-0.45\%}{100}\right|(T_{cs} - 25)\right) = 1 - 0.0045(T_{cs} - 25) \quad (13)$$

Dirt De-Rating Factor (f_{dirt}): The output of a PV module can be reduced as a result of a build-up of dirt on the surface of the module. Given that the power loss due to dirt is 5%, then;

$$f_{dirt} = \frac{100 - \text{power loss due to dirt}}{100} \quad (14)$$

Hence, $f_{dirt} = \frac{100-5}{100} = 0.95$

DC cable Loss Factor or DC Cable Efficiency (η_{PvInv}): The DC energy output of the solar array will be further reduced by the power loss in the DC cable connecting the solar array to the inverter. Given that cable losses for the DC cables is 3%, then;

$$\eta_{PvInv} = \frac{100 - \text{cable losses for the DC cables}}{100} \quad (15)$$

Hence, $\eta_{PvInv} = \frac{100-3}{100} = 0.97$.

Inverter Efficiency (η_{PvInv}): Inverter efficiency is 96% gives η_{Inv}= 0.96

DC cable Loss Factor or DC Cable Efficiency (η_{InvSb}): The AC energy output of the inverter will be further reduced by the power loss in the AC cable connecting the inverter to the load. Given the cable losses for the AC cables are 1%, then;

$$\eta_{InvSb} = \frac{100 - \text{cable losses for the AC cables}}{100} \quad (16)$$

Hence, $\eta_{InvSb} = \frac{100 - \text{cable losses for the AC cables}}{100} = \frac{100-1}{100} = 0.99$.

C. Performance Ratio (PR) Of PV Array Installation

The performance ratio (PR) of PV array installation is calculated as follows:

$$PR = \frac{E_{sys}}{E_{ideal}} \quad (17)$$

here E_{sys} = Actual Yearly Energy Yield from the system.

E_{ideal} = the ideal yearly energy output of the array. E_{ideal} is determined as follows;

$E_{ideal} = (P_{TPVSTC})(G_{tilt})$

Where G_{tilt} = yearly irradiation value (kWh/m^2) for the selected site (allowing for tilt, orientation and shading) and;

$$G_{tilt} = (PSH)(365) \quad (18)$$

Where PSH is the daily Peak Sun Hours (PSH) which is the average daily solar insolation in units of kWh/m² per day. Hence,

$$E_{ideal} = (P_{TPVSTC})(PSH)(365) = (N_{pv})\,(P_{STC})(PSH)(365) \quad (19)$$

$$E_{sys} = (P_{TPVSTC})(f_{man})(f_{temp})(f_{dirt})(\eta_{Inv})(\eta_{PvInv})(\eta_{InvSb})\,(PSH)(365) \quad (20)$$

$$E_{sys} = (E_{ideal})\{(f_{man})(f_{temp})(f_{dirt})(\eta_{Inv})(\eta_{PvInv})(\eta_{InvSb})\} \quad (21)$$

$$PR = \frac{E_{sys}}{E_{ideal}} = \frac{(P_{TPVSTC})(f_{man})(f_{temp})(f_{dirt})(\eta_{Inv})(\eta_{PvInv})(\eta_{InvSb})\,(PSH)(365)}{(P_{TPVSTC})((PSH)(365))} \quad (22)$$

$$PR = (f_{man})(f_{dirt})(\eta_{Inv})(\eta_{PvInv})(\eta_{InvSb})(f_{temp}) \quad (23)$$

D. Specific Energy Yield of PV Array Installation

The specific energy yield (S_{SYE}) of PV array installation is expressed in kWh per kWp and it calculated as follows:

$$S_{SYE} = \frac{E_{sys}}{P_{TPVSTC}} \quad (22)$$

Where E_{sys} = average yearly energy yield in kWh/year and P_{TPVSTC} = total rated PV output power of the array under standard test condition in kWp.

$$S_{SYE} = \frac{E_{sys}}{P_{TPVSTC}} = \frac{(P_{TPVSTC})(f_{man})(f_{temp})(f_{dirt})(\eta_{Inv})(\eta_{PvInv})(\eta_{InvSb})\,(PSH)(365)}{(P_{TPVSTC})} \quad (23)$$

$$S_{SYE} = (365)(f_{man})(f_{dirt})(\eta_{Inv})(\eta_{PvInv})(\eta_{InvSb})\,(PSH)(f_{temp}) \quad (24)$$

$$S_{SYE} = (PR)\,(PSH)(365) \quad (25)$$

Results and Discussions

Table 4: Actual Yearly Energy Yield, (kWh) and Normalised Actual Yearly Energy Yield (%) With Respect to the Lowest Energy Yield

	Actual Yearly Energy Yield, (kWh)	Normalised Actual Yearly Energy Yield, (%) With Respect to the Lowest Energy Yield
Nkonmo-Oyenghe Beach, Cross Rivers State	1475.387	118.02
Otuogu Beach Asaba , Delta State	1407.438	112.58
Lagos Bar Beach, Lagos State	1399.911	111.98
Eket Ibeno Beach, Akwa Ibom State	1264.226	101.13
Port Harcourt Tourist Beach, Rivers State	1250.121	100.00

Table 4 and figure 4 show that Port Harcourt Tourist Beach in Rivers state has the lowest actual yearly energy yield of 1250.121 kWh whereas the highest actual yearly energy yield of 1475.387 kWh occurred at Nkonmo-Oyenghe Beach in Cross Rivers state. The normalised values in Table 4 showed that the yearly energy yield at Nkonmo-

Oyenghe Beach in Cross Rivers state is about 18% more than that at Port Harcourt Tourist Beach in Rivers state.

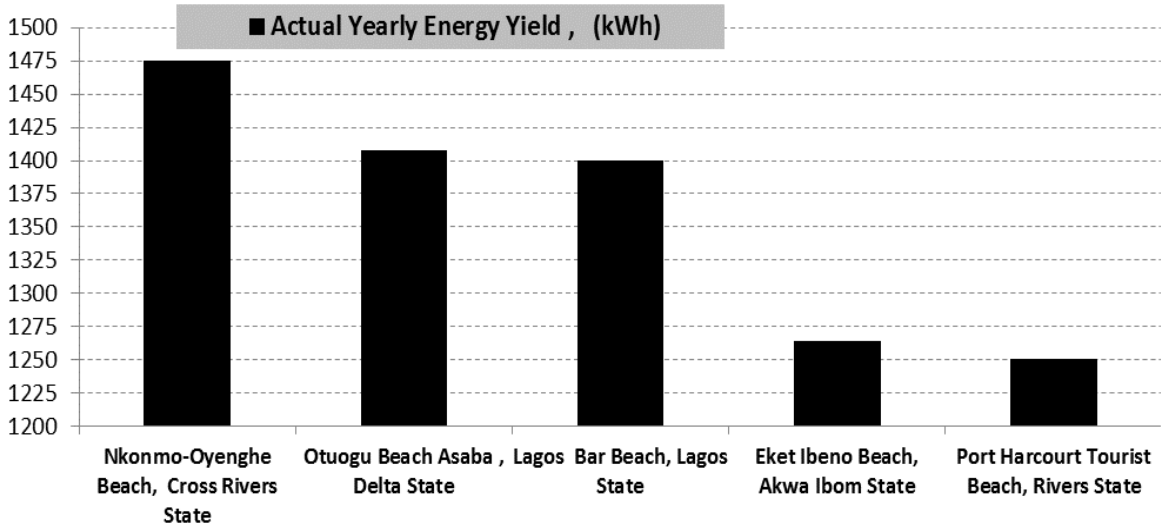

Figure 4: Actual Yearly Energy Yield for the Five Beach Sites

Table 5 shows the total rated PV output power at STC (kW_p), ideal yearly energy, E_{ideal} (kWh), actual yearly energy yield, E_{sys} (kWh), performance ratio, PR (%) and specific energy yield, S_{SYE} (kWh/kW_p). The results in Table 5 show that Port Harcourt Tourist Beach in Rivers state has the highest performance ratio of 80.778% whereas Nkonmo-Oyenghe Beach in Cross Rivers state has the lowest performance ratio of 79.2579%. It means that that the total loss at Nkonmo-Oyenghe Beach is the highest among the five beaches studied. This can be attributed to the highest cell temperature witnessed at the Nkonmo-Oyenghe Beach in Table 2 and figure 2. On the other hand, Table 5 shows that Nkonmo-Oyenghe Beach has the highest ideal yearly energy yield, E_{ideal} (of 1861.5 kWh), the highest actual yearly energy yield, E_{sys} (of 1475.387 kWh) and the highest specific energy yield, S_{SYE} (of 1475.387 kWh/kW_p). Table 4 showed that the actual energy yield at Nkonmo-Oyenghe Beach is about 18% above that at Port Harcourt Tourist Beach whereas in Table 5 and figure 5 the Port Harcourt Tourist Beach has only about 1% improvement in performance ratio over the at Nkonmo-Oyenghe Beach. The high energy yield at Nkonmo-Oyenghe Beach can be attributed to the high annual average insolation incident on optimally inclined PV module, $G(\beta_{opt})$ in (Table 1 and Figure); in this case, the $G(\beta_{opt})$ at Nkonmo-Oyenghe Beach is about 20 higher than that at Port Harcourt Tourist Beach.

Table 5: Total Rated PV Output Power At STC (kW_p), Ideal Yearly Energy, E_{ideal} (kWh), Actual Yearly Energy Yield, E_{sys} (kWh), Performance Ratio, PR (%) and Specific Energy Yield, S_{SYE} (kWh/kW_p)

	Total Rated PV Output Power At STC (kW_p)	Ideal Yearly Energy, E_{ideal} (kWh)	Actual Yearly Energy Yield, E_{sys} (kWh)	Performance Ratio , PR (%)	Specific Energy Yield, S_{SYE} (kWh/kW_p)	Rank
Nkonmo-Oyenghe Beach, Cross Rivers State	1	1861.5	1475.387	79.2579	1475.387	1
Otuogu Beach Asaba , Delta State	1	1770.25	1407.438	79.505	1407.438	2
Lagos Bar Beach, Lagos State	1	1748.35	1399.911	80.0704	1399.911	3
Eket Ibeno Beach, Akwa Ibom State	1	1569.5	1264.226	80.5496	1264.226	4
Port Harcourt Tourist Beach, Rivers State	1	1547.6	1250.121	80.778	1250.121	5

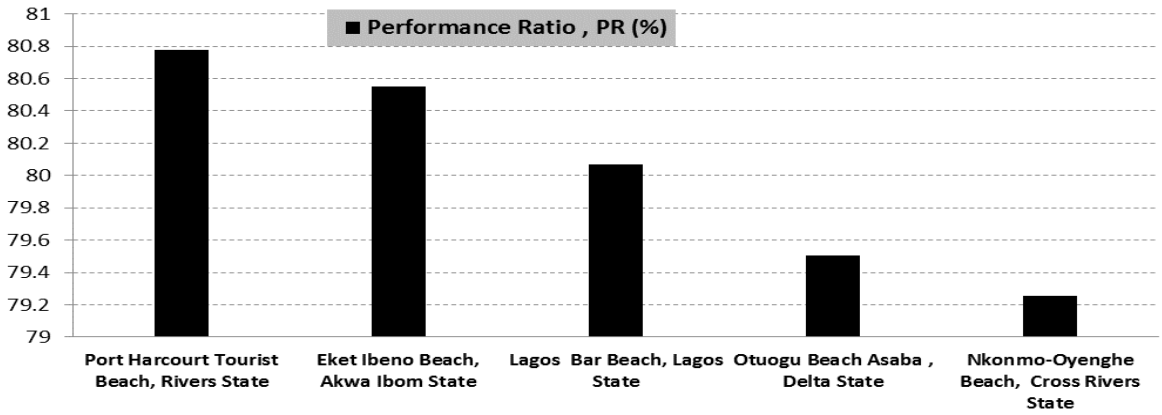

Figure 5: Performance Ratio, PR (%) For The Five Beach Sites

Conclusion

Solar energy potential of five different beaches in Nigeria are determined and compared based on actual yearly energy yield, performance ratio and specific energy yield for each of the sites. The metrological data for the five beaches are obtained from NASA SSE website based on the latitude and longitude data of each site. The five beaches considered are Ibeno Beach in Akwa Ibom state, Otuogu Beach in Asaba Delta State, Nkonmo-Oyenghe Beach in Cross River state, Lagos Bar Beach in Lagos state and Port Harcourt Tourist Beach in Rivers state. The results showed that Nkonmo-Oyenghe Beach has the highest yearly energy yield and the lowest performance ratio. The high energy yield at Nkonmo-Oyenghe Beach can be attributed to the high annual average insolation whereas the low performance ratio can be attributed to the high cell temperature at the site. In all, the much higher value of annual average insolation compared to the other sites made the Nkonmo-Oyenghe Beach to still retain the best site for PV system installation.

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A Critical Analysis of Family Income and Child Development in River State

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ABSTRACT

This study was to assess the family income and child development in River State. The study adopted an ex-post facto design. The study was undertaken in River State. The population of the study consisted of the family head and all experts in home economics in River State. Simple random sampling technique was used to select three senatorial districts in River State. From each of the district 60 family head and 20 home economists were randomly selected, giving the total of 240 respondents that comprised the sample size for the study. The main instrument titled "Family Income and Child Development Questionnaire (FICDQ)". was used for data collection. Face and content validation of the instrument was carried out by an expert to ensure that the instrument was recorded accuracy while Cronbach Alpha technique was used to determine the level of the reliability of the instrument. Interestingly, the reliability coefficient obtained was 0.86 which was high enough to justify the use of the instrument. The researcher subjected the data generated for this study to appropriate statistical techniques such as percentage analysis and simple regression. The test for significance was done at 0.05 alpha level. The study concluded that family income is generally considered the primary measure of a nation's financial prosperity for every child's development. Family income is the flow of money, goods, services, and satisfaction that comes under the control of the family and is used to meet their needs and desires while also fulfilling obligations and family duties. However, child development involves the biological, psychological, and emotional changes that occur in human beings between birth and the conclusion of adolescence. As a result of the utilization of family income, the changes outlined above are critical in any child's development and will have a significant effect on their success as an adult. One of the recommendations made was that families should work to improve their income status in order to aid child development.

KEYWORDS: Family Income, Child Development, and River State

Introduction

Family income and children's development are important topics. It is well documented that children from low socioeconomic status families fare worse in terms of development than their counterparts from more affluent families (Duncan, Ziol-Guest, & Kalil, 2010). Increases in family income substantially reduce differences in schooling outcomes and improve wider aspects of a child's well-being. Child development are most improved by having more money. Conversely, reductions in family income, including benefit cuts, are likely to have wide-ranging negative effects. Money seems to have more of an effect among low-income families. Children in lower-income family tend to fare less well in development and have worse health than their better-off peers. Family Income are part of a complex web of social and economic

conditions that affect child development over a lifetime (Min, Park, Lee, & Min, 2015). These developments include education, family structure, and social policies, as well as culture, health beliefs, and country of origin. Family income may be one of the main contributors to child development.

Increases in the share of family income for child development and the amount they are spending would not necessarily be a bad thing if families were using higher-quality care for their children. However, the findings in this issue brief show that middle-class and low-income working families have less access to licensed child development but must spend a larger share of their income (Pew Research Center 2016). It is important to consider the long-term economic impacts of these findings, as the middle class is shrinking in most metropolitan areas and wage growth is increasingly concentrated among the richest households. A public investment in child development can effectively act as wage increases for millions of middle-class and low-income families, who are often in their lowest earning years as young adults. Palacios-Barrios and Hanson (2019) stated that the family income may also be able to borrow against assets to meet financial obligations. This may attenuate links between family income level and child development. In regard to volatility, as a stabilizer, income may reduce stress from economic uncertainty or income loss, which would weaken negative links between volatility and children's self-regulatory and attentional abilities and, in turn, academic and behavioral development.

Statement of the Problem

Over the years, family income has become part of a complicated network of social and economic factors that influence a child's development. Borrowing against assets to pay financial obligations has been a problem due to family income. Reduced family income, on the other hand, is likely to have a wide range of negative effects on every child's development. However, money appears to have a greater impact on low-income families in Rivers State.

Objectives of the Study

1. To find out the types of family income generated by families in River State

2. To examine the effect of family income on child development in River State

Research Questions

1. What are the types of family income generated by families in River State?

2. What is the effect of family income on child development in River State?

Hypothesis

There is no significant effect of family income on child development in River State.

Conceptual Review

Concept of Family Income

Family income is generally considered a primary measure of a nation's financial prosperity. Family income is the flow of money, goods, services, and satisfaction that

comes under the control of the family and is used to meet their needs and desires while also fulfilling obligations and family duties. According to Varghese, Ogale, and Srinivasan (2005), family income can be defined as the money/purchasing power earned by family members during a specific period of time plus goods and services received or created during that time by the family—goods like vegetables from kitchen gardens, services like teaching children, doing household chores etc. Family income refers to the family's monetary resources, which flow into the family in the form of currency. The various forms in which a family income gains are wages, salaries, interests, bonus, dividends, rent, profit, gifts etc. Family Economics and Consumer Education (2020) stated that family income is the flow that keeps changing from time to time and is received over a period of time. It is an important non-human material resource valued due to its purchasing power over goods and services. Its efficient use harmonizes family living with that of its expected quality of life. Family income considers only households occupied by two or more people related by birth, marriage, or adoption.

Family income means the combined gross earned income and unearned income of all individuals within the family unit. Family income means the sum of a family's annual earnings and cash benefits from all sources before taxes, less payments made for child support (Law Insider, 2021). Family income means cash received at periodic intervals from any source, such as wages, benefits, contributions, or rental property. Family income is the total amount of money earned by every member of a family. Sources of family income include wages, salaries, investment returns, retirement accounts, and welfare payments (Bank Rate 2020). Family income is generally defined as the combined gross income of all members of a family over a specified age. For some usages of the term, individuals do not have to be related in any way to be considered members of the same family. Family income is an important risk measure used by lenders for underwriting loans and is a useful economic indicator of an area's standard of living (Scott & Catalano, 2021). Family income is generally defined as the total gross income before taxes, received within a 12-month period by all members of the family above a certain time. Family income may include wages, salaries, and self-employment earnings; Social Security, pension, and other retirement income; investment income, welfare payments, and income from other sources.

Types of Family Income

Money Income: Money income is the purchasing power in rupees during a given period of time. Money income is one of the important material resources of the family. The money income of the family includes all the earnings that come to the family in terms of rupees, coins, or notes in a specific period of time, daily, weekly, or monthly (Shuani, 2020). This income flows into the family in the form of currency, bank drafts, or cheques. Money income includes all the income received in the form of money, like salary or wages, house rent, gifts, interest earned from bank deposits and other investments (Brainkart 2018). Money is valued by individuals and families because of its purchasing power over goods and services like food, clothing, shelter, educational and medical expenses, etc., some of which are vital for the survival of human beings.

Real Income: Real income is the flow of goods, services, and community facilities available for a specific period of time. The concept of real income is very important for family living. According to Brainkart (2018), families may also receive real income. Real

income is the flow of commodities and services available to families to satisfy their needs and wants. Real income can be classified as direct or indirect.

Direct Income: Direct income refers to those material goods and services available to family members without the use of money. For example, a well-furnished house, a telephone at home, a vehicle for private use, hospital facilities, etc.

Indirect Income: Indirect income refers to those goods and services available to the family that involve the use or exchange of money. It is also the commodities and services received by the family members on payment. For example, vegetables from the kitchen garden. These things can be used by the family or may be sold in the market.

Psychic Income: Psychic income is the flow of satisfaction derived by the family from the use of money income and real income. This income is intangible and qualitative, or subjective. This income is also called "enjoyment income," experienced over a given period of time by the proper utilization of money income and real income (Shuani, 2020). This satisfaction, which people experience, it consists of the mental and emotional satisfaction received from the use of money and real income. It is subjective in nature. To realize such an income, the quality of management plays a vital role.

Concept of Child Development

Child development refers to the process by which a child changes over time. It covers the whole period from conception to an individual's becoming a fully functioning adult. Child development incorporates physical growth as well as intellectual, language, emotional, and social development (University of Nottingham 2020). Child development involves the biological, psychological, and emotional changes that occur in human beings between birth and the conclusion of adolescence. Childhood is divided into 3 stages of life, which include early childhood, middle childhood, and adolescence. According to Dance-Schissel and Chapel (2021), child development refers to the process through which human beings typically grow and mature from infancy through adulthood. The different aspects of growth and development that are measured include physical growth, cognitive growth, and social growth. Child development focuses on the changes that take place in humans as they mature from birth to about age 17. Child development refers to the sequence of physical, language, thought, and emotional changes that occur in a child from birth to the beginning of adulthood. During this process, a child progresses from dependency on their parents/guardians to increasing independence (Kid Sense 2021). Child development is strongly influenced by genetic factors (genes passed on from their parents) and events during prenatal life. It is also influenced by environmental facts and the child's learning capacity.

Child development refers to the biological, psychological, and emotional changes that occur in human beings between birth and the end of adolescence and through adulthood as the individual progresses from dependency to increasing autonomy (SlideShare 2012). The changes above are very important in any child's life and will greatly impact their success, or lack thereof, as an adult. Child development is the growth of perceptual, emotional, intellectual, and behavioral capabilities and functioning during childhood. The term "childhood" denotes that period in the human lifespan from the acquisition of language at one or two years old to the onset of adolescence at 12 or 13 years. Child development that occurs from birth to adulthood

has been largely ignored throughout much of human history. Children were often viewed simply as small versions of adults, and little attention was paid to the many advances in cognitive abilities, language usage, and physical growth that occur during childhood and adolescence (Cherry & Morin, 2020). Child development is the field that involves the scientific study of the patterns of growth, change, and stability that occur from conception through adolescence. Child development is a fundamental part of human development, emphasizing that the brain architecture is shaped in the first years by the interaction of genetic inheritance and the environment in which the child lives.

Stages of Child Development

Children undergo various changes in terms of physical, speech, intellectual, and cognitive development gradually until adolescence. According to Shaikh and Uttekar (2021), experts differ in their division of child development into different stages. Some have described children's development in four stages, five stages, and six stages. Although the number of stages differs, what remains essentially the same are the changes that take place at a particular age or age range. The Christian Child Care Center (2020) noted that the stages of child development may involve cognitive development, social and emotional development, speech and language development, fine motor skill development, and gross motor skill development.

Cognitive Development: Cognitive development is a field of study in neuroscience and psychology focusing on a child's development in terms of information processing, conceptual resources, perceptual skills, language learning, and other aspects of the developed adult brain and cognitive psychology (Wikipedia 2021). Cognitive development means how children think, explore, and figure things out. It is the development of knowledge, skills, problem solving, and dispositions that help children to think about and understand the world around them. Brain development is part of cognitive development.

Social and Emotional Development: Social and emotional development includes the child's experience, expression, and management of emotions as well as the ability to establish positive and rewarding relationships with others (Cohen, 2005). It encompasses both intra- and interpersonal processes. Social and emotional development refers to how children start to understand who they are, what they are feeling and what to expect when interacting with others.

Speech and Language Development: Speech and language development are essential parts of any child's development. Language development impacts your child's social interactions, behavior, and academic skills. According to Peace Health (2021), speech and language are the skills we use to communicate with others. We form these skills during the first years of life. By age 6, most children learn the basics. Try talking and reading to your child often to boost these skills.

Fine Motor Skill Development: Fine motor skills are those that involve a refined use of the small muscles that control the hand, fingers, and thumb. With the development of these skills, a child is able to complete important tasks such as writing, feeding themselves, buttoning, and zippering. Belsky (2020) stated that fine motor skills are the ability to make movements using the small muscles in our hands and wrists. We rely on these skills to do key tasks in school, at work, and in everyday life.

Gross Motor Skill Development: Gross motor skill development involves the large muscles in the arms, legs, and torso. Gross motor abilities also form the basis for fine motor skills and relate to body awareness, reaction speed, balance, and strength. According to Kid Sense (2021), gross motor (physical) skills are those that require whole-body movement and involve the large (core stabilizing) muscles of the body to perform everyday functions, such as standing, walking, running, and sitting upright at a table. They also include eye-hand coordination skills such as ball skills (throwing, catching, kicking), as well as riding a bike or scooter and swimming.

Child development describes the process of children accruing the ability to do increasingly difficult or complex activities as they grow older. Likewise, Shaikh and Uttekar (2021) classified the five stages of child development as:

Newborn: During the first two months of life, newborns react automatically to external stimuli. Newborns can move their heads from side to side, see close-up objects, turn towards sounds and cry to indicate a need. By the third month of life, newborns start to smile at people.

Infant: A lot of new abilities develop quickly by the time a child turns one-year-old. At three to six months of age, infants can recognize familiar faces, begin to babble, control their head movements, and bring their hands together. By six to nine months of age, infants start sitting without support, may bounce when held in a standing position, and respond to people calling their name. Infants start communicating with gestures. Between nine and 12 months old, children can point at things, pick up objects, crawl, and even stand with support. Children can imitate sounds and gestures.

Toddler: When children are between one and three years of age, they can stand alone, learn to walk without help, begin to run and climb stairs with short steps. Children can wave bye-bye, hold a pencil or crayon, draw a circle, learn to say several words, even short sentences, and even follow simple instructions.

Preschool: Between three and five years of age, children's motor skills become refined. Children can throw and catch a ball, skip and hop, learn to dress themselves and draw proper structures, such as a flower. They can speak a complete, long sentence and even two to three sentences at a stretch easily. With toilet training, they begin to go to the toilet in the bathroom and use the facility all by themselves by the age of four years old.

School-age: School-age is the age between six to 17 years old. At this age, children learn to become independent and form their own opinions. Learning, speaking, and writing become well established. Children develop various emotions such as jealousy, love, and many more and can express them through words and gestures. They develop friendships and usually make best friends at this stage. Sexual development around and after puberty makes children interested in dating.

Effect of Family Income on Child Development

Family income have career earnings effects well beyond its effect through child development. Lower-income family may be associated with various events and experiences (e.g., family structure and environment, neighborhood influences and peer influences) that may lead to lower hard or soft skills or fewer connections, which might in turn lead to less ability to obtain better jobs. These effects may operate independently from development (Bartik & Hershbein, 2018). There has been very little

work, to our knowledge, on how childhood poverty (or low family income more generally) affects the return to education, conditional on achieving it, over the whole career and development. Family income and child development could interact because the skills and knowledge obtained through childhood experiences may have complementarity or substitutability with skills causally imparted by education attainment. For example, if a higher-family-income background provides better knowledge of social connections and better soft skills, this may complement better hard skills imparted by the educational system, so that a higher-income background and higher educational attainment together yield greater earnings returns than either would yield separately (Deming 2015). Alternatively, perhaps the educational system teaches students from a low-income background certain soft skill that students from a higher-income background pick up through other channels, so that school can to some extent substitute for family income background. Relations of complementarity between family background and educational attainment would lead to educational returns increasing with higher-income family backgrounds, while relations of substitutability might lead to educational returns declining with higher-income family backgrounds (Brand & Xie 2010). Furthermore, family income background could correlate with empirically measured returns to education not due to true causal effects of education, but rather to how family income background affects who is selected to be educated. For example, low-income students who achieve higher educational attainment could be positively selected, with only the most motivated and talented succeeding in overcoming adversity.

Methods

The study adopted an Ex-Post facto design. The study which was undertaken in River State had all family heads and all experts in home economics in River State as the the population of the study. Stratified random sampling technique was used for the study where 60 family heads and 20 home economists were randomly selected from each of the three senatorial districts, giving the total of 240 respondents that comprised the sample size for the study. The main instrument titled “Family Income and Child Development Questionnaire (FICDQ)” was used for data collection. Face and content validation of the instrument was carried out by an expert to ensure that the instrument was recorded accurately while Cronbach Alpha technique was used to determine the level of the reliability of the instrument. Interestingly, the reliability coefficient obtained was 0.86 and this was high enough to justify the use of the instrument. The researcher subjected the data generated for this study to appropriate statistical techniques such as percentage analysis and simple regression. The test for significance was done at 0.05 alpha level.

Result and Discussion

Research Questions One: The research question sought to find out the types of family income generated by families in River State. To answer the research question percentage analysis was performed on the data (see table 1).

Table 1: Percentage analysis of the types of family income generated by families in River State

TYPES FAMILY INCOME	FREQUENCY	PERCENTAGE
MONEY INCOME	112	46.67**
REAL INCOME	73	30.42
PSYCHIC INCOME	55	22.92*
TOTAL	**240**	**100%**

** The highest percentage frequency
* The least percentage frequency
SOURCE: Field survey

The above table 1 presents the percentage analysis of the types of family income generated by families in River State. From the result of the data analysis, it was observed that "Money Income" (46.67%) rated the highest percentage of the types of family income generated by families. This was seconded by "Real Income" (30.42), while "Psychic Income" (2.22%) rated the least percentage of the types of family income generated by families in River State.

Research Questions Two: The research question sought to find out the effect of family income on child development in River State. To answer the research percentage analysis was performed on the data (see table 2).

Table 2: Descriptive statistics of the effect of family income on child development in River State

Variable	N	Arithmetic mean	Expected mean	R	Remarks
Child Development	240	16.89	12.5	0.63	*Moderately Strong Relationship
Family Income		13.87	12.5		

Source: Field Survey

The above table 2 presents the result of the descriptive analysis of the effect of family income on child development in River State. The two variables were observed to have moderately strong relationship at 0.63%. The arithmetic mean for child development (16.89) was observed to be greater than the expected mean score of 12.5. In addition to that, the arithmetic mean as regards family income (13.87) was observed to be higher than the expected mean score of 12.5. The result therefore means that there is remarkable effect of family income on child development in River State.

Hypothesis Testing

Hypothesis One

The null hypothesis states that there is no significant effect of family income on child development in River State. In order to answer the hypothesis, simple regression analysis was performed on the data (see table 3)

Table 3: Simple Regression Analysis of the effect of family income on child development in River State

Model	R	R-Square	Adjusted R Square	Std. error of the Estimate	R Square Change
1	0.63a	0.40	0.40	1.60	0.40

*Significant at 0.05 level; df= 238; N= 240; critical R-value = 0.139

The above table 3 shows that the calculated R-value (0.63) was greater than the critical R-value of 0.139 at 0.5 alpha levels with 238 degrees of freedom. The R-Square value of 0.40 predicts 40% of the effect of family income on child development in River State. This rate of percentage is highly positive and therefore means that there is significant effect of family income on child development in River State. It was also deemed necessary to find out the effect of the variance of each class of independent variable as responded by each respondent (see table 4).

Table 4: Analysis of variance of the effect of family income on child development in River State

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	412.17	1	412.17	160.34	.000b
Residual	611.80	238	2.57		
Total	1023.96	239			

a. Dependent Variable: Health Status
b. Predictors: (Constant), Food and Nutritional Intake

The calculated F-value (160.34) and the P-value as (.000b). Being that the P-value (.000b) is below the probability level of 0.05, the result therefore means that there is significant effect exerted by the independent variables i.e. family income on the dependent variable which is child development. The result therefore means that there is significant effect of family income on child development in River State. The result therefore is in agreement with the research findings of Bartik, & Hershbein, (2018) who noted that family income have career earnings effects well beyond its effect through child development. Lower-income family may be associated with various events and experiences (e.g., family structure and environment, neighborhood influences and peer influences) that may lead to lower hard or soft skills or fewer connections, which might in turn lead to less ability to obtain better jobs. The significance of the result caused the null hypotheses to be rejected while the alternative was accepted.

Conclusion

The study concluded that family income is generally considered the primary measure of a nation's financial prosperity for every child's development. Family income is the flow of money, goods, services, and satisfaction that comes under the control of the family and is used to meet their needs and desires while also fulfilling obligations and family duties. However, child development involves the biological, psychological, and emotional changes that occur in human beings between birth and the conclusion of adolescence. As a result of the utilization of family income, the changes outlined above are critical in any child's development and will have a significant effect on their success as an adult.

Recommendations

1. Families should work to improve their income status in order to aid child development.
2. Family income should be the key strength that will help to improve the standard of living and children's development in the family.

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Assessment of Patients' Perception of Health Care Services and their Satisfaction

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ABSTRACTS

Patient satisfaction is therefore the perception of patient needs and expectations being met. The level of satisfaction varies from person to person and from product to product or service. A patient is any recipient of health care services that are performed by healthcare professionals. The patient is most often ill or injured and in need of treatment by a physician, nurse, psychologist, dentist, veterinarian, or other health care provider. The paper provided the concept of nursing, noting that it's a profession within the health care sector focused on the care of individuals, families, and communities so they may attain, maintain, or recover optimal health and quality of life. Nurses may be differentiated from other health care providers by their approach to patient care, training, and scope of practice. Nurses practice in many specialties with differing levels of prescription authority. It also gave an explanation of the concept of nursing performance. It was on this basis that the paper concluded that patients are generally satisfied with the quality of nursing services in the renal unit. This was acceptable attendance because it controlled the uremic syndromes and also demonstrated the patients' desire to return for the same treatment, a predictor of level of satisfaction. Causes of dissatisfaction with nursing services, such as an inadequate number of dialysis machines and an inappropriate nurse-patient ratio in the renal unit. Use of the SERVQUAL model depicted nursing services in the rental unit as quality on dimensions of responsibility, reliability, and reassurance. One of the recommendations was that health care providers should ensure that patients need proper care for quick recovery from their physical, mental, emotional, and social health conditions.

KEYWORDS: Patients' Perception, Health Care Services and Satisfaction

Introduction

Patients' satisfaction is basic. Services can be regarded or disregarded by patients depending on the ratings they base them on. A study done in Bangladesh showed that the unavailability of doctors and nurses, their negative attitudes and behaviors, lack of drugs, long travel distances and the waiting times for treatment were major hindrances to the utilization of services in public hospitals (HEU, 2003). Patient outcomes of care are further affected by the rapport and interpersonal quality of practicing professional nurses. The relationship the nurse has with the patient has much more impact, compared to the outcomes regarding normalizing serum biochemical values. This puts emphasis on the point that the nurse has to achieve therapeutic and humanistic outcomes appropriate for each individual patient. According to Nyer (1999), dissatisfied patients tend to file complaints with the establishment or seek redress from it more often and dissuade others from seeking health care services from the system if the systems do not favor them. Studies that help to capture the dissatisfaction before patients turn away from seeking healthcare services are important. A survey carried out at KNH medical wards and Medical

Outpatient Clinics (MOPC) on patient satisfaction encompassing different healthcare staff showed that the patients were generally satisfied with the healthcare services (Nursing Research Committee, 2007). In addition, a survey carried out on patient satisfaction in the KNH pharmacy department in 2009 showed that patients were satisfied with the services but noted the need for improvement. Though these studies had shown satisfaction with the services offered at the hospital, none had been done on the level of satisfaction with nursing services, which are critical in the quality of care a hospital offers, prompting a study in the area (Pharmacy Department, 2009).

Concept of Patient

A patient is any recipient of health care services that are performed by healthcare professionals. The patient is most often ill or injured and in need of treatment by a physician, nurse, psychologist, dentist, veterinarian, or other health care provider. The word "patient" originally meant "one who suffers". This English noun comes from the Latin word patiens, the present participle of the deponent verb, patior, meaning "I am suffering," and is akin to the Greek verb πάσχειν (= paskhein, to suffer) and its cognate noun πάθος (= pathos). This language has been construed as meaning that the role of patients is to passively accept and tolerate the suffering and treatments prescribed by healthcare providers without engaging in shared decision-making about their care (Neuberger, 1999). There are two types of patients, namely:

- ***Outpatients***

An outpatient (or outpatient) is a patient who attends an outpatient clinic with no plan to stay beyond the duration of the visit. Even if the patient will not be formally admitted with a note as an outpatient, their attendance is still registered, and the provider will usually give a note explaining the reason for the visit, tests, or procedure/surgery, which should include the names and titles of the participating personnel, the patient's name and date of birth, signature of informed consent, estimated pre-and post-service time for history and exam (before and after), any anesthesia, medications, or future treatment plans needed, and estimated time of discharge absent any further complications. Treatment provided in this fashion is called ambulatory care. Sometimes surgery is performed without the need for a formal hospital admission or an overnight stay, and this is called outpatient surgery or "day surgery," which has many benefits, including lowering healthcare costs, reducing the amount of medication prescribed, and using the physician's or surgeon's time more efficiently. Outpatient surgery is suited best for healthy patients undergoing minor or intermediate procedures (limited urologic, ophthalmologic, or ear, nose, and throat procedures, as well as procedures involving superficial skin and the extremities). More procedures are being performed in a surgeon's office, termed "office-based surgery," rather than in a hospital-based operating room.

- ***Inpatients***

An inpatient (or in-patient), on the other hand, is "admitted" to stay in a hospital overnight or for an indeterminate time, usually several days or weeks, though in some extreme cases, such as with coma or persistent vegetative state, patients can stay in hospitals for years, sometimes until death. Treatment provided in this fashion is called "inpatient care." Admission to the hospital involves the production of an admission note. The leaving of the hospital is officially termed discharge, and involves a corresponding discharge note and sometimes an assessment process to consider

ongoing needs. In the English NHS, this may take the form of "Discharge to Assess"—where the assessment takes place after the patient has gone home (Bates & Singh, 2018).

Concept of Nursing

Nursing is a profession within the health care sector focused on the care of individuals, families, and communities so they may attain, maintain, or recover optimal health and quality of life. Nurses may be differentiated from other health care providers by their approach to patient care, training, and scope of practice. Nurses practice in many specialties with differing levels of prescription authority (Fort, Deussom, Burlew, Gilroy, & Nelson, 2017). Nurses comprise the largest component of most healthcare environments, but there is evidence of international shortages of qualified nurses. Many nurses provide care within the scope of orders from physicians, and this traditional role has shaped the public image of nurses as care providers. Nurse practitioners are nurses with a graduate degree in advanced practice nursing. They are, however, permitted by most jurisdictions to practice independently in a variety of settings. Since the postwar period, nurse education has undergone a process of diversification towards advanced and specialized credentials, and many of the traditional regulations and provider roles are changing (Coulehan & Block, 2005). Nurses develop a plan of care, working collaboratively with physicians, therapists, the patient, the patient's family, and other team members, that focuses on treating illness to improve quality of life. In the United Kingdom and the United States, clinical nurse specialists and nurse practitioners diagnose health problems and prescribe the correct medications and other therapies, depending on particular state regulations. Nurses may help coordinate the patient care performed by other members of a multidisciplinary health care team, such as therapists, medical practitioners, and dietitians. Nurses provide care both interdependently (with physicians, for example) and independently as nursing professionals (Dunphy & Winland-Brown, 2011).

Concept of Nursing Performance

Nurses spend more time with patients than any other health care provider, and patient outcomes are affected by nursing care quality. Thus, improvements in patient safety can be achieved by improving nurse performance. We review the literature on nursing performance, including cognitive, physical, and organizational factors that affect such performance, focusing on research studies that reported original data from nurse participants. Our review indicates that the nurse's work system often does not accommodate human limits and capabilities and that nurses work under cognitive, perceptual, and physical overloads. Specifically, nurses engage in multiple tasks under cognitive load and frequent interruptions, and they encounter insufficient lighting, illegible handwriting, and poorly designed labels. They spend a substantial amount of their time walking, working long shifts, and experiencing a high rate of musculoskeletal disorders. Research on cognitive processes in nursing, the effects of interruptions on nursing performance, communication during patient handoffs, and situation awareness in nursing is long overdue. Human factors and ergonomics (HF/E) professionals must play a key role in the redesign of the nurses' work system to determine how overloads can be reduced and how the limits and capabilities of performance can be accommodated. Collaboration between nurses and HF/E specialists is essential to improving nursing performance and patient safety.

Review majorly centered on satisfaction level, perception and quality health care, as well as the impact the quality of nursing care has on satisfaction of patients needs. Several terms were operationalized in line with the objectives of the study. Satisfaction level indicated how comfortable one is with the focused goal that is set (Dennis, 2011). Perception was adopted as the act of apprehending by means of the senses or of the mind, the view of something or event or procedure. Quality health care in this study was expressed in two levels:

1. In view of the patient and

2. In terms of SERVQUAL model of quality care based on five dimensions of the model.

Quality health care is described as care that fits one's needs and preferences, does not cause harm, is right for one's illness, and is given without unnecessary delays. Quality healthcare is also the kind of care that includes only the medical tests and procedures one needs. It's fair and is not affected by such factors as gender, language, colour, age, and income. The SERVQUAL model identifies the gap between perception and expectation of customers on the basis of five attributes, viz., reliability, responsiveness, assurance, empathy, and tangibles, to measure consumer satisfaction in light of service quality. SERVQUAL is a service quality framework. The model was refined in the early nineties to the useful acronym RATER, i.e., R: Reliability, A: Assurance, T: Tangibles, E: Empathy, and R: Responsiveness (Parasuraman, Zeitham, & Berryl, 1988).

Patients' Perception and Satisfaction with Quality of Nursing Services

Healthcare systems today are technically proficient. Strong emphasis is placed on patient service with organized efforts to understand, measure, and meet the needs of clients served. Evidence of this phenomenon is found in the numerous publications that focus on patient satisfaction as a key outcome measure in health care. Patient satisfaction is therefore the perception of patient needs and expectations being met. The level of satisfaction varies from person to person and from product to product or service. A number of psychological and physical variables that correlate with satisfaction behaviors, such as return and recommended rate, will influence the level of satisfaction. Donabedian (1988) suggests that "patient satisfaction may be considered to be one of the desired outcomes of care and that information about patient satisfaction should be as indispensable as assessments of quality". Patient satisfaction can be achieved, but can be hindered by several factors. A study done in Italy showed high level of burnout amongst nephrology nurses and physicians, resulting in poor patient satisfaction regarding the quality of services offered. In addition, according to Flynn, Thomas-Hawkins & Clarke (2009), burnout syndrome among nurses affects patient satisfaction as it affects the quality of nursing care. Burnout predictors for nephrology nurses include inadequate staffing, increased workload, and inadequate resources. Further, these burnout predictors are apparent in most health care facilities in Sub-Saharan Africa and could hinder the achievement of patient satisfaction in hospitals. Willis, Watson, Casson, Doherty, Telford & Brown (1998) documented quality issues by patients regarding renal nurses' procedures as, for example, "leaving promptly post dialysis" by some hemodialysis (HD) patients, while other HD patients suggested "commence dialysis session promptly". In South Africa, patients' satisfaction with the quality of care of renal nurses depended upon rapport, the personal quality of the nurse, and the relationship the nurse had with the patient (Department of Nursing Science, 2000). In conclusion, the quality of care provided to end-stage renal disease (ESRD)

patients can be improved through education and a better understanding and appreciation of nursing art (Armistead, 2005).

Perception & Satisfaction with Quality of General Nursing Services including Other Related Health Care Services

The application of a high degree of professionalism and skills in the care of patients enables the achievement of the highest quality of patient care. Armistead (2005) argues that nursing care features have a greater influence on patient satisfaction with healthcare services as compared with other healthcare member interventions. It indicates that the nurse's role includes pre-op teaching, medication administration, record keeping, and physical assessment of patients. Implying the practice of nursing in all these aspects could be described as quality nursing care. The qualities of good nursing have variously been described. For example, oncology patients described attributes of high quality nursing care that contributed to their sense of wellbeing. These attributes included professional knowledge, coordination, partnership, individualization, rapport, and caring (Radwin, 2000). To give high quality care, nurses are expected by patients to be kind, joyful, warm, polite, understanding, and clinically competent. To offer these quality services, nurses therefore need to be clinically competent. According to Baldorsdottir & Jonsdottir (2002), a study established that clinical competence among nurses includes knowing how to give injectables, knowing the pharmacodynamics of drugs, knowing when to refer to the doctor, and knowing how to handle equipment. In addition to these, other attributes have been added. For example, Kralik, Koch, and Wotton (1997) interviewed post-operative patients and identified nursing care attributes that led to patient engagement. These characteristics included the nurse's availability, open dialogue, recognition of the patient as a unique individual, friendly, warm personality, giving a gentle touch, and recognition of the patient as a unique individual. Nurses need to understand the strengths and weaknesses of the services they provide to better serve patients' needs. This is because a patient satisfied with care offered, has a chance of seeking care from the same place it was offered and will likely comply with treatment regimes. According to Vuori (1987), nurses need to understand that care cannot be of high quality unless the patient is satisfied. Patient satisfaction should thus remain a requirement for obtaining health care goals. Professional nurse care found out that patients were concerned about humane treatment as compared with cost and convenience of care. Nursing services and nurse attitudes strongly influenced the patient's satisfaction. It is believed that by measuring patient satisfaction, nurses can identify areas in need of improvement in order to affect quality care. Knowing the causes of dissatisfaction and problems encountered in the provision of nursing services, especially those that may have been prevented, allows healthcare workers to focus on areas in need of improvement.

Conclusion

It was concluded that patients are generally satisfied with the quality of nursing services in the renal unit. This was acceptable attendance because it controlled the uremic syndromes and also demonstrated the patients' desire to return for the same treatment, a predictor of level of satisfaction. Causes of dissatisfaction with nursing services, such as an inadequate number of dialysis machines and an inappropriate nurse-patient ratio in the renal unit. Use of the SERVQUAL model depicted nursing services in the rental unit as quality on dimensions of responsibility, reliability, and reassurance.

Recommendations

1. Health care providers should ensure that patients need proper care for quick recovery from their physical, mental, emotional, and social health conditions.
2. Government and management of each hospital should organize regular training to the medical personnel on effective services to their patients as this will help boost their morale.

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Rebuilding Trust in Home Economics Education for National Development: Imperatives for Academic Ethics and Integrity in Akwa Ibom State

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ABSTRACT

This paper carefully discussed on rebuilding trust in home economics education for national development. The study was conducted in Akwa Ibom State. Needs assessment survey research design was adopted for the study with the population comprising of all home economics experts in Akwa Ibom State. Stratified random sampling technique was used to select fifty (50) home economists from each of the three senatorial districts in Akwa Ibom State which gave the total of one hundred and fifty (150) respondents that constituted the sample size used for the study. The Instrument used in this study for data collection was a questionnaire titled "Home Economics Education and National Development Questionnaire "(HEENDQ)". Face and content validation of the instrument was carried out by an expert in test measurement and evaluation to ensure that the instrument has the accuracy, appropriateness and completeness for the study. Cronbach Alpha technique was used to determine the level of reliability of the instrument. The reliability coefficient obtained was 0.80 and this was high enough to justify the use of the instrument. The researcher subjected the data generated for this study to appropriate statistical techniques such as descriptive statistics for answering the research questions. The paper concluded that home economics education contributes to the development of individuals and families as functioning units of society. In addition, home economics prepares students to use entrepreneurial skills, accept challenges, adjust and adapt in a climate of change, experiment and use creativity, make informed judgments, and apply reasoned action to practical life situations. One of the recommendations made amongst others was that, there is need to reorganize home economics curriculum to have balance between knowledge and skills and values, so that the curriculum become competency based.

KEYWORDS: Home Economics Education, Academic ethics, Academic integrity, & National development

Introduction

The pride of any government is the attainment of a higher value level of development in such a way that its citizens will derive a natural attachment to governance. However, for a nation to be in a phase of development, there must be some pre-requisites, which include socio-political and economic stability. Professional development opportunities for Home Economics educators, such as school division meetings and an annual provincial Home Economics conference, focus on skills-based

activities like cake decorating, pasta making, and sewing project swaps. Apple (2015) argues that the closure, downsizing, and restructuring of home economics programmes have led to fragmentation within the field, leading to a lack of cohesion with regard to the broader goals of the discipline. Critical social and ecological justice pedagogy for home economics requires a supporting curriculum with higher-order thinking outcomes. Lower-order thinking outcomes and pedagogies contribute to the marginalisation of the discipline as the skills-based, hands-on projects seem more engaging and appear to have more value than theory-based activities. This leads to the prioritising of what Apple (2015) refers to as the clichéd skills of cooking, sewing, and design—a common reduction of Home Economics education.

Foster (2013) and McGregor (2016) posit that addressing our current ecological crises means understanding the links between ecological health and broader social stratification issues based on race, class, gender, region, and other variables of inequity. According to Foster, the necessity of addressing ecological sustainability for the sake of survival is inextricably tied to human freedom. Developing a consciousness of the root causes of the issues, finding alternatives to consumer paradigms that hurt people, animals, and the planet, and empowering consumers as citizens to hold governments and corporations accountable for policies that protect our world is the way forward (Foster, 2013; McGregor, 2016). Kumashiro (2015) and Westheimer (2015) agree that teachers should confront students with troubling knowledge to unsettle their understandings, with the goal of recognising paradoxes visible from alternate perspectives. For Home Economics, a major paradox centres on consumerism: we need to purchase items such as food, clothing, and shelter for survival, although this contributes to many injustices to people, animals, and the environment.

Statement of Problem

Today's homes are involved in shaping national development since the lifestyle choices people make in everyday life have a far-reaching impact on both a local and global level. Societies are also changing rapidly, and coming generations will face multiple societal and environmental challenges such as climate change, globalization, poverty, and economic inequalities. Today's educational institutions need to prepare the next generation for the challenges of a constantly changing society and somehow capitalise on the novel pedagogical potential of digitalization. It is on this ground that this paper carefully tries to discuss the effect of rebuilding trust in home economic education for the purpose of national development.

Objectives of the Study

The main purpose of this study was to investigate the effect of home economics education on national development. The researcher puts the people's perception Home Economic under consideration. Specifically, the study sought to:

1. Assess the challenges faced in Home Economics as a practice.
2. Find out the extent to which Home Economics has contributed to national development.
3. To ascertain how to rebuild trust in Home Economics Education.

Research Questions

The following research questions were answered.

1. What are the challenges faced in Home Economics as a practice?
2. To what extent has Home Economics contributed to national development?
3. What strategies can be used to rebuild trust in Home Economics Education?

Research Hypothesis

The null hypothesis states that:

1. There is no significant influence of Home Economics on the national development.

Conceptual Review

Concept of Home Economics Education

Home economics education advocates for positive change in home life experiences for individuals and families. It is the foundation of knowledge, attitudes, and abilities that affect daily decision-making throughout our lives. Students critically examine significant daily concerns in terms of their implications for themselves, their family, and society. Home economics education contributes to the development of individuals and families as functioning units of society. In addition, home economics prepares students to use entrepreneurial skills, accept challenges, adjust and adapt in a climate of change, experiment and use creativity, make informed judgments, and apply reasoned action to practical life situations. Home economics consists of five interdependent areas:

- Human Development
- Food and Nutrition
- Financial Management
- Clothing and Textiles
- Shelter and Housing

Students explore many of the perennial challenges of everyday life. Through a modular approach, students are engaged in experiences that develop attitudes, skills, and understandings essential for the maintenance and improvement of family life as well as national development. Students develop an awareness that personal decisions affect the quality of one's life and those around them. Topics include: child care, clothing care, food and nutrition, money management and consumerism, and personal living space.

Home Economics Intermediate is designed for students to explore the underlying topics in home economics along with the major areas contained within the subject area. By gaining knowledge, insight, and skills related to many of the perennial challenges of everyday life, young people will grow in both confidence and the ability to direct their own futures and achieve healthy lifestyles.

There are six modules to be completed during the intermediate years

- Introductory Module

- Child Care Module
- Clothing Care Module
- Foods and Nutrition Module
- Money Management and Consumerism Module
- Personal Living Space Module

Concept of National Development

National development is a comprehensive term which includes the following: improvement in the living standards of the people; an increase in per capita income; providing social amenities like education, medical care, social services, etc. to the citizens of the country. A nation is a large community of people sharing a common language, common culture, common history, and a common constitution and government. Development is associated with modernization, material advancement, industrialization, scientific and technological progress, the emergence of nuclear energy, the electronic and biological revolution, and new knowledge about man and the universe. It means urbanization, socio-cultural transformation, mass literacy, vertical and horizontal mobility, employment opportunities, and the emergence of specialised and independent occupational roles (Umuru, 2002). For example, Nigeria is a nation and its nationals share common characteristics with a nation, such as binding principles and policies.

The ultimate goal of national development must be to improve the well-being of individuals and bestow benefits on all through self-reliance and mobilisation of domestic resources, transformation of rural production structures, development of small-scale industries, and acquisition of technological and scientific skills. According to Umaru (2008), these objectives are stale, but well-conceived, planned, and directed policies and programmes are required for their realization. This means that development is about self-reliance in every aspect of national life. As soon as individuals are made to acquire specialised skills that will enable them to help develop the nation, the nation will become developed. This accounts for the difference between the developed nations and the underdeveloped nations. According to Alabi (2008), the major factor responsible for the wide gap in the level of development between the so-called developed nations and the developing nations is the level of development of pure and applied science in these nations.

Concept of Academic Ethics

The term "ethics" is generally used to refer to rules and principles of right and wrong conduct. It therefore boils down to morality and good or bad conduct. Academic ethics are the moral codes or the shared standards of an academic enterprise and are at the core of its success (Occidental College, 2016). Basically, academic ethics requires each student to be honest, responsible, fair, respectful, give credit where it is due, turn in their original work, and etc. (Michigan State University, n.d.). Academic integrity requires students to do their own work without unauthorised help from others, cheating, lying, plagiarizing, and stealing. Academic integrity is important because it shows that the student is trustworthy and honest enough to do his or her own work, whether someone is looking or not. The term "ethics" is generally used to refer to rules and principles of right and wrong conduct. It therefore boils down to morality and good or bad conduct.

Concept of Academic Integrity

Academic integrity stands for the ethical policy or the moral code of the realm of academia. Upholding academic integrity is the responsibility of students, researchers, or academicians. Any person related to academics has to be honest in his or her approach, and that should reflect in the fields of research and academic publishing. The person should also be committed to maintaining the highest academic standards in his or her work. Moreover, there should be vehement avoidance of cheating or plagiarism in the individual's works. Thus, academic integrity stands for the way in which a person conducts himself or herself within the domain of academic work. Academic integrity is reflective of the personal integrity of the individual as it involves a moral code and ethical beliefs. According to Dhamdhere (2015), the very central ambition of all academic institutions is to impart and share knowledge among the people of the academic community across the globe. Students who cheat their way to acquire their degree never become knowledgeable.

Challenges Faced in Home Economics as a Practice

The following challenges are common to home economics:

- Lack of finance to buy needed text books
- Inadequate teachers
- Lack of well-equipped laboratories
- Inappropriate and ineffective method of teaching
- Lack of control over the attitude of students and teachers
- Poor management of school

Effect of Home Economics Education on National Development

The road to becoming a developed nation involves a process of change. Development is essentially a forward movement from one state of being to another at a higher level. This movement requires changes in many aspects of life for the individual and their society. The process of change starts with resources, both human and non-human, and ends with human development. This framework revolves around the human dimension, for it is the central force and ingredient in development. It is the people of the nation that initiate the changes, carry out the changes, and benefit from the changes. Non-human resources, for example (natural resources, financial resources, and so on), cannot produce development on their own; they must be used by humans. It is also the people who do the work of changing the systems, the structure, the culture, and even the people themselves, for progress. Finally, development is aspired to for the people. This is the human development paradigm of national development. This is how leaders view national development in the Philippines and its social reform agenda. How does home economics fit into this framework of development? Home economics does not by itself produce the desirable changes necessary for national development to occur. It is the Filipino people, as a nation, who work for the development-oriented changes to come to fruition. Home economics can, however, be a catalyst for change.

In the context of development, a catalyst is any person, thing, organization, or institution that affects the rate of change toward development. A catalyst provokes, speeds up, or slows down the change. Home economics enters into the change process by facilitating progress. "(As) the change agent vibrant with life and energy, (it) lends

impetus to promote and accelerate change for progress." As an agent of change, a catalyst performs these functions:

Stimulus agent

A catalyst can provoke or initiate positive changes in individual or family life, thus speeding up the rate of exchange toward national development. They set new directions for their families for the improvement of their lives. Change is derived from a rational decision to directly affect family life. Home economists "must" take the initiative to effectively solve family problems in order to improve family living, rather than simply adjusting to current plans of living. Home economists have initiated changes in individual and family conditions by:

a. Providing knowledge and skills which can be used by families to improve living conditions (income, health and nutrition);
b. Improving household technology in order for women to have opportunities to earn a living;
c. Campaigning for the recognition of the value and capabilities of women;
d. Home economists assist children, youth and adults especially the women to learn better skills;
e. For accomplishing daily tasks. Emphasis should be given to appropriate training in the knowledge and skills geared towards international competitiveness and sustainable development.
f. It is essential for home economists to become intimately involved in empowering women;
g. Demanding their rights as citizens to economic security through productive activities.
h. Home economists must recognize that the condition of women must be improved, particularly the lack of power of women.
i. Home economists must be intimately involved with the issues and concerns of women. They have control over their own destinies. This includes documenting the conditions of women, advocating change, and ultimately conducting research and practising the profession to the end of helping women and children have a better quality of life. To accomplish long-lasting sustainable development, it is necessary to consider women's involvement in developing, administering, and evaluating the programmes being introduced to help them meet the challenges of their lives.

Home economists assist children, youth, and adults, especially women, to learn better skills for accomplishing daily tasks. Emphasis should be given to appropriate training in the knowledge and skills geared towards international competitiveness and sustainable development. It is essential for home economists to become intimately involved in empowering women, i.e., in demanding their rights as citizens to economic security through productive activities. Home economists must recognise that the condition of women must be improved, particularly the lack of power of women over their own destinies. Home economists must be intimately involved with the issues and concerns of women. This includes documenting the conditions of women, advocating change, and ultimately conducting research and practising the profession to the end of helping women and children have a better quality of life. To accomplish long-lasting sustainable development, it is necessary to consider women's involvement in developing, administering, and evaluating the programmes being introduced to help them meet the challenges of their lives.

How to Rebuild Trust in Home Economics Education

The goal of home economics as a vocational subject is to equip students with all the pertinent practical knowledge and social skills necessary for them to take a productive role in the economy. A teacher of Home Economics education also has the sole responsibility of imparting this knowledge and skills to students in the subject area. The teacher implements the curriculum, motivates learning, facilitates learning, and guides learning in home economics for the benefit of the students and society. Nigeria as a nation has great human and material resources, but it is bedevilled by a number of problems such as underemployment, unemployment, poverty and rapid technological development. The wide spread of poverty, hunger, and unemployment is an enduring problem affecting an estimated 800 million people worldwide, and it is a factor responsible for at least five million deaths each year. Apparently, these problems are connected to the fact that learners are prepared for employment and not necessarily for job creation. Olaitan, Nwachuku, Oyemachi, Igbo, and Ekong (1999) opined that Home Economics has low effectiveness because the programme is not job-oriented but is based on the theoretical foundations of available textbooks and the teachers' background. As long as the majority of Nigerians remain without adequate knowledge and skills needed to develop the various sectors of the economy, unemployment and underdevelopment will prevail. The reality of the situation in our society today is that vocational subjects like Home Economics have not been able to attain this laudable goal of skilled manpower that provides self-employment.

Adequate competencies are needed by graduates of Home Economics in order to be self-employed. Competency is the successful performance of a task through the use of knowledge, skills, attitude, and judgement (Apple, 2015). Competency-based home economics education becomes more important with the need to reduce unemployment and promote self-employment. With competency-based home economics education, home economics students will become more competent and empowered. The competencies needed by students, when possessed and utilized, will help students become self-employed, so learning will be enhanced and poverty reduced. Home economists need to seek to identify competencies needed for improving the teaching and learning of home economics with the view to proffering suggestions that could improve the teaching and learning of home economics. However, trust in home economics education could be restored in the following ways:

- Adequately equipping home economics laboratory for effective learning
- Adequately employing home economics teachers in correct proportion to students.
- Adequately training and retraining teachers to meet up with the current advancement in home economics.
- Equipping students with all the pertinent practical knowledge
- Providing social skills necessary for them to be productive
- Impacting the knowledge and skills in the subject area into students
- Motivating learning by facilitating the learning of Home Economics

- Reorganizing Home Economics curriculum to have balance between knowledge and skills and values and ensure implementation of the curriculum.
- Training students to become self-employed
- Proffering suggestions that can improve the teaching and learning of Home Economics

Methods

The study was conducted in Akwa Ibom State. Needs assessment survey research design was adopted for the study with the population comprising of all home economics experts in Akwa Ibom State. Stratified random sampling technique was used to select fifty (50) home economists from each of the three senatorial districts in Akwa Ibom State which gave the total of one hundred and fifty (150) respondents that constituted the sample size used for the study. The Instrument used in this study for data collection was a questionnaire titled "Home Economics Education and National Development Questionnaire" (HEENDQ). Face and content validation of the instrument was carried out by an expert in test measurement and evaluation from University of Uyo to ensure that the instrument has the accuracy, appropriateness and completeness for the study. Cronbach Alpha technique was used to determine the level of reliability of the instrument. The reliability coefficient obtained was 0.80 and this was high enough to justify the use of the instrument. The researcher subjected the data generated for this study to appropriate statistical techniques such as descriptive statistics for answering the research questions while regression analysis was used in testing the hypothesis. The test for significance was done at 0.05 alpha levels.

Results and discussion

Research Questions 1:

The research question sought to find out the challenges faced in home economics as a practice. To answer the research question, percentage analysis was performed on the data, (see table 1).

Table 1: Percentage analysis of the challenges faced in home economics as a practice

NEEEDS	FREQUENCY	PERCENTAGE
Lack of finance	45	30**
Inadequate teachers	12	8
Lack of well-equipped laboratories	43	28.67
Inappropriate and ineffective method of teaching	9	6
Lack of control over the attitude of students and teachers	7	4.67*
Poor management of school	34	22.67
TOTAL	**150**	**100%**

** The highest percentage frequency
* The least percentage frequency
SOURCE: Field survey

The above table 1 presents the percentage analysis of the challenges faced in home economics as a practice. From the result of the data analysis, it was observed that the highest percentage (30%) of the respondents affirmed that "lack of finance" is the challenge faced in home economics as a practice, while the least percentage (4.67%) of the respondents stated that the challenge faced in home economics as a practice is lack of control over the attitude of students and teachers. The results agree with the findings of Dhamdhere (2015), who stated that there are various common challenges to home economics such as in the table above.

Research Questions 2:

The research question sought to find out the extent to which Home Economics has contributed to national development. To answer the research question, percentage analysis was performed on the data, (see table 2).

Table 2: Percentage analysis of the extents to which Home Economics has contributed to national development

EXTENTS	FREQUENCY	PERCENTAGE
VERY HIGH EXTENT	89	59.33**
HIGH EXTENT	34	22.67
LOW EXTENT	19	12.67
VERY LOW EXTENT	8	5.33*
TOTAL	**150**	**100%**

** The highest percentage frequency
* The least percentage frequency
SOURCE: Field survey

The above table 2 presents the percentage analysis of the extents to which Home Economics has contributed to national development. From the result of the data analysis, it was observed that the highest percentage (59.33%) of the respondents affirmed that the extent to which Home Economics has contributed to national development is very high, while the least percentage (5.33%) of the respondents stated that the extent to which Home Economics has contributed to national development is very low. Moreover, Home Economics education has contributed to the national development in the following ways: by providing knowledge and skills which can be used by families to improve living conditions, improving household technology in order for women to have opportunities to earn a living, campaigning for the recognition of the value and capabilities of women, assisting children, youth and adults especially the women to learn better skills, rendering appropriate training in the knowledge and skills geared towards international competitiveness and sustainable development, empowering women, and demanding their rights as citizens to economic security through productive activities. The results agree with the findings of Matsushima, (1989) who stated that home economics enter into the change process by facilitating progress and as the change agent vibrant with life and energy, lends impetus to promote and accelerate change for progress as well as performing the above functions.

Research Questions 3:

The research question sought to find out the strategies that could be used to rebuild trust in Home Economics Education. To answer the research question, percentage analysis was performed on the data, (see table 3).

Table 3: Percentage analysis of the strategies that could be used to rebuild trust in Home Economics Education

STRATEGY	FREQUENCY	PERCENTAGE
Adequately equipping home economics laboratory for effective learning	23	15.33
Adequately employing home economics teachers in correct proportion to students	21	14
Adequately training and retraining teachers to meet up with the current advancement in home economics	26	17.33**
Equipping students with all the pertinent practical knowledge	17	11.33
Providing social skills necessary for them to be productive	11	7.33
Impacting the knowledge and skills in the subject area into students	14	9.33
Motivating learning by facilitating the learning of Home Economics	6	4
Reorganizing Home Economics curriculum to have balance between knowledge and skills and values and ensure implementation of the curriculum	9	6
Training students to become self-employed	19	12.67
Proffering suggestions that can improve the teaching and learning of Home Economics	4	2.67*
TOTAL	**150**	**100%**

**** The highest percentage frequency**
*** The least percentage frequency**
SOURCE: Field survey

The above table 3 presents the percentage analysis of the strategies that could be used to rebuild trust in Home Economics Education. From the result of the data analysis, it was observed that the highest percentage (17.33%) of the respondents affirmed that the strategy that could be used to rebuild trust in Home Economics Education is by adequately training and retraining teachers to meet up with the current advancement in home economics, while the least percentage (2.67%) of the respondents stated that the strategy that could be used to rebuild trust in Home Economics Education is by

proffering suggestions that can improve the teaching and learning of Home Economics. The results agree with the findings of Apple, (2015) that stated that home economist need to seek to identify competencies needed for improving teaching and learning of Home Economics with the view to proffering suggestions that could improve the teaching and learning of Home Economics and ensure restoration trust of Home Economics Education in the manner found in the above table.

Conclusion

The ultimate goal of national development is to improve the well-being of individuals and bestow benefits on all through self-reliance and mobilisation of domestic resources, the transformation of rural production structures, the development of small-scale industries, and the acquisition of technological and scientific skills. Development is associated with modernization, material advancement, industrialization, scientific and technological progress, the emergence of nuclear energy, the electronic and biological revolution, and new knowledge about man and the universe. Home economics education contributes to the development of individuals and families as functioning units of society. In addition, home economics prepares students to use entrepreneurial skills, accept challenges, adjust and adapt in a climate of change, experiment and use creativity, make informed judgments, and apply reasoned action to practical life situations.

Recommendations

1. Challenging environment that will serve as an impetus for competency and skills improvement by students and teachers of home economics should be created and sustained by the Federal Government through tertiary institutions.

2. There is need to reorganize Home Economics curriculum to have balance between knowledge and skills and values, so that the curriculum become competency based.

3. Soft loans should always be given to Home Economics students on graduation by banks and the government should enable them establish small scale enterprise.

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A Critical Analysis of the Usage of ICT Tools on Social Studies and Students' Academic Performance in Public Secondary Schools in Uyo Local Government Area of Akwa Ibom State

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ABSTRACT

The study determined the relationship between usage of ICT tools on social studies and students' academic performance in public secondary schools in Uyo Local Government Area, Akwa Ibom State. Three research questions and hypotheses were formulated to guide the study. The population of the study comprised all the 5,029 junior secondary three (JSS3) students in the study area. A sample of 200 students were selected from total population. Simple random sampling technique was used to select 5 public schools from the total population of 14 public schools. A self-structured and validated instrument titled "Information Communication Technology Usage Questionnaire (ICTUQ) was used for data collection. Pearson product moment correlation (PPMC) was used in testing the hypotheses at 0.05 significant level an at 198 degree of freedom. The findings of the study revealed and concluded that the application of ICT tools for accessing information has little or no effect on social studies and students 'academic performance. The study recommended among other things that the Akwa Ibom State Ministry of Education in collaboration with the State Secondary Education Board should provide or supply ICT facilities and organize in-service training to teachers on the application of ICT tools, so as to enhance quality and competence in teaching.

KEYWORDS: ICT Tools, Social Studies, Students' Academic Performance, Public Secondary Schools and Uyo Local Government Area

Introduction

Information and communication technologies (ICTs) are electronic technologies used for information storage and retrieval. ICTs within a very short time has become one of the basic building blocks of modern society, with the field of education has been positively affected by ICTs, in terms of adoptions as tools for teaching, learning, and research (Yusuf,2005). A great deal of research has proven the benefits of ICTs usage to the quality of education (Al-Ansari, 2006). Information and technology has a major role to play in forming the new worldwide economy to deliver fast changes in the society. Within the previous decade, ICT has advanced and changed at such a speed, that developing countries have not been able to catch up with the revolution and have been left behind and thus lag in their communication with the developed countries

ICT acts as the foundation stone of the contemporary world; thus, understanding this technology and its fundamental concepts is considered as part of the core of education (UNESCO, 2010). Technology has the potential to innovate the ways of instruction, where and how learning occurs and the roles of student and educators in the instructional process by contributing components of strength to learning situations involving virtual environment. It is an effective and influential instrument for providing

educational opportunities; thus, it is difficult to envision future learning situations that are not bolstered by information and communication technology.

ICT which stands for the information communication technology is an umbrella term that includes any communication device, encompassing radio, television, cellular phones, computer and network hardware, satellite systems, as well as other services such as video conferencing and distance learning. ICTs are often spoken of in a particular context such as ICTs in education, health care, or libraries (Rouse, 2005). ICT (Information Communication Technology) is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and application associated with them, such as videoconferencing and distance learning, "ICTs are often spoken of in a particular context, such as ICTs in education, health care, or libraries" (Abe and Adu, 2010).

The rapid growth in information communication technology (ICT) has brought remarkable changes in our society. The use of ICT is already indispensable in the area of education especially in tertiary and secondary schools. ICTs are the technologies used in conveying, manipulating and storing of data by electronic means. The provide an array of powerful tools that may help in transferring the present isolated teacher-centered and text bound classrooms into rich, student-focused, interactive knowledge environment.

The direct link between the uses of ICT in student's studies has been the focus of extensive literature during the last two decades. While some scholars believe that ICTs improve the student's study habit, others do not support this view. In line with the above, valasidou and Bouzios (2005) stated that students frequently use ICT resources especially internet for their studies, and that internet has huge impact in improving student's study habits. In support of valasiduo and Bouzios (2005) Abdulla, Al–Hawaj, Wajeeh, and Twizell (2008) stated that ICT has the potential to transform the nature of education: where and how learning and teaching takes place and the roles of students and the teachers in the learning process. Karim and Hassan (2006) also noted the exponential growth in digital information has changed the way students perceive study and reading and in how printed materials are used to facilitate study. Leuven (2004) against this view stated that there is no evidence for a relationship between increased educational use of ICT and students' performance. In fact, they find a consistently negative and marginally significant relationship between ICT use and some student achievement measures.

ICT have been utilized in the education since their inception, but they have not always been massively available and deployed in the teaching and learning processes. There are developments in the Nigerian education sector which indicate some level of ICT application in the secondary schools. The federal government of Nigeria, (FRN, 2004) in its national policy on educational recognized the prominent role of ICT in the modern world, and integrated into the teaching and learning processes in Nigeria. To actualize this goal, the document states that government will provide basic infrastructure and training at the primary as well as the junior secondary school system.

Educational institution may utilize ICT to enrich the students with the skills and knowledge for 21st century (Andoh, 2012), such that it can add to worldwide accessibility to education, educational equality, broadcasting of quality teaching

learning programmes, educators' professional growth and to help in obtaining a more effective educational management. Hence, accessibility, inclusion and standard being the key issues of education, can be comfortably addressed through ICT improves the standard of education by encouraging learning through on-going discussion, delayed time discussion, directed instruction, self-learning critical thinking, data seeking and analysis (Yuen Law & Wong, 2010). Utilization of ICT can enhance quality education outcomes, effective instruction, adequate administration of instructional materials and create important abilities in the underprivileged groups (Sharma, 2003), and at the same time influence educational instruction and research process (Yusuf, 2005). It also includes making the following usage possible in the educational system.

The internet is a global network of computers linked together over large distance. Olatokun (2008), opines that internet in education has been used as a tool for researchers to communicate and try to share their research data. Worldwide, the internet has opened myriad new opportunities for students. In reality, it has brought a very open approach on learning, where students are no longer depending on their instructors or textbooks as their only sources of information. The internet allows cost effectiveness in accessing and using both teaching and learning information resources, collaborative and distance education, more than it ever been imagined (Wadi & Sonia, 2004). The internet has countless websites to help teachers develop or improve lessons plans, exchange ideas, obtain information which ultimately may improve their teaching skills.

Bernard and Dulle (2008), observed that limited relevant information resources in the substandard school libraries lead to low level student performance in academics. However, with the internet in trend, students are not any more limited to what is in their libraries. As, a result, the internet widens horizon of students further beyond their local boundaries in terms of information searching. Access and effective use of internet services in secondary schools gives added reading opportunities for students, which in turn supports students' academic performance (Olatokun, 2008),

The digital infrastructure, including individual laptops, is the foundation for a good digital environment (Norwegian ministry of education and research, 2017). Laptop use in education ill increase opportunities for students on several dimensions and affect all subjects. First and foremost, it will give students increased access to programmed that can enhance their learning outcome for example using educational software that corrects grammar or software helping students solve and understand mathematical problems, like the use of GeoGebra.2 in addition, the use of laptop in education would make students able to focus on more complex problems, which in turn can increase students' performance.

During the last ten years, there has been much focus on the place of technology in education (Hatlevik et al., 2013). Already, in 2013 more than 80 percent of second year students in upper secondary education reported that they used laptops always or regularly during class. In August 2017, the Norwegian Government the new digitization strategy for education, which aims to increase technology literacy among the students to make them more equipped to handle the future (Norwegian ministry of education and research, 2017). The strategy states that educational institutions should be in a leading position in digitization as digital literacy will result in better labor market outcomes, and investments in technology at an early stage may increase returns to education drastically. Nigerian government has so far made tremendous efforts in

ensuring the application of ICT in schools. As at September 15, 2016, the Minister of Communications, Barr. Adebayo Shittu reiterated that the government will in no time commence the process of building knowledge Infrastructure Centers equipped with state-of-art ICT facilities across government secondary schools in Nigeria. This was disclosed by the National Information Technology Development Agency (NITDA) in collaboration with National Coding Club.

The new knowledge society is based on exploiting technological advancement (Erstad, 2005). Gaining access to digital tools in education including laptops will, therefore, be important. However, the programme for international student Assessment (PISA) conducted in 70 countries shows that students from countries which have heavily invested in educational information and communications technology (ICT) do not perform better than students in other countries (OECD, 2015b).

The federal ministry of education had launched an ICT- driven project known as school net (www.snng.org) (Federal Republic of Nigeria, 2006; Adomi 2005; Okebukola, 2004), which was intended to equip all schools with computers and communications technologies. In June 2003, at the African Partnership for African Development (NEPAD) launched the e-schools initiative, intended to equip all African high schools with ICT equipment including computers, radio and television sets, phones and fax machines, communication equipment, scanners, digital cameras, and copiers, among other things. It was also meant to connect African students to the internet. The aim of the initiate was to impact ICT skills to young Africans in the primary and secondary schools, and to harness ICT to improve, enrich, and expand education in African countries (Aginam, 2006).

Concerns over educational relevance and quality coexist with the imperative of expanding educational opportunities to those made most vulnerable by globalization are developing countries in general; low-income groups, girls and women, and low-skilled workers in particular. “Global changes also put pressure on all groups to constantly acquire and apply new skills.” The international Labor organization defines the requirements for education and training in the new global economy simply as “basic education for all”, core work skills for all and “lifelong learning for all”. Information and communication technologies (ICTs) which include radio and television, as well as newer digital technologies such as computers and the internet have been touted as potentially powerful enabling tools for education change and reform.

Internet is a computer meditated communication tools, providing the individual with access to a broad spectrum of information and unique communication technologies. The internet is a global system for interconnected computer networks that use the standard internet protocol suite to serve billions of users worldwide. It is a network that consist of millions of private, public, academic, business and government network of local to global scope that are linked by a broad array of electronic, wireless and optical networking technologies.

On the aspect of the use of ICT tools for accessing information, Kulal and Ramesh (2017) conducted a study on role of ICT for accessing e-resources by the Faculty Members and students in Shri MadhwaVadiraja Institute of Technology and Management. Survey method was adopted for data collection through well-structured questionnaire. The questions were randomly distributed among 250 users and 225 (75 from research scholars and 150 from students) valid samples were collected. The

analysis of collected data indicated the significant relevance of internet in accessing information.

In other study conducted by Tamunosemiebi (2012) utilization of Information and Communication Technology (ICT) in user services of Federal University Libraries in south East Nigeria. This study investigated the availability, extent, users' perception, problems and strategies of addressing the challenges of ICT utilization. Five objectives of the study and five research questions were raised to guide the study. A descriptive survey was used for the study, with population of 64 library staff and 12,405 users. All 64 library staff and 400 users constitute the sample, however, 447 (96.3%) constitute the final sample used for the study. The instrument for data collection was observation checklist and questionnaire. In analyzing the data, descriptive statistic such as mean scores and tables was used. The finding revealed that a number of ICT facilities are at different levels of availability in the University libraries under study. It also shows that ICT tools such as E-mail, subject gateways, e-journals, e-books are extensively used to provide references services, in terms of bibliographic tools; CD-ROMs and online databases are widely used. It is further shows that users' perception is that ICT utilization is beneficial, as its aids in enhancing research. Various problems ranging from inadequate budget for ICT facilities, inadequate infrastructure, lack of up-graded ICT skills level of users, inadequate qualified staff in libraries, software and hardware problems are shown to hinder ICT utilization.

On the aspect of ICT for information storage, Rexwhite, Doreen and Akpovoca (2013) conducted a study on the use of databases for information storage and retrieval in selected banks in Delta state. The study was aimed at investigating the use of databases in information storage and retrieval in some selected banks in Delta state, Nigeria. Variables to support the study were reviewed under the following areas: concept of information, concept of databases, concept of information storage and retrieval, role of ICT in information storage and retrieval, and challenges of effective and retrieval. A descriptive survey research was used and data was collected through the use of questionnaire. 92 copies of questionnaire were administered and retrieved back from respondent's statistical tools of simple percentage and frequency count s was used for analysis. Research findings revealed that: parent bodies of banks are the sole source of funding the use of databases in the selected banks of delta state, that these are adequate skilled ICT personnel for rendering services through the storage and retrieval of information/data at the bank. There are ICT software and hardware facilities used for the storage and retrieval of data/information in the bank industry.

Obioha (2005) investigate the roles of ICT in information seeking and storage among research officers in research institutes in Nigeria. The paper case studies the Nigeria Institutes for Oceanography and Marine Research, Lagos using questionnaires, interview, and personal observation and examining relevant records. One hundred and seventy-two research officers of the institute were sampled upon. The study examines awareness, use, storage, exposure to ICT, and improvement on ICT tools among other things. Result shows that ICT plays an immense role in information sourcing, generation, processing, storage/retrieval, dissemination and even entertainment. Also, it shows that for ICT to be used optimally band maximally, there is need to have steady/regular power supply, workable/stable infrastructure and provision of more ICT tools and centers.

Abdulwaheed, Paul and Aluand (2016) examined the complimentary role of information communication technology (ICT) in Agricultural Knowledge Management in Nigeria. The research examines the contribution of ICT to Agricultural knowledge management, gathering, storing, retrieving, adopting, localizing and disseminating innovations needed for rural farm families and linkages between research and extension systems. The research focused on the situation in Nigeria and strategies to be adopted for enhancement as well as the challenges related to sharing, exchanging and disseminating agricultural information and knowledge. It is important to note that information dissemination can never be very effective in this present age and era without the use of ICT. Information dissemination is crucial to knowledge management. Information becomes knowledge, exchanging and dissemination are elements in a broader theme known as 'knowledge management'.

It is against this backdrop that the researcher embarked on this study to examine the usage of ICT tools on social studies and students' academic performance in public secondary schools in Uyo Local Government Area, Akwa Ibom State

Statement of the Problem

The use of ICT tools for effective teaching and learning process tends to be absent in most secondary schools in Uyo metropolis, thus the attendant problems of ineffective teaching of social studies and poor academic performance among student. One of the objectives of Nigeria's ICT policy is to integrate ICT into the mainstream of education and to provide training. Notably, most social studies teachers have no or very limited experience and expertise regarding ICT in educational application. This has led to underutilization of ICT facilities in some schools where the facilities are available. According to the African symposium (2011) one of the greatest barriers to proper computer education in several parts of the world is shortage of trained teachers, therefore teachers need to be trained to become sufficiently competent to make personal use of computers, to make use of information and communication technology as a mind tool, to become master of a range of educational paradigms that use ICT, and also to become sufficiently competent to make use of ICT as a tool of teaching.

The inadequacy and utilization of this facility in teaching and learning where available; tends to engender poor academic performance among social studies students in the study area. This is seen in the abysmal failure of students in the study area. This is seen in the abysmal failure of students in the study area. This is seen in the abysmal failure of students in the identified subject area (AKS Ministry of Education). Government has so far made tremendous efforts in ensuring the supply and application of ICT in schools, especially in building Knowledge Infrastructure Centres equipped with state-of-art ICT facilities across government secondary schools in Akwa Ibom State order to improve based on the teachers and students in teaching and learning.

In spite of the effort of government in ensuring availability of ICT for adequate utilization, abysmal performances in social studies among student in secondary school were recorded. It is against this backdrop that the study examines the relationship between internet usages and students' academic performances in social studies in Uyo with the view to elicit current data empirically.

Purpose of the Study

The purpose of the study was to examine the relationship between the usage of ICT tools on social studies and students' academic performance in public secondary schools in Uyo Local Government Area, Akwa Ibom State. The study specifically sought to;

1. To examine ICT use for accessing information and students' academic performances.
2. To examine ICT use for information storage and students' academic performances.
3. To determine the ICT use for transferring information and students' academic performances.

Research Questions

The study is guide by the following question;

1. What is the relationship between the application of ICT tools for accessing information on social studies and student s' academic performances?
2. What is the relationship between the application of ICT tools for information storage and students' academic performances?
3. What is the relationship between the application of ICT tools for transferring information and students' academic performances?

Research Hypotheses

The following null hypotheses were formulated to guide the study

1. There is no significant relationship between the application of ICT tools for accessing information on social studies and students' academic performances.
2. There is no significant relationship between the application of ICT tools for information storage and students' academic performances.
3. There is no significant relationship between application of ICT tools for transferring information and students' academic performances.

Methodology

A correlational research design was used in the study. The study was conducted in Uyo Local Government Area. The population of the study comprised all the 5,029 junior secondary three (JSS3) students in the study area. A sample of 200 students were selected from total population. Simple random sampling technique was used to select 5 public schools from the total population of 14 public schools. A self-structured instrument titled "Information Communication Technology Usage Questionnaire (ICTUQ) was used for data collection. The instrument was validated by two experts in the Department of Educational Foundations through face and content validity. Cronbach Alpha technique was used to determine the level of reliability of the instrument. The reliability coefficient obtained was 0.71 and this was high enough to justify the use of

the instrument. Pearson product moment correlation (PPMC) was used in testing the hypotheses at 0.05 significant level an at 198 degree of freedom.

Results and Discussion

Hypothesis 1: There is no significant relationship between the application of ICT tools for accessing information on social studies and students' academic performances.

TABLE 1: Pearson Product Moment Correlation analysis of the relationship between the application of ICT tools for accessing information on social studies and students' academic performances. (N = 200)

Variables	N	∑X ∑Y	∑X² ∑Y²	∑XY	r-value	r-crit	Decision
Application of ICT tools for accessing information		4646	94695				
	200			140514	0.051	0.064	*
Students' academic performance		7148	94636				

***p<05; df = 198; Critical r = 0.064**

The data in Table 1 shows that there is no significant relationship between the application of ICT tools for accessing information on Social Studies and students' academic performance. This is supported by the calculated r-value of 0.051 wi5th the degree of freedom of 198 which is less than the critical r-value of 0.064 at 0.05 level of significance. Hence, there is no statistically significant relationship between application of ICT tools in accessing information on Social Studies and students' academic performance. The null hypothesis is accepted.

Hypothesis 2: There is no significant relationship between the application of ICT tools for information storage on social studies and students' academic performance.

TABLE 2: Pearson Product Moment Correlation analysis of the relationship between the application of ICT tools for information storage on social studies and students' academic performance. (N = 200)

Variables	N	∑X ∑Y	∑X² ∑Y²	∑XY	r-value	r-crit	Decision
Application of ICT tools for information storage		4605	93785				
	200			138763	0.056	0.064	*
Students' academic performance		7148	94636				

***p<05; df = 198; Critical r = 0.064**

The data in table 2 shows that there is no significant relationship between the application of ICT tools for information storage on Social Studies and students' academic performance. This is support by the value of the calculated r-value 0.056 with the degree of freedom of 198 which is less than the critical value of 0.064 at 0.05 level of significance. Hence, there is no statistically significance relationship between

application of ICT tools for information storage on Social Studies and students' academic performance. The null hypothesis is accepted.

Hypothesis 3: There is no significance relationship between the application of ICT tools in transferring information on social studies and students' academic performance.

TABLE 3: Pearson Product Moment Correlation analysis of the relationship between the application of ICT tools in transferring information on social studies and students' academic performance. (N = 200)

Variables	N	∑X ∑Y	∑X² ∑Y²	∑XY	r-value	r-crit	Decision
Application of ICT tools for transferring storage		4644	22201				
	200			140243	0.061	0.064	*
Students' academic performance		7148	94636				

*p<05; df = 198; Critical r = 0.064

The data in Table 3 shows that there is no significant relationship between the Application of ICT tools for transferring information in Social Studies and Students' Academic Performance. This is supported by the value of the calculated r-value 0.061 with the degree of freedom of 198 which is less than the critical r-value of 0.064 at 0.05 level of significance. Hence, there is no statistically significant relationship between application of ICT tools for transferring information in Social Studies and Student Academic Performance. The null is accepted.

Discussion of Findings

The relationship between application of ICT tools for accessing information on social studies and students' academic performance. The finding revealed that the calculated r-value of 0.051 was less than the critical r-value of 0.064 of the 0.05 significant levels with 198 degree of freedom, hence the null hypothesis was accepted, which implies that there is no significant relationship between accessing information on social studies and students' academic performance in the secondary school in UYO LGA.

The finding however indicated that students' academic performance in social studies does not depend on the use of ICT tools for accessing information. This is in agreement with Leuven (2004) study that there is no evidence for a relationship between increased educational use of ICT for accessing information and marginal significant relationship between ICT uses for accessing information and some students' achievement measure in the secondary schools. Contrary to the above finding, Kulal and Ramesh (2017) posited that application of ICT tools for accessing information was significantly related with students' performance especially in the area of accessing recent empirical studies for projects.

The relationship between application of ICT for information storage and students academic performance. The finding revealed that calculated r-value of 0.056 was less than the critical r-value of 0.0064 at the 0.05 significant levels with 198 degree of freedom. Hence, the null hypothesis is accepted. This implies that there is no significant relationship between information storage and students' performance in the social

studies in the Secondary Schools in Uyo LGA. This may be as a result of inadequate facilities in the studies by Rexwhite, Dorean and Akpovoka (2013) which indicated significant relationship between ICT tools use for information storage in the banking sectors. The relationship between application of ICT tools for transferring information and students' academic performance.

The finding revealed that calculated r-value of 0.061 was less than the critical r-value of 0.064 at the 0.05 significant levels with 198 degree of freedom. Hence, the null hypothesis was accepted. The implication is that there is no significant relationship between transferring information and students' academic performance in social studies in the Secondary Schools in Uyo LGA. The findings showed that application of ICT tools for transferring information has nothing to do with students' academic performance in social studies in the Secondary Schools in Uyo LGA.

The finding is in line with an earlier study by Efe (2016) who found low level of utilization of ICT. The reasons for low level automation were attributed to lack of funds, faulty equipment and obsolete computer systems. The finding is contrary to the study of Abdulwasheed, Paul and Aluand (2016) which revealed ICT usage as effective for sharing, exchanging and disseminating of agriculture information and knowledge.

Conclusion

Based on the findings of the study, it was concluded that the application of ICT tools for accessing information has little or no effect on social studies and students 'academic performance.

Recommendations

Based on the finding of the study and the conclusion drawn, the following recommendations were made:

1. Akwa Ibom State Ministry of Education in collaboration with the State Secondary Education Board should provide or supply ICT facilities and organize in-service training to teachers on the application of ICT tools, so as to enhance quality and competence in teaching
2. The state Government should ensure full Integration of ICT facilities in teaching and learning process for storage of storage of relevant class lesson and practices
3. Other Stakeholder in Education should be involved in building operation and transfer policy for sustainability of ICT service in the school system.

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The Determinants of Human Resources Management Practices in Multinational and Indigenous Construction Firms in Akwa Ibom State

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ABSTRACT

This study assessed the determinants of human resources management practices in multinational and indigenous construction firms in Akwa Ibom State. This study adopted a survey research design. The study was conducted in Akwa Ibom State. The population of the study referred to specific elements of interest in a study. The elements of interest in this study are targeted professionals. The sampling frame for this study consists of large and medium MCFs and ICFs executing public projects within the study area. Therefore, the sample size for this study is sixty-two (62) construction firms. This study adopted both primary and secondary data collection tools. Data obtained from respondents was analyzed using Percentages, mean item score to analyses respondents' ranked opinions based on the 5-point Likert scale. All hypotheses were tested at 0.05 level of significance. The study concluded that Human Resource Management is very complicated subject in which standardized practices cannot be implemented and followed. This is so because human beings possess varying degree of psychological behaviors, skills, expertise, emotions, motivation levels, loyalty and desire for professional growth. There is a strong relationship between good HRM practices and workers' productivity in construction firms in Akwa Ibom State. This shows that workers will be committed in construction firms where HRM practices are effective. The result indicated that a firm where HRM is characterized by inconsistencies and deployment challenges, workers' productivity will be low. It is also concluded that there is significant difference in HRM practices of indigenous construction firms (ICFs) and that of multinational construction companies (MCFs) in the study area. Finally, there is significant difference in workers' productivity between indigenous and multinational construction firms. One of the recommendations made was that the construction organizations in Akwa Ibom State should embark on a serious employee training campaign in order to get more from her workers.

KEYWORDS: Human Resources Management, Multinational, Indigenous, Construction Firms and Akwa Ibom State

Introduction

The global construction industry is dubbed labour intensive. This trend has not shifted despite advancements in technology that promote development in prefabrication and automation of construction products and processes (Langford & Male, 2001). Human resources, therefore, drive the operation and functionality of this all-important sector. Despite this pivotal role, the construction industry is affected by poor performance and lower productivity. Kokkaew and Koompai (2012) attribute these outcomes to difficulty associated with human resources (HR). Conventional practices embrace human resource management (HRM) as an inclusive yardstick for productivity

improvement, which was traditionally a function within the personnel management units of conventional firms (Anderson & Woodhead, 2005). HRM refers to the process of determining a course of action and the allocation of resources to facilitate the pursuit of set goals in acquiring workers, preparing them for work, overseeing their performance, and providing compensation. Despite these publicized advantages, the level of use of this practice within the construction sector remains widely unknown. Its application in other sectors of the global economy is well documented.

Huemann, Keegan, and Turner (2007) studied the context of HRM practice within the construction sector and other industries. This study found that project management strategy, the temporary nature of construction products, dynamism, project portfolio, and management paradigm affect the use of HRM in the construction industry. A study by Loosemore, Dainty, and Lingard (2003) found that the male-dominant setting of the construction industry also impacts significantly on HRM practices. Tabassi & Bakar (2008) studied HRM in Iran and found that training and motivation of employees are major obstacles to its effective deployment. The construction industry in Nigeria is an upcoming industry, a sector regarded as a catalyst for growth, while its performance serves as an indicator for the nation's economy. However, a study that relates HRM practices to workers' productivity in Nigeria is not apparent; a need therefore exists to explore the correlation between HRM practices and workers' productivity in Nigeria. This is directed towards filling a literature dearth in this aspect, and the need to stimulate improvement in productivity through HRM practices.

Statement of the Problem

Human resources management and productivity are widely considered concepts in the overall analysis of industrial success. Pfeffer (1994) noted that in order to achieve organizational goals and enhance productivity, flexible and capable workers play a crucial role. As a result, it is important that a construction firm adopts HRM practices that make the best use of its workers. HRM is the most important function in all organizations. It contributes to the success of the organization and creates a competitive advantage for it. Construction-Based Organizations (CBO) exert pressure on the workers by the very nature of their dynamic work environment, which may affect their productivity, project performance, and delivery. One of the main causes of project failure is the lack of effective HRM practices (Schmid & Adams, 2008). The HRM practices-ways of handling workers' welfare issues, recruitment and selection, training and development, human resource (HR) planning and workers' skills may determine how the worker copes with temporary work structures that make workers uncertain about their future and lead to reduced productivity and thus poor project delivery.

Objectives of the Study

1. To find out the factors that influence HRM practices in Akwa Ibom?
2. To examine the HRM practices between multinational and indigenous construction firms in Akwa Ibom State?

Research Questions

1. What are the factors that influence HRM practices in Akwa Ibom?

2. Does HRM practices differ between multinational and indigenous construction firms in Akwa Ibom State?

Hypothesis

There is no significant difference between HRM practices of Indigenous and multinational construction firms.

Literature Review

Evolution and Concept of Human Resource Management

Human resource management (HRM) is the practice of recruiting, hiring, deploying, and managing an organization (Chai, 2020). No doubt, human society has always been organized into groups for various group objectives. The industrial revolution of the 18th century triggered off what is today's modern HRM. The industrial revolution, which was a technological revolution, brought the factory system instead of the earlier craft system. Machines were invented, and speed was brought into the organization process of getting things done. As Udeze (2000) writes, the major feature of this technological revolution (the industrial revolution) was the invention of machines to perform activities hitherto performed by manual labour. The industrial revolution had deep consequences for management. These were human problems of concentration and technical problems. The human problem was mainly the many people who had to work under one roof in the factory system. The technical problem was associated with how to operate the machines. The second problem of skill acquisition was addressed to a large degree while the human problem was neglected. (Ulrich, 2005). The assurance of productivity through a happy and motivated workforce became an ideology vigorously pursued. Most definitions found during the review did not represent the full picture of the HRM function. For example, Armstrong (2003) defined it as a strategic and coherent approach to the management of an organization's most valued assets: the people working there who individually and collectively contribute to the achievement of its objectives.

In Nigeria, the civil service native staff union was formed in 1912. The amalgamation of the Northern and Southern protectorates by Lord Lugard in 1914 marked the centralization of public service machinery and increased activity of the labour union. The Nigeria Labour Congress and the Trade Union Congress are the latest sensations in the labour movement in Nigeria. No doubt, the advent of labour unionism in Nigeria and the world over has brought a new impetus to human resource management and the human relations angle to organizing. Challenges still exist in human resource management in Nigeria. Corroborating the above statement, Udeze (2000) says "Management has made significant progress in planning, organizing, and measuring work, and success has been achieved in managing material resources for optimal results as well, but the degree of success in managing people could, however, not be said to have recorded the same degree of success." He concludes that human resource management is the most daunting of all management's responsibilities and perhaps the most popular subject of research and experiment. Recently, the need for and importance of human resource management has become more pronounced. It must also be noted that human resources have an unlimited capacity for creativity, resourcefulness, and productivity. Sims (2006) contends that today's managers believe that any attempt to access and activate the potential of human resources holds an

exciting promise for the organization and humanity in areas of higher productivity and profit maximization. This is at variance with the earlier mechanistic approach to managing human resources at work.

Factors Influencing HRM Practices in the Construction Industry

When it comes to human resource management, there are several factors that influence day-to-day operations. As a result, HRM practices differ from one organization to another, as well as from one country to another. Ozutku and Ozturkler (2009) suggest that external and internal factors affecting HR practices differ significantly across countries. There are various factors, internal and external, that have an influence on HRM practices. Some of the major factors which impact HRM practices are;

External factors: According to Kane and Palmer (1995), external factors affecting HRM practices are those pressures on organizations that cannot be controlled and changed as per the organization's needs for adapting in the HRM field. It is important to have a close look at external factors as these impacts the HRM practices of the organization. To avoid being burned by HR, they have to be sure that they are paying close attention to external influences. A well-developed strategy for human resources should take into consideration external factors because there is a good chance that these external factors affect the organization's work. These external factors include the following: economic conditions and changes, technological change and advancements, labour laws and government regulations, diversity and discrimination (workforce demographics), and industry characteristics.

Internal Factors: Internal factors that affect HRM practices are related to the events and changes taking place within the organization. This can include changes in ownership, changes in the internal management structure, mergers, acquisitions, and significant downsizing or hiring trends. The internal environment of organizations strongly affects their HRM practices. According to Zheng and Morrison (2009) study, various HRM practices at small and medium enterprises are influenced by organizational contextual variables including ownership, age, and size of firms. Milkovich and Boudreau (1991) pointed out that researchers have compiled a list of organizational characteristics which are related to HR practices. The important internal factors are as follows: organization size, lack of formal written HRM plan, organizational culture/structure of HRM unit, lack of HRM department, project management factors, retention and job security, quality of work life (QWL), technology, general education on safety and professional skills, managerial factors, unfair wages, lack of motivation, training and retraining (opportunity to learn new skills) and language barrier and communication.

HRM Practices of indigenous and Multinational Construction Firms

The oil boom of the 1970s put Nigeria on the path of strong economic growth, which subsequently put pressure on the government in the area of planning and execution of infrastructural development projects due to a lack of competent Indigenous Construction Firms (ICF) and professionals. There was a climate of co-operation that welcomed foreign management skills and technology (Udeze 2004). This led to the engagement of multinational construction firms (MCF) and professionals in collaboration with the ICF to plan and execute the various development projects. The expectation of the Nigerian government then was that the ICFs would imbibe the management skills, organizational practices and technology of the MCFs and grow and

acquire the requisite competence to be able to handle future construction works of any magnitude, in addition to being competitive. The situation then was just like in British Columbia (2007), which reported strong and sustained economic growth but lacked the required workforce and made efforts to attract skilled workers through immigration. Companies from different countries, cultural settings, ethnic descents, and environments, namely the UK, Germany, Italy, Israel, and Korea, among others, were engaged. Many infrastructure development projects were built by these MCFs, and they continue to operate in Nigeria as construction contractors, employing Nigerian professionals and local firms as subcontractors (Sims, 2005). Collaboration between the MCFs and the ICFs and professionals continued. With the passage of time, many of the indigenous construction professionals formed their own construction companies and started competing with the MCFs.

Imaga (2001) believes that HRM function has been elevated today because of the increasingly critical nature of problems and challenges in the more effective utilization of human resources. When an organization buys or invests in an expensive piece of equipment, it receives a manual containing instructions for operating it, maintaining it, and troubleshooting when the equipment does not function as it should, but when the organization procures its human capital, it does not receive a similar manual. This information gap on human resource management must be filled. The role of the human resource manager is evolving with the change in the competitive market environment and the realization that HRM must play a more strategic role in the success of an organization (Sims, 2005). Organizations that do not prioritize effective management and talent retraining may face dire consequences as their competitors outperform them in the strategic use of their human resources. With the increase in competition, locally or globally, organizations must become more adaptable, resilient, agile, and customer-focused to succeed. To improve the Nigerian construction industry, therefore, there is a need to develop appropriate institutions and good HRM practices to facilitate the development of the industry and to promote multiculturalism by encouraging strategic alliances such as joint ventures between indigenous and multinational construction firms. Through joint partnership with foreign firms, it is expected that managerial and technological know-how and expertise would be transferred to the indigenous construction firms (Ofori, 1991) through policy formulation. A holistic approach, which is fundamentally important to policy articulation, formulation, and implementation, should be adopted. Above all, efforts should be geared towards the development of the economy as a whole, as the development of the construction industry rests on the development of the economy.

Methodology

This study adopted a survey research design. The study was conducted in Akwa Ibom State. The population of the study referred to specific elements of interest in a study. The elements of interest in this study are targeted professionals. The sampling frame for this study consists of large and medium MCFs and ICFs executing public projects within the study area. Therefore, the sample size for this study is sixty-two (62) construction firms. This study adopted both primary and secondary data collection tools. Data obtained from respondents was analyzed using Percentages, mean item score to analyses respondents' ranked opinions based on the 5-point Likert scale. All hypotheses were tested at 0.05 level of significance.

Results

Research Question One: What are the factors that influence HRM practices in Akwa Ibom State?

From the literature, factors inhibiting human resource management practices were identified and their relative effects with respect to construction firms in the study area were collected on a five-point Likert Scale. A mean score was used to evaluate the relative effects of these factors on human resource management practices. The result of the effects of the identified factors on human resource management practices is shown in Table 1. The result shows that fifteen factors having mean scores (MS) greater than or equal to the average mean score of 2.89 significantly affect the human management practices of construction firms in the study area. Of these significant factors, retention and job security, medical care, labour laws and minimum wages, transportation, and human resource management departments that are not an integral part of the firm's strategic planning process ranked as the first significant factors affecting the human resource management practices of construction firms in the study area. On the other hand, unfair wages, diversity and discrimination, and language barriers and communication ranked as the last three factors affecting human resource management practices. The ranks of other factors affecting human resource management practices are shown in Table 1.

Table 1: Relative effects of factors affecting human resource management practices of construction firms

S/N	Factors affecting human resource management practices	N	Sum	Mean	Rank
1.	Retention and job security	60	230	3.83**	1
2.	Medical care (particular hospital to attend in case of injury, sickness or subsidising medical bills)	60	218	3.63	2
3.	Labour laws and minimum wages	60	215	3.58	3
4.	Transportation (vehicle at your disposal, allowance for transportation from location to site and back)	60	202	3.37	4
5.	Human resource department not an integral part of the firm's strategic planning process	60	201	3.35	5
6.	Lack of formal written human resource plan based on the strategic needs of the firm	60	197	3.28	6
7.	Technology	60	197	3.28	6
8.	Regular assessment/evaluation of workers performance on the job at least once a year	60	195	3.25	8
9.	Lack of human resource department and explicit mission statement and goals	60	190	3.17	9
10.	Opportunity to learn new skills in a team environment	60	187	3.12	10
11.	Work based on contract (finish and go)	60	186	3.10	11

12.	Temporary nature of projects	60	184	3.07	12
13.	Opportunity for workers to air their views, thoughts without fear	60	180	3.00	13
14.	Ability of team leaders to adopt close supervision and monitoring strategy to ensure optimum productivity of workers	60	178	2.97	14
15.	Managerial factor	60	174	2.90	15
16.	Ability of team leaders to manage, track and appraise workers performance to enhance their productivity	60	173	2.88	16
17.	Inadequate site staff (less workers for a task leading to excessive work load)	60	168	2.80	17
18.	Quality of work life	60	167	2.78	18
19.	Inadequate training of workers to boost their performance and productivity on the job	60	161	2.68	19
20.	Overtime pay	60	160	2.67	20
21.	Lack of structured incentives	60	156	2.60	21
22.	Safety plans (availability of first aid, provision of safety kits etc.)	60	155	2.58	22
23.	Provision of equipment (adequate equipment to work with, quick replacement and repairs of broken down and old equipment)	60	155	2.58	22
24.	Communication (easy flow of information, being well communicated)	60	154	2.57	24
25.	Equity (fair treatment)	60	153	2.55	25
26.	Lack of motivation	60	144	2.40	26
27.	Team leaders assigning task to workers base on sentiments and favour	60	142	2.37	27
28.	Unfair wages	60	141	2.35	28
29.	Diversity and discrimination	60	123	2.05	29
30.	Language barriers and communication	60	115	1.92*	30
	Average Mean Score			**2.89**	

**** The highest mean level**
***** The least mean level**

The above table 1 presents the relative effects of factors affecting human resource management practices of construction firms. From the result of the data analysis, it was observed that retention and job security, medical care (particular hospital to attend in case of injury, sickness or subsidizing medical bills), Labour laws and minimum wages, transportation (vehicle at your disposal, allowance for transportation from location to site and back), and human resource department not being an integral part

of the firm's strategic planning process, etc., were factors affecting human resource management practices.

Research Question Two: Do HRM practices differ between multinational and indigenous construction firms in Akwa Ibom State?

The influence of the level of use of human resource management practices on the productivity of workers was investigated using Spearman's Rank Correlation Order (see table 2).

Table 2: Mann-Whitney U test of difference between indigenous and multinational construction firms in the level of use of human resource management practices

Null Hypothesis	Test	N	r value	Sig.	Decision
There is no significant correlation between the level of use of human resource management practices of indigenous construction firms and workers' productivity	Spearmans Rank Correlation Order	38	- 0.756	0.000	Reject the null hypothesis
There is no significant correlation between the level of use of human resource management practices of multinational construction firms and workers' productivity	Spearmans Rank Correlation Order	38	- 0.544	0.000	Reject the null hypothesis

*** Asymptotic significances are displayed. The significance level is 0.05**

Table 2 shows the result of this analysis. The result shows that the respondents of the study perceived that there is a significant inverse relationship between the human resource management practices of both indigenous and multinational construction firms and workers' productivity, as indicated by r values of 0.756 and 0.544 and p values of 0.000, respectively.

Hypothesis One

There is no significant difference between HRM practices of Indigenous and multinational construction firms.

Comparison of the Level of Use of Human Resource Management Practices of Indigenous and Multinational Construction Firms in the Study Area

The level of use of human resource management practices of indigenous and multinational construction firms was compared for difference using the Mann-Whitney U test of difference. Table 3 shows the result of the analysis.

Table 3: Mann-Whitney U test of difference between indigenous and multinational construction firms in the level of use of human resource management practices

Null Hypothesis	Test	Sig.	Decision
There is no significant difference in the level of use of human resource management practices between Indigenous and Multinational construction firms	Mann-Whitney U Test	0.000	Reject the null hypothesis

*** Asymptotic significances are displayed. The significance level is 0.05**

The result indicates that asymptotic significance, or p value of 0.000 is less than the significant level of 0.05 set for the study. Therefore, the null hypothesis is rejected and it is concluded that there is a significant difference in the level of use of human resource management practices between indigenous and multinational construction firms.

Discussion of the Findings

The result of the data analysis in table 1 presents the relative effects of factors affecting the human resource management practices of construction firms. The results proved that retention and job security, medical care (particular hospital to attend in case of injury, sickness or subsidizing medical bills), Labour laws and minimum wages, transportation (vehicle at your disposal, allowance for transportation from location to site and back), and the human resource department not being an integral part of the firm's strategic planning process, etc., were factors affecting human resource management practices. This was in agreement with the findings of Noe & Richardson (2010), who studied factors influencing HRM practices in Thailand and identified them as culture, education-human capital, economic systems, and political-legal system.

The result of the data in table 2 presents the Mann-Whitney U test of the difference between indigenous and multinational construction firms in the level of use of human resource management practices. The result shows that the respondents of the study perceived that there is a significant inverse relationship between the human resource management practices of both indigenous and multinational construction firms and workers' productivity by indicating r values of 0.756 and 0.544 and p values of 0.000, respectively. The result was therefore in agreement with Crowe, Vecchi, Brennan, & Coughlan, (2007), who stated that multinational firms perform better in almost all areas than their Indigenous counterparts.

The result of the data in table 3 presents the Mann-Whitney U test of the difference between indigenous and multinational construction firms in the level of use of human resource management practices. The result showed asymptotic significance, or p value of 0.000 less than the significance level of 0.05 set for the study, which made the null hypothesis rejected and it was concluded that there was a significant difference in the level of use of human resource management practices between indigenous and multinational construction firms. The result was in agreement with the findings of Adebayo (2000) who opined that the industry situation in other African countries like Kenya and South African and that though the Indigenous Construction Firms seemed to be as adaptable as their Multinational counterparts, they however showed inadequate involvement of their workers. The degree to which they empower and develop the

capability of their workers, according to him, is less than that of their foreign counterparts and that the Indigenous Construction Firms are therefore at the much lower value-added end of construction activities in Nigeria than the Multinational Construction Firms which are at the high value-added end of the industry due to their competitive advantage. The result of the analysis caused the null hypotheses to be rejected while the alternative one was retained.

Conclusion

The study concluded that human resource management is a very complicated subject in which standardized practices cannot be implemented and followed. This is so because human beings possess varying degrees of psychological behaviors, skills, expertise, emotions, motivation levels, loyalty, and a desire for professional growth. There is a strong relationship between good HRM practices and workers' productivity in construction firms in Akwa Ibom State. This shows that workers will be committed to construction firms where HRM practices are effective. The result indicated that in a firm where HRM is characterized by inconsistencies and deployment challenges, workers' productivity will be low. It is also concluded that there is a significant difference in HRM practices between indigenous construction firms (ICFs) and those of multinational construction companies (MCFs) in the study area. Finally, there is a significant difference in worker productivity between indigenous and multinational construction firms.

Recommendations

1. The construction organizations in Akwa Ibom State should embark on a serious employee training campaign in order to get more from their workers.
2. The indigenous construction companies should improve their human resource management practices, at least to the level of the multinational companies, so that they can get the best from their workers.
3. The construction industries in Akwa Ibom State should internalize good welfare services and effective labor policies.

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Utilization of E-Learning Technological Tools in Teaching and Learning during Emergency Situations

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ABSTRACT

Teaching has been proven to be an attempt to help someone acquire or change skills, attitudes, knowledge, or ideas while learning as a change in human disposition or capability that can be retained but which is not simply ascribed to the process of growing. The paper defined what learning is, noting that it is a relatively permanent or enduring change in behaviour as a result of practise or experience. Changes in perception, insight, reaction, or reasoning may occur, but not as a result of biological changes. For learning to be said to have taken place, the individual learner must demonstrate a positive change in behaviour as a result of learning and experience. It also gave an explanation of what teaching is, teaching and learning in the physical classroom and emergency situations. It was on this basis that the paper concluded that e-learning technological tools are the total of electronic devices and various online tools to support teaching and learning during emergency situations or for remote learning experiences. Teaching and learning are the bones of education. In the recent past, teaching and learning have been done in physical classrooms where a positive classroom climate enhances the emotional and mental well-being of the learner. In physical class, the teacher interacts with the learners on the learning wheel. She uses eye contact to observe the paralinguistic gestures of the learners while teaching, and she changes teaching styles to accommodate all learners. One of the recommendations was that the government should fund education and one of the ways of doing this is to provide adequate e-learning platforms to increase access to the internet and an interactive learning approach. The whole nation should be on the same page on internet use.

KEYWORDS: E-Learning Technological Tools, Teaching and Learning

Introduction

It is better to start discussing this topic by first explaining the important keywords. Countless articles have been written on the concepts of teaching and learning. Once the words "teaching and learning" are mentioned, the first mental picture one gets is of the teachers and students. Teaching and learning is one of the global needs of the nations for cognitive, industrial, wealth, and human development. In this paper, discourse will be made on e-learning, teacher and learning elements in the

physical classroom, the tools used in teaching and learning during emergencies, and the challenges encountered when using them.

The world habours uncertainties, which tend to disrupt the flow of teaching and learning. The global outbreak of Covid-19, which originated in December 2019, led to global shut down of schools and other sectors. For many decades, there have been records of adverse effects of disasters since the dawn of human existence. Not up to 30 years before the outbreak of Covid-19 pandemic, there were various epidemics and pandemics all over the world, and some of the events that struck resulted in a sizable reduction of the world population. In 1999, there were floods, famine, and tsunamis in different parts of the world that claimed many lives. Also in 2014, there was a recorded outbreak of polio and Ebola in some countries in West Africa.

According to Yoshikawa et al. (2020), in 2015–2016 the Zika virus epidemic struck and millions of people died as a result of the epidemic, and between 2018–2020 there was the spread of Kivu, Ebola, and Covid-19, which shocked the whole world. A pandemic is any disease or condition that affects people in many countries at the same time. Covid-19 was "serious," "sudden," "unusual" and was unexpected. Because of the international spread, WHO, in collaboration with IHR International Health Relations, had to declare a lockdown to enhance the reduction of harm to life. The outbreak of the pandemic led to the observance of physical and social distancing. As a result, physical teaching and learning were brought to a halt. Then, one of the global challenges confronting progressive thinkers and educators was how to keep students connected to their learning materials.

What is Teaching?

The concept has attracted different definitions from various disciplines. Clark and Starr (1967) defined teaching as an attempt to help someone acquire or change skills, attitudes, knowledge, or ideas. Teaching is a planned process which requires the methodological application of techniques based on the results of experimental analysis of behaviour. Van Dalen and Brittel in Obiefuna, et al. (2010) saw teaching as the guidance of pupils through planned activities such that the learner may acquire the richest learning possibilities from their experiences. Umunna (2019) defined teaching as the activities undertaken by a more knowledgeable or more experienced person in order to enable a learner to learn. Obiefuna et al. (2010) also defined teaching as the interaction of a young, old, bright or below average intelligence, poor or rich, male or female, or disabled student with a teacher over a subject. According to Mkpa (2005), psychologists define teaching as an interaction between a guide and the learner over a topic or contents in a learning wheel. Teaching includes using one or more strategies to assist the learner in learning a given content.

For this paper, teaching is all the activities of teachers, online or offline, to make students learn. The definitions so far show that teaching is the ability to plan activities that can bring about the transferring of knowledge, skills, habits, and activities in a learner with maximum guidance for a positive change in behaviour, skills, and attitudes. To achieve this aim, teaching must be adequately planned, adequately delivered and properly assessed to meet the needs of the learners. Teaching is not only about presenting the subject matter to the students. The interests, needs, and aspirations of the learner, as well as the environment, should be considered.

What is Learning?

Learning has been defined by different authors from different points of view. Elizabeth Hurlock defines learning as development that comes from exercise and effort. Psychologists in general define learning as a relatively permanent modification of behaviour resulting from experience. Gagne in Iroegbu et al. (2003) defined learning as a change in human disposition or capability that can be retained but which is not simply ascribed to the process of growth. Ebenebe & Unachukwu (1995) defined learning as a process of gaining new insights or changing old ones.

Behaviourist theorists Ebenebe and Unachukwu (1995) define learning as a relatively permanent change in an individual's potential behaviour as a result of experience. To sum up all these definitions, one conclusive definition is upheld, and it is: Learning is a relatively permanent or enduring change in behaviour as a result of practise or experience. Changes in perception, insight, reaction, or reasoning may occur, but not as a result of biological changes. For learning to be said to have taken place, the individual learner must demonstrate a positive change in behaviour as a result of learning and experience. There must be observable behaviour in the life of the learner after the learning experience. The learner must move from the level of not knowing how to do a particular thing to knowing how to do what he was not able to do before the learning experience took place. If there is no change in behaviour, it means that learning did not take place. Efficient learning, whether done in physical classrooms or online classrooms, must change the individual in some ways. It must move the individual from the level of not knowing how to do a particular thing to the level of knowing and doing what he was not able to do before the learning experience took place. Again, the change in an individual must come as a result of experience, and there must be a change in potential performance. It is not enough to discuss learning without mentioning the three important elements of learning. What the learner learns, how he learns the subject matter, the learner's environment, and the learner's interests and aspirations are important and indispensable factors in the learning cycle.

Furthermore, learning should not be viewed as a process of information transfer but as a social and cognitive process. Incidentally, learning does not occur in isolation since learning is a continuous process. Learning takes place anywhere and can take various forms. Learning is not a simple mental process; it involves a lot of intricacies and complex behavior. Learning is a man's interaction with his environment on a daily basis whereby skills and knowledge are acquired. Teaching and learning are like fraternal twins; both are intermingly related. It might be a little difficult to discuss one and leave the other. The difference is that the teacher is in the teaching while the learner is in the learning.

Teaching/Learning in the Physical Classroom

A good physical environment promotes teaching and learning. The sitting arrangement is one of the best panaceas to achieve effective classroom control. The physical classroom environment gives the students an opportunity to come into contact with their mates; it creates a caring, child-centred environment. The teacher has eye-to-eye contact with the students while teaching. A well-organized class motivates children, improves learning, and reduces behavioural issues. The teacher of the class, Umunna (2019), If the classroom atmosphere is positive, students will learn and learn happily, but if the classroom is not well arranged and not warm, the teacher may lose full

control of the class. Some pupils sitting at the back of the class may be doing different things altogether while the lesson is going on.

Learning in the physical classroom enhances effective class interactions with students. Each child has his or her unique potential, which each child has to benefit from. Students build an interest in one another; they share learning materials, edibles, laugh, quarrel, and settle their differences among themselves as part of growing up. Through staying together in a class, they develop a likeness and care for one another. This develops their emotional intelligence, which is one of the important spices and fragrances needed in today's society. Students enjoy teaching and learning more when they stay with their peers and learn in a joking manner, talking and laughing together as they open their minds to one another (Umunna, 2019).

Teaching and learning in a physical classroom offers the teacher the opportunity to use different teaching methods to cover the differences in the learning styles of students. This kind of opportunity may be deficient in some online teaching and learning because, in the physical classroom environment, the teacher while teaching listens to the body movements of the learners. Through the close observation of the expressions on their faces and some paralinguistic movements, she quickly adjusts teaching styles. Not only that, she gives more attention to the slow learners and ensures that they benefit from learning experiences, and she figures out what more remedial attention they need.

As a physical classroom is a home away from home, it is a place of full comfort, home and protection for all members, so it becomes the responsibility of every member of the classroom to make each other happy. One way of achieving this is by following the stated rules and regulations of the class. The teacher is not happy when students flaunt the class rules. The teacher may decide to use any form of punishment schedule to ensure that negative behaviours are not repeated by the individual. Through this means, vicarious learning takes place. Students, having seen the consequences of the actions of their fellow students, may be scared to repeat such behaviour.

The student may not be bold enough to tell the teacher if she makes mistakes in the class. However, the students can tell their parents about their experiences with their teacher at home. If it is a school that rates the activities of the teachers through their pupils or students, the students may anonymously vote for or against the teacher. So, with this type of behaviour control network for the teacher and students, a good teacher would be cautious in what she says and does with the students.

Physical classroom learning, as opposed to online learning, fosters peaceful coexistence between teachers and learners' parents, as well as between students and their fellow students' parents. Parents meet together with teachers on open days at the school. During Parent-Teacher Association (PTA) days, parents and teachers meet, and some lasting relationships start from such meetings. The usefulness of a good physical and positive classroom climate cannot be over emphasized, yes, but in an emergency situation such as COVID-19, a switch to online learning becomes necessary. There are many electronic learning tools that can be used in emergency situations.

Emergency Situation

An emergency situation is any situation that poses an immediate threat to a person's health, security, property, or environment. It means any significant disruption to normal operations caused by a riot, strike, flood, fire outbreak, natural disaster, outbreak of

war, abduction of pupils and teachers, or other serious incident. Any situation that amounts to a threat and harm to a human being, emotionally and physically, is considered an emergency situation. Other emergency situations that may necessitate school closures include blizzards, chemical spills, dam failures, earthquakes, droughts, extreme heat, and thunder storms. In this part of the world, there have never been records of such a global disaster as was experienced recently that led to the shutting down of schools, offices, and public places and physical distancing.

The Inter-agency for education in Emergency INEE decries Emergency International Education as a quality learning opportunities for all ages in situation of crisis. Millions of children and young people affected by global pandemic and they face disruption to their schooling. As Children have right to education even during natural disaster, so, the education of the children goes on even in the critical situations. In this case, education in emergencies is a critical one as it is done to protect the lives of children and those that teach them. The children regardless of where learning takes place, whether for short or long term basis, teaching and learning must on in order to track down the minds of the learners on their academic pursuit. So, emergency situation as a condition in which the specific provisions of regulations cannot be met for a temporal period and which necessitates immediate actions because of the potential danger to public health. Lock down becomes necessary and e-learning becomes the indispensable option to physical learning.

There are many e-learning technological tools that can be used during emergency situations. E-Learning: E-Learning is a new project for education is a new project for education based on the adoption of new computerized, multimedia and telematic technologies. The definition of the term is still a work in progress due to the fact that technologies are evolving everyday and it is difficult to improve teaching technologies or adapt traditional method to a new or already existing educational model. Ewelum and Chigbogu (2017) defined e-learning as an innovative approach for delivering electrically, well designed, interactive learning environment to anyone, any place and any time.

The advancement in digital technology has given room for widespread knowledge and sharing experiences of various kinds via electronic media. E-Learning incorporates all educational activities that are carried out by individuals or groups working online or offline and synchronously via network or stand –alone computer and other electronic devices. It also involves a combination of computers, internet and digital media with established classroom forms. Electronic learning involves all forms of electronic media which includes the following but are not limited to: Interactive television, podcasting, computers and video conferencing. E-learning makes the interaction between the students and the teachers possible as the students learn online. It is a learning realized with the use of some technology via internet. It is a continuity learning through electronic media which is good for short or long term purposes. E-learning uses online tools for learning prescribed courses. Every form of learning which has to do with learning with electronic media via internet is considered an e-learning. It is a kind of umbrella embracing all forms of learning outside physical classroom teaching and learning.

What is online learning? Online learning is the use of internet and a learning experience realized with the use of some technology. It is associated with content readily accessible on a computer. The content may be on the computer hard disk. It is using online tools with internet direction for learning. Online learning is a combination of

blended learning and e-learning as it generally uses online tools for learning the course. It is comprehensive term that includes a number of instructional environment and approaches online learning is an instruction delivered on a digital device that is intended to support learning. It is studying from anywhere at any time without coming in contact with people.

Online learning enables many students who can access internet connection to continue learning without interruption during emergency situations. It accords the learner the opportunity to remain in touch with classmates and teaches and lessons. Incidentally, online learning is new experience to many students in the third world country. The outbreak of Covid-19 gave room to online education to all countries to continue learning while at home.

Difference between e-learning and online learning: e-learning is a kind of learning situation whereby the teaching and learning take place online. The students are taught through a medium. In e-learning, no actual classroom as the teachers and students communicate online. The students must be connected with their teacher through an internet connection to learn. If not connected through internet teaching and learning may not be possible. It is a learner and teacher online for a purpose.

On the other hand, online learning is learning online with the use of internet and it is described as the learning experience that is realized with the use of some technology. It encompasses all other forms of learning as the main idea is using online tools for learning. E-learning is learning utilizing electronic technologies in order to have access to the educational curriculum outside traditional classroom. It is a kind of home-based learning with the aid of an online portal that students have access to students have to log into their respective accounts to learn and do assignments. E-learning contains materials which are either softcopy materials (e.g., worksheet/lecture notes/power point slides) and index explanation of the lecture/class, it contains quizzes, tests, homework and assignments. The students connect to access all materials posted by the teacher. They can post their questions to the teacher and receive answers too.

Online Live Learning Class

In the online live learning class, learning happens just like normal learning but entirely online. The students learn by the tutorship or well experienced teacher. The students and the teacher see themselves as the lesson is ongoing. Both students and teachers communicate with each other via audio, video or/an interactive whiteboard. Live online learning platforms are built with features to aid educational learning like graph papers for students to us. Live online learning can be conducted on individual or group level. The whole idea is to help the learners learn even when at home.

E- Learning Tools

E-learning tools are collection as of all online learning tools, any program, app or technology that can be accessed via an internet connection and enhance teacher's ability to present information and a student's ability to access that information. However, it may be difficult to provide a single definition of online tools because of the variety of tools. In any case, the e-learning tools that can help the students learn during emergency situations are discussed on this paper.

Technological Tools

Technological tools refer to all forms of technologies that are used to transit, store, create, display, share or exchange information by electronic means. When we talk of technological tools, it is not a new word but a comprehensive concept that embrace e-learning, online learning and all media used for online, offline teaching and learning. TT includes such technologies as radio, television, video, DVD, telephone, softwares, hardwares, equipment and services associated with technologies such as video conferencing, email and blogs. Included are all tools to the satellite that link nations to the machines that students work on in the classroom. Technological tools are used in managing different aspects of e-learning, including productivity, content creation, research, networking and communication.

According to Diecker (2019) technological tools are used to facilitate learning and help the learners to remain in touch with their teacher. Google classroom was launched in 2014. More attention was not paid to it by teachers and students in some developing countries. The outbreak of corona virus which brought physical classes to a sudden halt lead many to learn the use of goggle classroom in teaching the students online. Goggle classroom is only available for individuals with Goggle accounts computers or smart phones are needed to access lessons.

Google Classroom

Google classroom is an aspect of online learning developed by Google for schools that aims to simplify, creating, distributing and grading assignments. As a free web services, the sole aim is to streamline the process of sharing files between teachers and students outside a physical class. In Google class, students join class through private code. Teacher creates, distributes and marks assignments within the Goggle ecosystem. Each class creates a separate folder in the respective users drive. The students submit work to be graded by a teacher. The teacher on the other hand, monitors the progress for each student by reviewing revision history of a document and after being graded teachers can return work along with comments.

A student can join Goggle classroom by:

- Go to www.classroo.goggle.com
- Sign in with your C.V. USD (Student)
- Click the x sign on the top right
- Select “join class” and enter class.
- Available wi-fi or data is needed to access goggle class.

During the Covid-19 lock down, a training program was organized by our institutions to abreast the lecturers on how to use Goggle classroom. Students who joined classes benefited. New topics from their scheme of work was taught and assignments given to the students.

However, Goggle classroom has few limitations. Bad hits are on the developing countries. Bad network disrupts teaching and learning. As data is needed, most parents could not provide money for their children from different levels of education in various institutions to buy the data to connect online for lectures. There was hunger during Covid-19. Business was at stand still, some workers were not paid to join goggle classes. Not only that, goggle classroom requires more time as it requires good time

management skills. It creates sense of isolation as neither the teacher nor the students see each other. There is no flow of emotion during teaching and learning. As the teacher do not see the students, the learners may be combining other activities while learning in the goggle classroom.

The mood of the students is not felt white teaching. Finding answers to questions can be difficult as the teacher drops answers to students' questions. As the student's question may not require a "yes or No" answer. She may not get a clear answer she needs from the teacher because they do not see each other. Goggle classroom does not offer the medical students opportunity for practicals in laboratories. If network is poor, accessing information is hampered. In any case, Goggle classroom is an important e-learning tool to get the teachers connected to their students during emergency situations.

Television

Television is a one-way electronic visual communication tool. In many countries, television has been given considerable importance as a source and a tool for teaching. During the Covid-19 period, many countries televised learning contents and also through this medium, educate the populace on how to avoid the spread of the pandemic. Television provides direct class teaching. Selected teacher was made to teach particular topics on their area of specializations. The children tuned in from their various homes and learnt.

Teaching and learning on television broadcasting in no doubt is a very important tool. There is need to consider what happens to students in some third world countries where some villages and towns do not have steady power supply. Some of the television stations have poor network services and cannot be accessed by many families in remote areas. Not only that, what is taught on television most time was not in the scheme of work of all the levels of classes in school. The learners see and hear a teacher teaching on television but sees a huge gulf have the learner cannot ask the teacher questions. Children from low socioeconomic status may not benefit from television lesson because of inability of finance to buy generator and fuel for the children to learn. According to Bruner (1977) individuals learn by listening watching, touching, and reading. And people learn better when the subject matter is relevant to the personal interest of the students.

Radio

Radio is a one-way communication tool which is very important not only for entertainment but for education of the populace and as a viable tool of teaching and learning. The Covid-19 lock down gave a boost in using radio to teach teeming population of children at home. Incidentally, adolescents and teens do not pay greater attention to radio rather they prefer smart phones for various reasons. Children in primary schools and secondary schools were taught certain subjects on fixed days. Although the experience was a short span one. It did not last for a long period of time. As for now, there has not been any verified research work on the outcome of the use of radio in teaching student during the Covid-19 whether it improved their learning or not the only essence was to keep the children back to class. Thus, keeping their minds tracked to their academic pursuit.

On the other hand, it is good to know that some radio stations do not have wider coverage. Students who live close to the network area benefit more than those outside network service areas. Assessment of the learners were not possible as there were no communication between the teachers and the learners. No feedback of any kind. Did the learner pick anything from the lesson taught? The teacher cannot say. However, radio is a better alternative where online learning was not possible and a viable teaching and learning tool in emergency situations.

Class Dojo

Class Dojo is another important online educational tool. This connects the teacher and the students with the parents at home. The parents by request link up their child's teacher to continue teaching the child while at home due to some emergency cases. The teacher monitors the child's learning at home. She can share photos, video to the learner to help him learn better. The skills and values are built up and the family and school become a community in teaching and learning. With class Dojo, the teachers record videos of reading from the pupils recommended text books and send to families for children to watch from home; create digital meet ups and assign tasks to the pupils which they do at home. She makes the students keep a diary of their work at home. On class Dojo, the teacher shares class code and students log in. She share activities and follow up the students online.

Lark

Lark is a software very useful for online teaching. Video conference calls were easy to use and it can contain a lot of people about one hundred in one call. With this, the teacher can teach the students online, being mindful of time and data usage. Lark adjusts the time zones automatically which makes it easier to reach people in any part of the globe. Lark automatically combines group chats, calendar assistant and private messages, with that, saving the teacher from having bunch of different tabs. Lark allows exchange of videos between teachers and students. It is just one App that contains everything needed to collaborate as a group. Incidentally, many have not put lark into use. May be due to data consumption level or they are not aware about the tool.

Zoom

Zoom is a virtual classroom that can contain more than 20 persons in video conferencing. It brings the teacher and students together for teaching and learning. It can be inform of audio or video. It allows screen sharing, so, each participant see things together. Teachings during zoom meetings can be recorded and play off line. The number of people needed in each meeting and the duration is given to the teacher so as to direct learning appropriately. As an online teaching, in most cases, network turbulent disrupts the teaching and learning. The students data get exhausted before meeting ends. Challenges in implementation of e-learning technological tools.

Teaching and learning through e-learning technological tools are useful during emergency situation to keep students back to online classes but there are setbacks experienced in various countries during Covid-19 saga. Each country has it's characteristic and the Covid-19 has diversified effects in nations of the world. Many students lacked the necessary electronic devices needed to access the uploaded materials. The bad hits are students from developing countries. Some students that

could afford smart phoned could not login for on learning teaching due to lack of money to buy data. Again, there was lack of structured contents plus the abundance of online resources and learners were confused on what to read or not. Note only that, there is lack of human interaction between teachers and students as well as students, students interactions which amounts for the emotional wellbeing of the learner is lacking in the use of some online learning tools. As the lock-down was a sudden one, teachers were not prepared to teach online but it became necessary to do that, so, many lack the digital skills needed for effective online teaching. Some students lack the skills too.

Online teaching and learning has some conditions which users are required to meet up so, inability to comply, denys the person an opportunity to access online classes. Insufficient bandwidth, delay or connection failures during lessons and video conferencing and insufficient broadband connections are challenges of learning online. There is also the challenge of the know-how and expertise in monitoring and evaluating of learning. In all, there is no teaching tool that is void of merit or demerit but modalities should be put in place, to fill up the missing gaps.

Conclusion

E-learning technological tools are the total of electronic devices and various online tools to support teaching and learning during emergency situations or for remote learning experiences. Teaching and learning are bones of education. In the recent past, teaching and learning had been done in physical classrooms where positive classroom climate enhances emotional and mental well-being of the learner. In physical class, the teacher interacts with the learners in the learning wheel. She uses eye contacts to observe paralinguistic gestures of the learners while teaching and she changes teaching styles to accommodate all learners. Covid-19 brought a sudden switch to online learning which is a panacea for continuing education in emergency situation. Students were taught while at home but statistical evidence are yet to show if those tools positively helped to influence the academic achievement of students in developing counties such as Nigeria.

Recommendations

The following recommendations were made:

1. Government should fund education and one of the ways of doing this is to provide adequate e-learning platforms to increase access to the internet and interactive learning approach. The whole nation should be on the same page on internet use.

2. Government should organize workshops and trainings for teachers and students to improve their technological and pedagogical competencies in online learning.

3. E-learning technological tools providers should improve in their packages set for teaching and learning and make them in such a way that teaching and learning online cost little or nothing for the teachers and students.

4. Teachers should use some of the learning technological tools in their physical teaching.

5. Student should have interest in their studies whether online learning or in physical classroom.

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ABSTRACT

The internal temporal constituency of events is reflected in the verb element within the discourse structure of every natural language. This paper described aspectual distinctions in Gokana within a formal linguistic framework. The study identified sixteen discrete aspects in Gokana and found that these distinctions can be categorized into four basic aspects: completive, durative, inceptive and habitual which reflect the syntactic and semantic properties of aspects as a grammatical category in the language. The study reported an interaction between tense and aspect, and showed that four tenses viz simple, past, unfulfilled and future co-occur with each distinct aspect marked in Gokana. The paper reported that Gokana marks aspectual distinctions through three different strategies grammaticalization, lexicalization and a combination of both processes. The paper showed that the grammaticalized markers always precede the verb within clause structure (except the completive aspect marker) and are treated as distinct grammatical morphemes and not affixes or clitics. The study recommended a separate morpho-syntactic analysis of all aspectual markers in the language.

KEYWORDS: Gokana, Aspects, Aspectual Markers, Tense, Grammaticalization, Lexicalization, Syntax

Introduction

This paper investigated aspectual distinctions in Gokana within a formal linguistic framework. Gokana is spoken in Gokana Local Government Area of Rivers State, Nigeria by approximately 200,000 people. It is closely related to Baan, Eleme, Tee and Kana. These languages form a genetic unity and Williamson and Blench (2000:33) classify them in Delta-Cross of Cross River within the Bantoid-Cross of the East Benue-Congo branch of Benue-Congo.

Defining Aspects

According to Comrie (1976:3) "aspects are different ways of viewing the internal temporal constituency of a situation". Whereas tense is a deictic category, aspect is not (Lyons 1995:320). Tense grammaticalizes real world time contrast, but aspect grammaticalizes the internal temporal constituency of situations. Aspect focuses attention on the manner in which verbal actions are regarded or experienced by the speaker (i.e. whether completed, continuing through time, intermittent occurrence, beginning etc.).

A number of studies (e.g. Quirk and Greenbaum (1977), Radford (1988), Jenkins (2003), Ndimele (1996), Crystal (1997), Huddleston (1988), Dik (1978), and Isaac (2003)) agree that aspectual distinctions play a crucial role in the discourse structure of

natural languages. Thus, the present study attempts a description of the grammar of aspects in Gokana.

Methodology

The researcher collected data from fluent native speakers of Gokana with the help of field assistants. The researcher also relied on his intuition as a native speaker of the language but where any given set of data contradicted his intuition, direct oral interview was used to elicit comparative data from other native speakers of the language. Secondary sources of data such as texts and library materials were also utilized.

Analyzing Aspects in Gokana

In the grammatical structure of Gokana, the following aspectual distinctions are attested:

i.) Completive Aspect
ii.) Durative Aspect
iii.) Inceptive Aspect
iv.) Habitual Aspect

These distinctions reflect the syntactic and semantic properties of aspects in Gokana (cf. Lyons 1995:323). In what follows, each of these distinctions is analyzed.

A. Completive Aspect

This aspect defines itself in that it highlights completed situations only. Depending on deictic reference, three distinct completive aspects are distinguished in the language. These are:

i.) The Simple Completive Aspect
ii.) The Past Completive Aspect
iii.) The Future Completive Aspect

i.) The Simple Completive Aspect

In Gokana, the simple completive aspect refers to completed situations. The simple completive marker is **lọl**. It is a verbal item which has grammaticalized. It occurs after the verb whose aspect is to be marked.

Examples:

1a) Ledum dé lọl
PN eat CAM
'Ledum finished eating'

b) bà fó lọl
they plant CAM
'They finished planting'

When the verb co-occurs with a complement, the completive aspect marker occurs after the complement, as in (2a-b):

2a) Ledum dé gyáá lọl
PN eat food CAM
'Ledum finished eating'

b) bà fó sáakéè lọl
they plant pepper CAM
'They finished planting pepper'

ii.) The Past Completive Aspect

The past completive aspect refers to a completed past in the past. In Gokana, this aspect is often used when the interest of the speaker is to know which of two or a series of events happened first.

The past completive marker has a discontinuous structure. It is made up of two parts **beè...lọl**. The first part is simple past marker, while the second part is the completive aspect marker. Both parts form a structural unit. The verb to be marked for the past completive aspect occurs between the two parts of the marker.

Examples:

3a) bà beè dé lọl
They PST eat CAM
'They had finished eating'

b) Bàri beè sí a tóm lọl
God PST do his work CAM
'God has finished his work'

iii.) The Future Completive Aspect

The future completive aspect indicates situations that will extend to and be completed within a period of time in the future. The emphasis of this aspect is basically on completion of a given situation in the future. The future completive marker has a discontinuous structure. It is made up of two parts **gébeè...lọl**. The first part is the simple future marker, while the second part is the lexical item which modifies the first part. The consistent occurrence of this lexical morpheme meaning 'completed/finished' with the future marker as a structural unit, which indicates the future completive aspect, shows that this lexical item has been grammaticalized in the language. The verb to be marked for the future completive aspect always occurs between the two parts of the marker. The future completive marker **gébeè...lọl** has four variants. The first part corresponds to the four variants of the future marker.

i.) gébeè...lọl : CVCVV...CVC
ii.) ébeè...lọl : VCVV...CVC
iii.) mbeè...lọl : VCVV...CVC
iv.) è...lọl : V...CVC

These variants have the following characteristics.

i.) They occur in free variation
ii.) They can occur with all subjects.

iii.) They can occur with nouns as the subject of their constructions
iv.) There is no constraint on their occurrence in larger structures

The constructions in (4a-b) provide examples of the future completive aspect:

4a) Sira gébeè bùl lọl
PN FUT cook CAM
'Sira will have cooked'

b) kpenè vóí lọòre, m gébeè emi lọl
This now tomorrow I FUT write CAM
'By this time tomorrow, I shall have written'

B. Durative Aspect

This indicates a situation that is continuing through time. It is always expected that there will be an end to such situations.

Tense also occurs in the durative aspect. This interaction results in the following durative structures:

i.) Simple Durative Aspect
ii.) Past Durative Aspect
iii.) Unfulfilled Durative Aspect
iv.) Future Durative Aspect

In what follows, each of these is examined.

i.) The Simple Durative Aspect

The simple durative aspect expresses situations that are still continuing. Such activities or states are seen as incomplete and usually occupy a limited period of time, as there is always an exception that there will be an end to the activity or state. The simple durative aspect is grammaticalized in the language. The simple durative marker is gé with a CV structure. gé can also be realized as é in connected speech, where the initial segment gets deleted. gé and é occur in free variation and must always precede the verb.

Examples:

5a) CV
gé as in: bà gé dú kĩĩ
they DR come here
'They are coming here'

b) V
é as in: bà é dú kĩĩ
they DR come here
'They are coming here'

The durative marker **gé/é** may be ambiguous with the short forms of the future marker **gé/é**. Thus, the semantic reading of constructions such as (6) may have a simple future interpretation and a durative interpretation.

6) gbò nvin á gé/é ọl sọl
PI child the FUT/DR sing song
'The children will sing/the children are singing'

In situations of this nature, the only way to resolve the ambiguity is to use the full forms of both the future marker and the durative marker. When the full forms are used, a distinction is established. Thus, gbò nvin á gébeè ọl sọl 'the children will sing' is distinct from gbò nvin á gé ọl sọl 'the children are singing'. But with the short forms, the difference is neutralized.

ii.) The Past Durative Aspect

The past durative aspect is used to show that a situation was continuing at the time another situation occurred. This aspect has the meaning of incompletion.

The past durative aspect is grammaticalized in the language. The grammatical morpheme **géè** is used to mark this aspect and it always preceded the verb.

Observe that the past durative marker is made up of the simple durative morpheme **gé** and the past morpheme è (i.e. **gé+è→ géè**).

Unlike the other markers, the past durative marker **géè** has no variant form.

Examples:

7a) Lédùm géè zib nu tõó m beè sii e
PN DR-PST seal something when I PST catch him
'Ledum was stealing when I caught him'

b) Duùrà géè emí kpá èrà a
PN DR-PST write book evening that
'Duura was writing that evening'

Notice that the constructions in (7a-b) show duration and incompletion, since neither the stealing nor the writing was completed. In (7a) the action of stealing was interrupted by the next action of catching the thief, while there is no indication that the writing in (7b) was completed in the course of the evening.

iii.) The Unfulfilled Durative Aspect

The unfulfilled durative aspect is used to show a situation that ought to have continued through time before the moment of speaking. Such constructions always have an unfulfilled interpretation. The unfulfilled durative aspect is marked by **gẹẹ...gé** which is a combination of the unfulfilled morpheme and the durative morpheme. Examples:

8a) Sira gẹẹ dù
PN UNF come
'Sira ought to have come'

b) Sira gé dù
PN DR come
'Sira is coming'

c) Sira gẹẹ gé dù
PN UNF DR come
'Sira ought to have been coming'

Observe that (8a) and (8b) express an unfulfilled and a durative meaning respectively, but (8c) expresses an unfulfilled durative meaning through the combination of the unfulfilled and durative morphemes.

iv.) The Future Durative Aspect

The future durative aspect is used to indicate that a situation will extend over the whole of a future period of time, but its termination may eventually be expected.

The future durative aspect is grammaticalized. It has a complex structure. It is made up of a discontinuous structure **gébeè dì...gé**. This marker consists of the future marker, the verb 'to be' and the durative marker. Like the future completive marker, this marker consists of two parts, but while the future completive marker houses the verb whose aspect is to be marked between its two part, the future durative marker houses an anaphor between its two parts. This anaphor takes as antecedent the subject of the construction. The marker always precedes the verb.

Examples:

9a) Síra gébeè dì a gé érá
PN FUT be she DR wait
'Sira will be waiting'

b) bà gébeè dì bà gé ọl sól
they FUT be they DR sing song
'They will be singing'

The future durative marker has eight variants. These variants occur as a result of segment deletion in connected speech. The variants have the following structures:

i.)	gébeè	dì... gé	:	CVCVV	+	CV	+	CV
ii.)	ébeè	dì... gé	:	VCVV	+	CV	+	CV
iii.)	mbeè	dì... gé	:	VCVV	+	CV	+	CV
iv.)	é	dì... gé	:	V	+	CV	+	CV
v.)	gébeè	dì... é	:	CVCVV	+	CV	+	V
vi.)	ébeè	dì... é	:	VCVV	+	CV	+	V
vii.)	mbeè	dì... é	:	VCVV	+	CV	+	V
viii.)	é	dì... é	:	V	+	CV	+	V

The future durative marker has the following characteristics:

i.) All the variants occur in free variation.

ii.) The choice of any variant is not dependent on any phonological conditioning factor.

C. The Inceptive Aspect

The inceptive aspect marks the beginning of a situation. It is the initiation point. Tense occurs in the inceptive aspect such that it is possible to distinguish a simple inceptive, past inceptive, unfulfilled inceptive and future inceptive aspect. In what follows, each of these is examined.

i.) The Simple Inceptive Aspect

The simple inceptive aspect marks the starting point of a situation. Although this aspect coincides with the speech moment, it does not attract any deictic marking, as certain time adverbials showing different phases of time in relation to the speech moment may occur in a simple inceptive construction.

Examples:

10a) Vígà daà-togó sí tóm
PN raise head do work
'Viga started working'

b) Vígà daà-togó sí tóm nyèna
PN raise head do work last year
'Viga started working last year'

c) Vígà daà-togó sí tóm lọòre
PN raise head do work tomorrow
'Viga starts to work tomorrow'

The simple inceptive aspect is not grammaticalized in the language but its marking is achieved through lexicalization. It is expressed in the language by a compound lexical item **daà-togó** which glosses as 'start' in English. This lexical item is made up of the verbal element **daà** 'raise' and the noun **togó** 'head'. It must precede the verb.

Examples:

11a) Zigàkól daà-togó dé gyãá
PN raise head eat food
'Zigakol started eating'

b) gbò nvín á daà-togó bìràbil
group child the raise head play play
'The children started playing'

ii.) The Past Inceptive Aspect

This marks the beginning of a situation that occurred before the moment of speaking. The past marker **beè** and the lexical inceptive marker **daà-togó** combine to form the past inceptive marker. **beè daà-togó**. The marker must always precede the verb. Examples:

12a) Gbárà á beè daà-togó õ sĩĩ
Man the PST raise head drink cigarrete
'The man had started smoking'

b) Lédùm beè daà-togó sí tóm
PN PST raise head do work
'Ledum had started working'

iii.) The Unfulfilled Inceptive Aspect

This aspect marks the beginning of a situation that ought to have occurred before the speech moment. The unfulfilled inceptive aspect is marked by a combination of the unfulfilled marker and the lexical inceptive marker. It is realized as **gẹẹ daà-togó**. It occurs before the verb.

Examples:

13a) Bìàlé gẹẹ daà-togó kyãà sõò kpóótọ ẹ zọ ẹ
PN UNF raise head walk but leg her pain her
'Biale ought to have started walking but her legs are aching'

b) nvín á géè daà-togó dé gyãá be múúró beè dì
child the UNF raise head eat food if soup PST be
'The child would have started eating if there was soup'

iv.) The Future Inceptive Aspect

The future inceptive aspect marks the initiation point of situations that may begin after the speech moment (such situations occur in posterior relation to the speech moment).

The future inceptive aspect is marked by a combination of the future marker and the lexical inceptive marker. It is realized as **gébeè daà-togó**. It always precedes the verb.

Examples:

14a) gbò nvín á gébeè daà-togó bìràbil
group child the FUT raise head play play
'The children will start playing'

b) kpóótọ ẹ gébeè daà-togó zọ ẹ
leg his FUT raise head pain him
'His legs will begin to ache'

The various short forms of the future marker can also occur with the inceptive marker.

D. Habitual Aspect

The habitual aspect is akin to the durative in that it refers to situations yet to be completed, but which are recurrent, customary or intermittent in nature. Tense also occurs in the habitual aspect, such that four habitual aspects are distinguished in the language. These are:

i.) Simple Habitual Aspect
ii.) Past Habitual Aspect

iii.) Unfulfilled Habitual Aspect
iv.) Future Habitual Aspect

i.) The Simple Habitual Aspect

The simple habitual aspect refers to situations that are recurrent. It asserts the fact that a given situation is actually recurrent or habitual. The simple habitual aspect is lexicalized in the language. The lexical item **órò** is utilized to mark this aspect. Examples:

15a) Tètẹ órò bà túu
PN HAB eat periwinkle
'Tete eats periwinkle'

b) gbò pábia órò bã pírì
group woman HAB enter gossip
'Women usually gossip'

c) gbò nvín á órò sí tọọkpá
group child the HAB go house book
'The children always go to school'

ii.) The Past Habitual Aspect

This aspect refers to situations that were recurrent before the speech moment. The simple past morpheme and the lexicalized habitual marker co-occur to mark the past habitual aspect. It is realized as **beè órò**. It occurs before the verb.

Examples:

16a) Tètẹ beè órò bà túu
PN PST HAB eat periwinkle
'Tete used to eat periwinkle'

b) gbò pábia beè órò bã pírì
group woman PST HAB enter gossip
'Women used to gossip'

c) gbò nvín á beè órò sí tọọkpá
group child the PST HAB go house book
'The children used to go to school'

iii.) The Unfulfilled Habitual Aspect

This aspect refers to situations that ought to be recurrent, intermittent or habitual before the moment of speaking. It denotes a past unfulfilled situation. The unfulfilled morpheme and the lexicalized habitual marker **órò** combine to mark the unfulfilled habitual aspect. It is realized as **gẹẹ órò**. Examples:

17a) Tètẹ gẹẹ órò bà túu
PN UNF HAB eat periwinkle
'Tete ought to have always eaten periwinkle'

b) gbò pábia gẹẹ órò bã pírì
group woman UNF HAB enter gossip
'The women must have always gossiped'

c) gbò nvín á gẹẹ órò sí tọọkpá
group child the UNF HAB go house book
'The children ought to have always gone to school'

iv.) The Future Habitual Aspect

This aspect shows situations that are recurrent after the speech moment. The future marker **gébeè** and the lexicalized habitual marker **órò** combine to mark the future habitual aspect. It is realized as **gébeè órò**. It always precedes the verb.

Examples:

18a) Tètẹ gébeè órò bà túu
PN FUT HAB eat periwinkle
'Tete will always eat periwinkle'

b) gbò pábia gébeè órò bã pírì
group woman FUT HAB enter gossip
'Women always gossip'

c) gbò nvín á gébeè órò sí tọọkpá
group child the FUT HAB go house book
'The children will always go to school'

E. Interaction Between Tense and Aspect

The interface between tense and aspect in Gokana yields a number of aspectual distinctions which are summarized in Fig 4.1.

Fig 1: Interaction Between Tense and Aspect

TENSE	ASPECT	MARKERS	REMARKS
SIMPLE	Completive	lọl	Grammaticalized
	Durative	gé	Grammaticalized
	Inceptive	daà-togó	Lexicalized
	Habitual	órò	Lexicalized
PAST	Completive	beè... lọl	Discontinuous/Grammaticalized
	Durative	géè	Grammaticalized
	Inceptive	beè daà-togó	Combined
	Habitual	beè órò	Combined
UNFULFILLED	Completive	géè... lọl	Discontinuous/Grammaticalized
	Durative	géè... gé	Grammaticalized
	Inceptive	géè daà-togó	Combined
	Habitual	géè órò	Combined

FUTURE	Completive	gébeè... lọl	Grammaticalized/Discontinuous
	Durative	gébeè ... gé	Grammaticalized/Discontinuous
	Inceptive	gébeè daà-togó	Combined
	Habitual	gébeè órò	Combined

Conclusion

In this paper, we have analyzed aspectual distinctions in Gokana. The paper found that the completive, durative, inceptive and habitual aspects are attested in the grammatical structure of Gokana. These distinctions reflect the syntactic and semantic properties of aspects as a grammatical category in Gokana.

The paper presented the internal analysis of each of the attested distinctions that occur in the language and reported an interface between tense and aspect in the analysis of these distinctions. The study found that four tenses viz simple, past, unfulfilled and future co-occur with each distinct aspect marked in Gokana which culminated in sixteen discrete aspectual distinctions in the language.

The study showed that some of the aspectual forms are marked through a grammaticalized process, a few are lexicalized while others combine a lexical as well as a grammatical process in the marking of aspect. The paper noted that the grammaticalized markers always precede the verb in clause structure and are considered as distinct grammatical morphemes and not affixes or clitics.

Recommendations

1. The paper recommended that further research be done in the analysis of the aspectual markers in order to determine the objective syntactic status of the grammmaticalized markers.
2. The study equally recommended an independent morphosyntactic analysis of the lexicalized aspectual markers in order to determine whether they are in the process of grammaticalization and document all grammatical facts that emanate from the assessment.

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