SCOTTISH JOURNAL OF
ARTS, SOCIAL SCIENCES
AND
SCIENTIFIC STUDIES

Articles

Reimaging Iban Longhouses in Urban Context: A study in Sarawak, Malaysia

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Abstract

Located in the island of Borneo, Sarawak is home to 28 ethnic groups, each with their own distinct language, culture and lifestyle. The Ibans form the major ethnic group on this land with about 29% of the total population. Sarawak is culturally rich in terms of its various races, religions, laguages, and celebrations. However due to the intense injection of modernity as well as huge migration of rural people to the major cities especially in peninsular Malaysia, the Ibans in Sarawak are suffering major cultural loss as younger generations scarcley showing interest to learn and bring up their tradition from their ancestors and the older generations. This paper aimed is to learn more about the Ibans' way of life and tradition as well as the cause of cultural depletion and its issues and therefore the necessity to preserve the heritage. In terms of Architectural solution, the longhouses, which are the traditional houses for Ibans, were found to be especially in need to be reimaged in the modern urban context.

Keywords: Iban, Sarawak, Longhouse, Heritage, Cultural Depletion

1. Introduction

The Ibans is an indigenous tribe of Borneo, which forms the biggest ethnic group in Sarawak, Malaysia. Due to the vast migration of Ibans from rural to city areas, tradition and culture is gradually disappearing. The young and old generations are not being able to preserve their culture. At present day, as modernization is taking place everywhere, there is a need to restore and revive the culture and tradition of Ibans as it represents the identity of Sarawak. The livelihood and cultural heritage are currently at risk due to several causes such as drastic increase of migration among the locals from traditional 'longhouses' to seek a better life in the city. Some of the cultures and tradition are no longer practiced by the younger generations which also raise concerns.

2. The Iban Culture in Sarawak, Malaysia

2.1 Iban People

The Ibans were originally known as wanderers in Borneo were also famous for their bravery and boldness which were reflected by their reputation as fighting men and head hunters who were feared by many which at that time were their dominant characteristics. However the Ibans' exact origin is unknown and unclear due to the absence of written historical records. It is said that the Ibans resemble some of the other tribes which can be found elsewhere in South East Asia for example, Sumatra, or in the Indo-Burmese border.

The Ibans' way of life was geared to a system of exploiting the green and virgin jungle country for semi-permanent cultivation. They would normally settle down at the spot picked and then cut and burn where on the richly covered humus of the newly-cleared forest land, they would farm their hill paddy. Due to the high fertility, crops can be easily grown on the newly-cleared land. Besides hill paddy, the Ibans also rely on fish and games by hunting which can be found plenty in the forests. That time, there were no land title and there were rights for descendants to use the lands of their fore-father who were first to fell the jungle. So as long as there was plenty fresh jungle, it was a relatively rich life and one which could support energetic and virile people. Though there were few serious outbreaks of diseases, the population of the Ibans increased in numbers along the years.

As the population increased, some of them would remain in the valley to cultivate the land after allowing the forest to regenerate given an interval of fifteen years or so. After the felling of the trees and the clearance of the lands, a fairly high fertility could be maintained and as long as demands did not increase unduly, the supply of wild food was also satisfactory.

But some tribes under the leadership of dynamic personalities had the tendency to move over the watershed into the next valley or paddle their canoes out to sea and round the coastline into a new country and resettle down to their established way of life.

If the land of the new country was sparsely occupied, the Ibans might attack and drive away the original inhabitants but very often they obtained permission to enter such land and gradually absorbed the people who had preceded them. It was a way of life which was dependent on a continuous process of expansion into fresh jungle country.

2.2 Iban Lifestyle

When the Ibans are not busy farming and hunting, their great preoccupation was that of waging war. The various Iban groups were generally fighting each other. All other races were their traditional enemies, particularly those with whom they came into contact as they expanded. There was little or nothing of an Iban national consciousness.

Coupled with a warlike spirit was a belief in the magical powers of human heads. Heads were believed to bring strength and virtue and prosperity to the longhouse and it was the object of every young warrior to bring back a head to adorn his house. This was also the crowning proof of manhood. Little parties were continually setting off under the leadership of some young blood to

attack their enemies and bring back their heads. It was not an attractive form of warfare because it was mainly a matter of stalking the unwary and of sudden attacks. It made no difference to the value of the head, if it was of an old lady cut off in a rice field or a child caught bird-nesting. Head obtained in this way were not considered in any way inferior to that of a warrior killed in an equal fight. However, those horrifying practices are extinct these days.

Although the Ibans have plenty to eat and drink, they are relatively careful in their personal habits. They feed well and at special festivals convert great quantities of rice into rice beer called *tuak*. The position of women in the Iban community is a favorable one where they play an important role as part of the community where they are able to enjoy many rights on terms of equality with the men including the right to divorce their husbands. They work very hard but occupy a well-established place in the community.

The Ibans believe in the spiritual world populated by good and evil spirits. They were taken very seriously. The influence of good spirits has to be invoked and bad spirits driven away. Messages from the spiritual world is believed to be conveyed through dreams and by certain birds and by their state of the livers of slaughtered pigs. The Ibans have no lack of spiritual beliefs to guide them in their everyday life.

Life among the Ibans is self-sufficient. The people are clever at making use of the natural products of the virgin jungle cloth that is woven from a form of cotton beaten out of a certain kind of bark. Occasional trading parties were able to obtain special requirements such as salt and iron in exchange for jungle products (Figure 1).

Figure 1: Images of Iban lifestyle; a) an Iban blowpipe hunter (PREA (2014), b) Traditional conical hats weaved by using rattan (Annie 2012), c) The *pua kumbu* known as the Iban traditional woven blanket (Kosmo Online 2014), d) Old Iban men with their tattoos (Kosmo Online 2014).

2.3   Iban Longhouses

The Ibans traditionally live in longhouses which can be identified as villages under one roof and groups of longhouses would generally band together under one leader. The longhouse in the old days was usually fairly large because it was desirable that it should contain a substantial number of

fighting men for the purpose of defense. Twenty of thirty families or even more would live together under one roof. Many would be linked by ties of relationship.

The longhouse is basically made of wood from the felled trees which are raised up by stilts off the ground and entered by climbing up notched logs which, if necessary, could be pulled up at night for security purposes. Longhouses built on stilts are based on several purposes. It is for the protection against sudden attack of enemies and entrances could only be gained by a limited number of doors and it kept the house out of the way of floods as well as wild animals and insects.

Architecturally, the house has three main parts. First, it is the long interior communal room which is called *ruai*. The *ruai* is made up of individual sections in front of the house joined together and is used for several important occasions as well as daily interaction space. The Ibans normally would gather round at the communal verandah perhaps around a visitor to the longhouse and listen to news of the outside world. *Ruai* also serves as a crucial space for important festivals such as *Hari Gawai* which is the harvesting festival which is celebrated every 1st of June every year to thank the gods to allow good harvest for them. The communal corridor is also a place for leisure where people would sit and have light chit-chats. Sometimes children could be seen playing mini-games like the *batu seremban*. Next adjacent to the *ruai*, the exterior corridor or known as the long open verandah is called *tanju* which serves many purposes. The *tanju* is used for drying paddy and clothes and for other household activities. This open verandah is where much life and activities can be seen. Sometimes, men would be working on wood crafts for example bamboo boxes or weaving baskets and also mending fishing nets. *Tanju* also serves as an important platform to welcome outsiders as well as guests during certain occasions. These guests would be served some drinks on the *tanju* before stepping up on the *ruai*. Going deeper into the house, is the *bilek* which is separated by wooden walls from the *ruai*. The *bilek* is the private room for each family. This is the space where each family would gather and eat meals together. *Bilek* also serves as a space to store the family's priced possessions such as jars, brassware, and other heirlooms, the accumulated wealth of past and present generations. The men in the family would sleep in the *bilek* as well as the mothers and elderly women but young women and teenage girls would normally go up to the attic called the *sadau* using a ladder for privacy purposes. The attic is also used to store the family's food such as rice and other dry food (Figure 2).
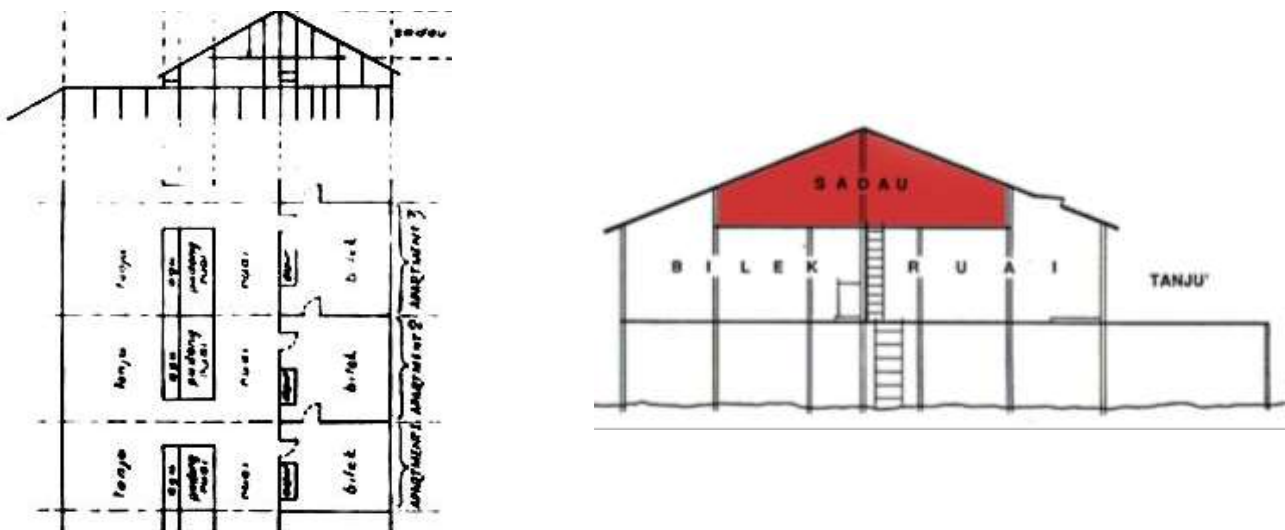

Figure 1: Plan and Section of the traditional Iban longhouse (Anggat 2010) .

Figure 2: Images of *Ruai* and *Tanju:* a) on the left, young children playing *batu seremban* in in the *ruai* (source: Authors), b) image on the right shows a photo session of an Iban family on the *tanju* (Pendiau 2013).

Responsible for safeguarding the families of the longhouse, in the centre of the longhouse, rests the chiefly longhouse headman called the *tuai rumah*. The headman is helped by elderly people called *tuai-tuai* in terms of giving advices into leading the whole house as a large community. Although the Ibans have its own leader, the post is not inherited. Normally the *tuai rumah* is selected by the representatives of all families in the house and if he loses the confidence of leading the whole community or become too old and infirm to do his work, the headman would then retire and is replaced by other leader. The chief might be succeeded by his son if he has one but this will not be an automatic process. The chiefs and headmen were expected to be wealthy as well because they have much entertaining to do. The head of the house is responsible to solve any misunderstandings as well as commotions caused by the members of the longhouse. The chief is also responsible in the matters of the *adat* where Iban traditional rituals take place and the chief must be able to maintain the good relationship of the spirits with the all longhouse members.

3.   Need for reimaging Longhouses in modern urban context

Like many other clans around the world who are struggling to restore their heritage, Ibans face a challenge to what to keep and what to let go. All traditional rituals may not need to be restored, but they might need to be remembered to the least. Cultural elements have tangible and intangible parts. Intangibles are more prone to be lost in time. However, this study focuses only one of the tangible elements, the architectural heritage of Iban culture, particularly the longhouses, that needs to be remembered, possibly restored, and most importantly represented in modern ways so that newer generations find newer solutions to their ancient heritages, and the rest can learn about them. However, first a look at extinct intangible elements would be worthy to mention.

As mentioned earlier, the Ibans form the biggest ethnic group in Sarawak with a population of about 682,400 or 28.9 per cent of the state's population of 2,357,500. Over the years, some Ibans have also migrated to peninsular Malaysia, particularly in Pasir Gudang and Masai in Johor, and also in Sabah, concentrated mostly in Merotai and Tawau. The Ibans were well-known for their rich folklores, especially oral traditions, as well as costumes, dances and music. However, with the swift transformation of the community to modern lifestyles, brought about by the rapid growth of infrastructural development and tertiary education, this cultural heritage was in danger of vanishing. The vanishing of Iban culture is also caused by the mass migration of the people from the rural areas to the city due to better job opportunities as well as a better lifestyle. One example is the musical ensemble called *enkerumung*, performed in accompaniment to Iban traditional dances. The rich traditions and customs of the Iban community should be preserved by the respective longhouses or regions through a collective effort from the elders and younger generations or the precious and unique tradition would be lost admist the young genereation.

\On the other hand, there are tangible element of culture can be physically preserved, restored, conserved or remembered. Iban longhouses are one of the, which many of Iban cultural events use to take places in their longhouses. Therefore, longhouses are itself an element to be preserved.

4.   Methods of Reimaging Longhouses

4.1   Restoration and Preservation of Traditional Elements of Longhouses

The longhouse, which is basically consisted of the four main spaces which are the tanju, ruai, bilik and sadau must be reflected in terms of design elements into the modern longhouses. In this way, the architectural values of the Iban longhouse would be able to be preserved and its spaces could be felt.

Figure 3 shows a traditional *tanju* in Iban Longhouse. The vernacular architecture is embedded with the context of the surrounding landscape. Replication of Longhouse with modern materials in modern urban context is inevitable. The riverway is replaced by the driveway with car parking facilities. The *tanju* is replaced by covered portico.

Figure 3: Images of the traditional *tanju* of an Iban longhouse at left (Pendiau 2013), and a form of longhouse which is rebuilt as the old one was destroyed by fire (Source: Authors).

Figure 4 shows another interpretation of traditional longhouses in modern setup. The *ruai* is built with modern materials with modern technology are used for human comfort. The *bileks* and *sadaus* can also be identified clearly. Intentional marking in the ceiling shows the invisible individual boundaries along the *ruai*. In terms of details, inarguably the basic components are represented. However, the question lies whether the image of the longhouse was restored in the urban setup. The rural longhouses had intimate relationships with waterways and deep forest. One can argue that in modern setup, that context is no longer significant. However, there still can be a space for Romanticism to take place, and the image of a longhouse in modern context can be much more appealing than the ones we see in these figures.

Figure 4: The two images show traces of vanishing image when modernization takes place

4.2. Prospect of Tourism

Iban traditional longhouses are a key tourism attraction in Sarawak. The tourist marketing of Iban longhouses tours mostly are anticipated by tourists where the Iban traditional culture are presented as a colourful and exotic image. Tattooed Iban men wearing loincloths paddling a longboat along a clear river, aiming blowpipes up into trees, or holding a roster in a *miring* ceremony is of immense tourist attraction. Iban men and women posed in full ceremonial costume made of intricately woven *pua kumbu ikat* textiles offer a magnificent image of the Ibans. All of these complete the images of traditional culture when tourists visit an Iban longhouse.

For the time being, in Sarawak, there are very little tourist attractions which portrays the Iban traditional cultural image. The well-known Sarawak Cultural Village located in Kuching which houses traditional settlements of most of the main local tribes of Sarawak preserves the exotic way of their daily life. Tucked away at the foothills of legendary Mount Santubong, 35 km from Kuching, it is Sarawak's fascinating award winning cultural showcase, which is also the venue for the World Harvest Festival and the Rainforest World Music Festival, an internationally renowned festival.

This living museum which is wholly owned by the Sarawak Economic Development Corporation (SEDC) depicts the heritage of the major racial groups in Sarawak and conveniently portrays their respective lifestyle amidst 14 acres of tropical vegetation. Here, it is possible to see Sarawak's ethnic diversity at a glance. The handicraft is both bewildering and tempting, including the *Kain Songket* (Malay cloth with gold inlay), Pua Kumbu (Iban housewives textiles), Melanau Terendak (sunhat), *Bidayuh tambok* (basket), *Iban parang* (swords), *Orang Ulu* wood carving and Chinese ceramics. The 45-minute cultural performance of songs, dances and entertainment is something you will not want to miss during your visit to Sarawak.

There are also tours to Iban longhouses. The types of longhouse tours influence how tourists would interact with the Iban people. Most of the Iban longhouse tours focus on the 'cultural sightseeing' at exotic longhouses buildings which portray ornaments such as trophy skulls, tattooed men, and costumed dancers emphasized as objects for the tourists' gaze. Some tours now provide a more informal 'meet the people' experience (Zeppel 1993) where the tour guides would encourage social interaction, where the tourists sit down with the Iban people and their routine activities.

However, besides longhouses being showcases, Iban people are continuing to live in modern setups. The question is that, do the traditions of longhouses need to be remembered or Ibans have to compromise or sacrifice that for the sake of the choice of developers. At some point in future, the Ibans will definitely search for the lost identity. So, it is up to sensible designers or policy makers to restore the cultural heritage of longhouses, and find a way to customize it to modern setup before it is too late.

5.   Conclusion

Ibans are a strong tribe and they showed in the past that they are able to defend and protect their culture and tradition from extinction. A modern interpretation of longhouses is thus a key instrument to keep that tradition alive. That will effectively unite the Ibans of today with their ancestors without losing their identity.

Acknowledgements

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A microeconomic formulation of social enterprises

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Abstract

A social enterprise is an organization which applies commercial strategies to maximize its own objectives rather than profit maximization, and has the following characteristics, (i) sociality (ii) self sustainability (iii) innovativeness. We formulate one aspect of behaviors of such social enterprises using micro economic models. In our model, a social enterprise is supplying a differentiated good in appropriate quality to maximize some objective function rather than profit. We show that the innovativeness does not necessarily imply high quality. And when the market equilibrium condition is not imposed the consumer surplus is greater and there exists excess demand. We also show that the consumer surplus and the price are increased and the sufficiency rate of the demand is decreased as the enterprise raises the quality of the good.

Key words: social enterprise, self sustainability, consumer surplus, quality, sufficiency rate

1. Introduction

In this paper, we formalize social enterprises. The precise definition of social enterprise is different among organizations or individuals, who use the term "social enterprise". In general, it is said that a social enterprise is an organization that applies commercial strategies to maximize some objective rather than profit maximization. We can also say that a social a social enterprise is an organization, which has the following characteristics; (i) sociality, (ii) self-sustainability, (iii) innovativeness. Here the sociality implies that the enterprise is focusing on some problems that solutions are demanded socially, rather than profit maximization. The self sustainability implies that that the enterprise can exist and be doing activities without any external fund or aid. The innovativeness implies that the enterprise is expected to perform innovation of ways of production or consumption. That is, it may change quality of goods or services it supplies.

Shiozawa[2012] compares NPO, philanthropic activities by private firms and government sector, and discusses which organization is most appropriate for specified social problems. And Shiozawa[2013] formulates philanthropic activities by private firms as enlightened self interest to maximize long-term profit, and points out that expenditures on philanthropic activities decrease as opportunity cost of philanthropic activities increase.

Defoumy and Nyssens[2010]、[2012] investigate international comparison about decision making process and governance structure of social enterprises by using social science approaches. They say that the objectives of social enterprises are factors which have significant effects on institutional environment of the society, such as keeping employment of social minority. As they point out, the concept of social enterprise has various characteristics, and social enterprises are investigated in many aspects or methodology.

Here we formulate one aspect of the activities of social enterprises, and compare them to those of profit maximizing enterprises and derive some implications. We presume that the social enterprise produces a differentiated good and sells at some positive price to get revenue for the self sustainability. And the enterprise considers the quality of the good, and supplies the good in an appropriate quality and sets price to maximize consumer surplus under zero profit condition which comes from the self sustainability. We consider both the cases where the market equilibrium condition is imposed and is not imposed. In each case we derive the optimal quantity and quality of the good. We show that the innovativeness of the social enterprise does not necessarily imply high quality of the good it supplies. And when the market equilibrium condition is not imposed the consumer surplus is greater and there exists excess demand. We also show that the consumer surplus and the price are increased and the sufficiency ratio of the demand is decreased as the enterprise raises the quality of the good.

2. The model

2-1.Basic assumptions

Consider an enterprise, which supplies a differentiated good. Let y denote quantity of the good, and let α be a single parameter, which represents quality of the good.

Definition 1. The good is of *standard quality* when $\alpha = 1$, is of *high quality* when $\alpha > 1$, and is of *low quality* when $\alpha < 1$.

The willingness to pay to the good by the consumers is a function of quantity y and quality α, and we denote

$$w(y, \alpha) \tag{1}$$

The quantity demanded of the good by the consumers is a function of the price p and the quality α of the good, and we denote by

$$w^{-1}(p, \alpha) \tag{2}$$

For the same level of α, w^{-1} is the inverse function of w, that is,

$$w^{-1}\{w(y, \alpha), \alpha\} = y \tag{3}$$

The cost of the good is the function of quantity y and quality α, and we denote

$$C(y, \alpha) \tag{4}$$

When the price p set by the enterprise, the quantity y and the quality α supplied by the enterprise satisfy the following condition

$$p = w(y, \alpha) \tag{5}$$

or

$$y = w^{-1}(p, \alpha) \tag{5'}$$

then the quantity demanded is equal to the quantity supplied. Equation (5) is the condition for market equilibrium. And when we have

$$p < w(y, \alpha) \tag{6}$$

or

$$y < w^{-1}(p, \alpha) \tag{6'}$$

for price p, quantity y and quality α, then there exists excess demand for the good, and the good should be allocated in some way rather than the market mechanism.

In general, the objective function of the firm is defined as a function of quantity y and quality α denoted by

$$\varphi(y, \alpha) \tag{7}$$

In the case of ordinal profit maximizing firms which supply differentiated goods, the price p is set to be equal to marginal evaluation $w(y, \alpha)$, and we have the following as the objective function.

$$\varphi(y, \alpha) = w(y, \alpha)y - C(y, \alpha) \tag{8}$$

On the other hand, the sociality of the social enterprise implies that the enterprise has its own objective function rather than profit maximization. Here we define the objective function of the social enterprise as the social surplus.

And the self-sustainability of the social enterprise implies that the profit is nonnegative. Here we introduce the zero profit condition as follows.

$$py = C(y, \alpha) \tag{9}$$

That is, the total revenue should be equal to the total cost.

When there is no fixed cost, zero profit implies zero producer surpluses, so that consumer surplus is equal to social surplus. The consumer surplus is defined as integral of marginal evaluation function minus payment by consumers. By zero profit condition (9), the payment to the enterprise is equal to the total cost. Hence the objective function is expressed as follows.

$$\varphi(y, \alpha) = \int_0^y w(y, \alpha)dy - C(y, \alpha) \tag{10}$$

The innovativeness of the social enterprise may generally imply that the enterprise creates some kind of new social way of life. Here we presume that the social enterprise chooses the level of quality, which is the most appropriate for the social surplus maximization.

Definition 2. A *profit maximizing enterprise* is a firm which maximizes the objective function (8) supplying the good of standard quality, and a *social enterprise* is a firm which maximizes the objective function (10) under zero profit constraint (9) supplying the good of most appropriate quality.

We specify the marginal evaluation function, the demand function and the cost function by the following assumptions. And we compare behaviors of a profit maximizing enterprise and a social enterprise.

Assumption 1. $\quad \dfrac{\partial w}{\partial y} \equiv -\beta < 0, \dfrac{\partial w}{\partial \alpha} \equiv b > 0 、 w(0, \alpha) = b\alpha$

This assumption implies that the marginal evaluation function and the demand function are represented in the following forms.

$$w(y, \alpha) = b\alpha - \beta y \tag{11}$$

$$w^{-1}(p, \alpha) = \frac{b\alpha - p}{\beta} \tag{11'}$$

Assumption 2.

$$\frac{\partial C}{\partial y} > 0, \frac{\partial^2 C}{\partial y^2} > 0, \frac{\partial^3 C}{\partial y^3} = 0, \frac{\partial C}{\partial \alpha} > 0, \frac{\partial^2 C}{\partial \alpha^2} > 0, \frac{\partial^3 C}{\partial \alpha^3} = 0, \frac{\partial^2 C}{\partial y \partial \alpha} > 0, C(0, \alpha) = 0$$

This assumption implies that when we set $C(1, 1) \equiv m$ then the cost function $C(y, \alpha)$ is specified as follows.

$$C(y, \alpha) = m\alpha^2 y^2 \tag{12}$$

2-2. The profit maximizing enterprise

The behavior of the profit maximizing enterprise is formulated as follows.

$$\max. \ w(y, 1)y - C(y, 1) \tag{13}$$

By Assumptions 1 and 2, when the quality is standard, that is, $\alpha = 1$, the problem (13) is

$$\max. (b - \beta y)y - my^2 \tag{14}$$

The first order condition is

$$b - 2\beta y - 2my = 0 \tag{15}$$

That is, the marginal revenue is equal to the marginal cost. And the optimal quantity y_p supplied by the profit maximizing enterprise is

$$y_p = \frac{b}{2(\beta + m)} \tag{16}$$

And the price p_p is set to be equal to the marginal evaluation (1) at the quantity (16), so that the market equilibrium condition (5) is satisfied.

$$p_p = \frac{b(\beta + 2m)}{2(\beta + m)} \tag{17}$$

The consumer surplus φ_p is

$$\varphi_p = \frac{b^2\beta}{8(\beta+m)^2} \qquad (18)$$

2-3. The social enterprise — under the market equilibrium condition —

Under the market equilibrium condition (5) and zero profit condition (9), the problem of the social enterprise which maximizes the objective function (10) is

$$\max . \int_0^y w(y,\alpha)dy - C(y,\alpha) \qquad (19)$$
$$s.t.\ w(y,\alpha)y - C(y,\alpha) = 0$$

By Assumptions 1 and 2, the market equilibrium condition (5) and zero profit condition (9) are expressed as follows.

$$py = w(y,\alpha)y = (b\alpha - \beta y)y = m\alpha^2 y^2 = C(y,\alpha) \qquad (20)$$

That is, the price, the marginal evaluation and the average cost should be the same. Hence the quantity supplied y_{s1} which satisfies condition (20) is expressed as the function of quality α as follows.

$$y_{s1}(\alpha) = \frac{b\alpha}{\beta + m\alpha^2} \qquad (21)$$

The price p_{s1} is set to be equal to the average cost, depending on quality α, so that

$$p_{s1}(\alpha) = AC\{y_{s1}(\alpha),\alpha\} = \frac{mb\alpha^2}{\beta + m\alpha^2} \qquad (22)$$

When the enterprise supplies the good in the standard quality under the zero profit condition (9), the quantity y_{s1} is

$$y_{s1}(1) = \frac{b}{\beta + m} \qquad (23)$$

The price p_{s1} is equal to the average cost, that is

$$p_{s1}(1) = AC\{y_{s1}(1),1\} = \frac{mb}{\beta + m} \qquad (24)$$

The consumer surplus is

$$\varphi\{y_{s1}(1),1\} = \frac{\beta b^2}{2(\beta + m)^2} \qquad (25)$$

We compare the social enterprise supplying the good in the standard quality with the profit maximizing enterprise.

$$y_p = \frac{b}{2(\beta+m)} < \frac{b}{\beta+m} = y_{s1}(1) \qquad (26)$$

$$\varphi_p = \frac{\beta b^2}{8(\beta+m)^2} < \frac{\beta b^2}{2(\beta+m)^2} = \varphi\{y_{s1}(1),1\} \qquad (27)$$

That is, the quantity supplied by the social enterprise is greater than the quantity supplied by the profit maximizing enterprise, and the price set by the social enterprise is lower than the price set

by the profit maximizing enterprise. And the consumer surplus by the social enterprise is much greater than that by the profit maximizing enterprise.

When the social enterprise considers quality of the good based on the innovativeness, by Assumptions 1 and 2, the objective function (10) under the zero profit condition (9) is expressed as follows.

$$\varphi(y, \alpha) = \int_0^y w(y, \alpha)dy - C(y, \alpha) = \frac{\beta y^2}{2} \qquad (28)$$

From (21) which express the quantity satisfying the market equilibrium condition and the zero profit condition, the quality α which maximizes the objective function (28) is given by the following first order condition.

$$\frac{\partial \beta y^2 / 2}{\partial \alpha} = \frac{b^2 \alpha \beta (m\alpha^2 + \beta)^2 - 2(m\alpha^2 + \beta)\alpha^3 mb^2 \beta}{(m\alpha^2 + \beta)^4} = 0 \qquad (29)$$

So that the optimal quality is

$$\alpha^* = \left(\frac{\beta}{m}\right)^{1/2} \qquad (30)$$

Therefore we have

$$\beta > m \Rightarrow \alpha^* > 1$$
$$\beta = m \Rightarrow \alpha^* = 1 \qquad (31)$$
$$\beta < m \Rightarrow \alpha^* < 1$$

That is, in the case where the quality is standard, when the average cost per unit $m = C(1, 1)$ is less than the rate of decrease in marginal evaluation $\beta = -\frac{\partial w}{\partial y}$, then the quality of the good supplied by the social enterprise is high, and vise versa.

For the good in the optimal quality (30), the optimal quantity is

$$y_{s1}(\alpha^*) = \frac{b}{2m^{1/2}\beta^{1/2}} \qquad (32)$$

And the price is

$$p_{s1}(\alpha^*) = \frac{b\beta}{2m^{1/2}\beta^{1/2}} \qquad (33)$$

The consumer surplus is

$$\varphi\{y_{s1}(\alpha^*), \alpha^*\} = \frac{b^2}{8m} \qquad (34)$$

Compare these values with those of the profit maximizing enterprise. Whenever $m \neq \beta$, we have

$$(m + \beta)^2 - (2m^{1/2}\beta^{1/2})^2 = (m - \beta)^2 > 0 \qquad (35)$$

So that we have

$$m + \beta > 2m^{1/2}\beta^{1/2} \qquad (36)$$

which implies

$$y_p = \frac{b}{2(m+\beta)} < y_{s1}(1) = \frac{b}{m+\beta} < \frac{b}{2m^{1/2}\beta^{1/2}} = y_{s1}(\alpha^*) \qquad (37)$$

And we have

$$\frac{b^2}{8m} - \frac{\beta b^2}{2(\beta+m)^2} = \frac{b^2(\beta-m)^2}{8m(\beta+m)^2} > 0 \qquad (38)$$

So that we have

$$\frac{\beta b^2}{2(\beta+m)^2} < \frac{b^2}{8m} \qquad (39)$$

which implies

$$\varphi_p = \frac{\beta b^2}{8(\beta+m)^2} < \frac{\beta b^2}{2(\beta+m)^2} = \varphi\{y_{s1}(1),\,1\} < \frac{b^2}{8m} = \varphi\{y_{s1}(\alpha^*),\,\alpha^*\} \quad (40)$$

Therefore we have the following proposition.

Proposition 1. Under assumptions 1 , 2 and the market equilibrium condition, the quantity supplied and the consumer surplus by the social enterprise are greater than those by profit maximizing enterprise. In the case where the quality is standard, when the average cost per unit $m = C(1, 1)$ is less than the rate of decrease in marginal evaluation $\beta = -\frac{\partial w}{\partial y}$, then the quality of the good supplied by the social enterprise high, and vise versa.

This proposition says that the social enterprise which considers quality of the good supplies the good in low quality, when $m > \beta$. However even in that case, the consumer surplus is greater than that by a profit maximizing enterprise. This implies that the benefit of consumers can be increased by goods without unnecessary characteristics which cost more. For example, less expensive computers without unnecessary functions are more appropriate for most consumers in terms of welfare than expensive computers with many functions. In some sense, a kind of plain way of life based on goods or services of low quality supplied by the social enterprises may be a new social way of life.

Figure 1.

18
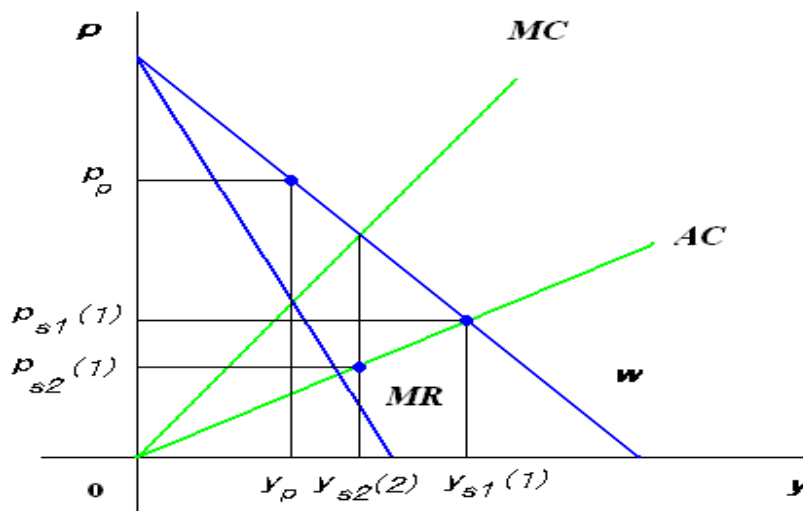
2-4. The social enterprise — without the market equilibrium condition —

The problem the social enterprise faces under the zero profit condition (9) and Assumptions 1 and 2 without the market equilibrium condition (5) is

$$\max . \int_0^y w\,dy - C(y, \alpha) = \frac{1}{2}\{b\alpha + (b\alpha - \beta y)\}y - m\alpha^2 y^2 \qquad (41)$$

The first order condition with respect to quantity y is

$$b\alpha - \beta y - 2m\alpha^2 y = 0 \qquad (42)$$

That is, the marginal evaluation $b\alpha - \beta y$ is equal to the marginal cost $2m\alpha^2 y$. Hence the optimal quantity y_{s2} in this case is represented by the function of quality α as follows.

$$y_{s2}(\alpha) = \frac{b\alpha}{\beta + 2m\alpha^2} \qquad (43)$$

By the zero profit condition (9), the price p_{s2} is set to be equal to the average cost at $y_{s2}(\alpha)$.

$$p_{s2}(\alpha) = \frac{mb\alpha^3}{\beta + 2m\alpha^2} \qquad (44)$$

The consumer surplus is

$$\varphi\{y_{s2}(\alpha), \alpha\} = \frac{b^2\alpha^2}{2(\beta + 2m\alpha^2)} \qquad (45)$$

When the social enterprise supplies the good in standard quality, the quantity supplied y_{s2} is

$$y_{s2}(1) = \frac{b}{\beta + 2m} < \frac{b}{\beta + m} = y_{s1}(1) \qquad (46)$$

The price p_{s2} is

$$p_{s2}(1) = \frac{mb}{\beta + 2m} < \frac{mb}{\beta + m} = AC\{y_{s1}(1), 1\} \qquad (47)$$

The consumer surplus is

$$\frac{b^2}{2(\beta + 2m)} > \frac{\beta b^2}{2(\beta + m)^2} = \varphi\{y_{s1}(1), 1\} \qquad (48)$$

That is, the consumer surplus without market equilibrium condition (5) is greater than the consumer surplus under the market equilibrium condition.

However the price $p_{s2}(\alpha)$ is set lower than the marginal evaluation of $y_{s2}(\alpha)$, so that there is excess demand. Hence there exists a group of consumers who can buy the good, and there also exists another group of consumers who can not buy the good even though they want to buy at that price.

By partially differentiate the consumer surplus (45) with respect to quality α, we have

$$\frac{\partial b^2\alpha^2 / 2(\beta + 2m\alpha^2)}{\partial \alpha} = \frac{4b^2\alpha\beta}{4(\beta + 2m\alpha^2)^2} > 0 \qquad (49)$$

This implies that the social enterprise has an incentive to enhance quality of the good it supplies. And by differentiating the price (44) with respect to quality α, we have

$$\frac{\partial p_{s2}(\alpha)}{\partial \alpha} = \frac{3mb\alpha^2\beta + 2m^2b\alpha^4}{(\beta + 2m\alpha^2)^2} > 0 \tag{50}$$

so that the price is also increased as the quality is increased.

On the other hand, the quantity supplied is increased at first and then decreased as the quality α is increased. By differentiating the quantity supplied $y_{s2}(\alpha)$ with respect to the quality α we have

$$\frac{\partial y_{s2}(\alpha)}{\partial \alpha} = \frac{b\beta - 2mb\alpha^2}{(\beta + 2m\alpha^2)^2} \tag{51}$$

It implies that the quantity supplied $y_{s2}(\alpha)$ is maximized at $\alpha = \left(\dfrac{\beta}{2m}\right)^{1/2}$.

In the case where the market equilibrium condition (5) is not imposed, the quantity demanded is not equal to the quantity supplied in general. Hence we define the sufficiency rate of the demand as follows.

Definition 3. Given the price p, the quantity supplied y and the quality α, the ratio $e \equiv \dfrac{y}{w^{-1}(p,\alpha)}$ of y to the quantity demanded $w^{-1}(p,\alpha)$ at p and α is called the *sufficiency rate of the demand*.

Whenever the market equilibrium condition (5) is satisfied, the sufficiency rate of the demand is of course equal to 1.

Under Assumptions 1 and 2, when the social enterprise is supplying the quantity (43) $y_{s2}(\alpha) = \dfrac{b\alpha}{\beta + 2m\alpha^2}$ at the price (44) $p_{s2}(\alpha) = \dfrac{mb\alpha^3}{\beta + 2m\alpha^2}$ which is equal to the average cost, the sufficiency rate of the demand is

$$e = \frac{\beta}{\beta + m\alpha^2} \tag{52}$$

By differentiating (52) with respect to quality α, we have

$$\frac{\partial e}{\partial \alpha} = \frac{-2m\alpha\beta}{(\beta + m\alpha^2)^2} < 0 \tag{53}$$

So that the sufficiency rate of the demand is decreased as the quality of the good is increased.

Then we have the following proposition.

Proposition 2. In the case of supplying the good of the standard quality, the social enterprise without the market equilibrium condition supplies less quantity, sets higher price and realizes greater consumer surplus than those by the social enterprise under the market equilibrium condition. When the social enterprise without the market equilibrium condition raises the quality of the good, the consumer surplus is increased and the sufficiency rate of the demand is decreased.

Without the market equilibrium condition, the higher the quality of the good, the more is the consumer surplus of people who can get the good, while the ratio of people who can not get the good is increased. This is because the objective function of the social enterprise is defined as the total consumer surplus in the market, and it does not matter distribution of the good among consumers.

Figure 2.

20
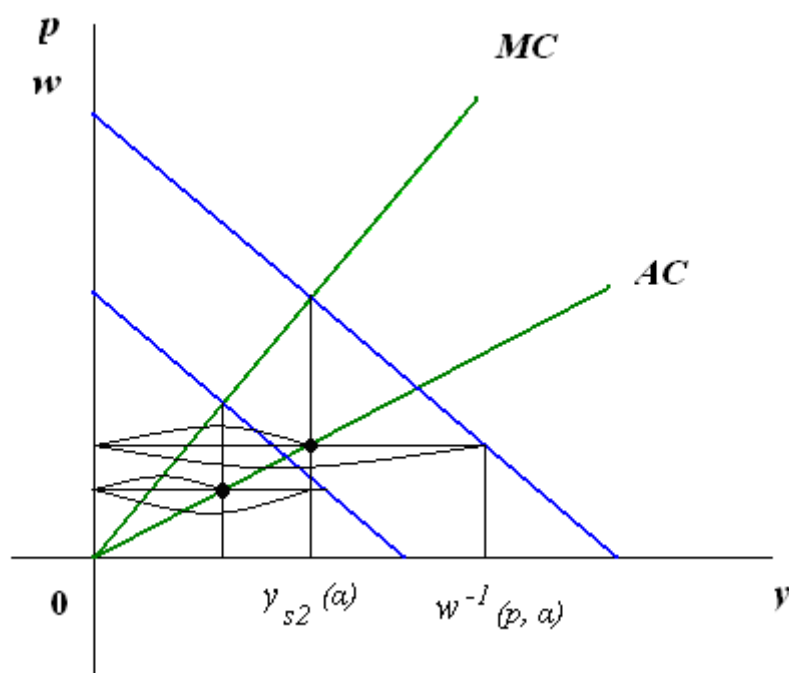
3. Concluding remark

In this paper we have formalized social enterprises as entities supplying differentiated goods at positive prices, by using simple microeconomic models. The objective of the social enterprise is defined as the total consumer surplus in the market. The social enterprise under the market equilibrium condition supplies more quantity of the good, sets lower price and realizes greater consumer surplus than those by the profit maximizing enterprise.

For the quality of the good, the social enterprise does not necessarily supply the good of higher quality than the good supplied by the profit maximizing enterprise. The quality of the good supplied by the social enterprise depends on the marginal evaluation by the consumers and the cost function. Even when the social enterprise is supplying the good of low quality, the consumer surplus is greater than that by the profit maximizing enterprise or by the social enterprise supplying the good of the standard quality. This implies that the social enterprise reduces the amount of resources used for unnecessary characteristics or functions. For example, personal computers with a few basic functions at a lower price may make more consumer surplus than personal computers with so many functions at a higher price. This implies that some kind of plain way of life may become a social model of new way of life. To supply the good of optimal quality, the social enterprise needs correct information about evaluations by consumers as well as cost functions. Otherwise the social enterprise supplies the good of too high quality or too low quality, with which the consumer surplus is not maximized, and some resources are wasted.

The social enterprise without the market equilibrium condition supplies less quantity, but realizes greater consumer surplus than the social enterprise under the market equilibrium condition. However in that case, the price is set lower than the market equilibrium price. Therefore there exists excess demand for the good, that is, there exist consumers who are willing to buy the good at the price, but cannot afford. This is because the objective function is defined as total consumer surplus, and it does not matter to distribute among consumers. In such a situation it is shown that when the quality is increased the consumer surplus is increased while the price is increased and the sufficiency rate of the demand is decreased.

In the real world, there are consumers who can get child care service at some reasonable price while there are some other consumers who are waiting for child care service or have to get at

some quite higher price. If the market equilibrium condition is imposed there might not be consumers who are willing to purchase the service at the equilibrium price but cannot get, while there exist consumers who can not get any child care service. This is because the objective function is defined as total consumer surplus in the market. To analyze such a problem, we have to set an objective function of the social enterprise considering distribution of the good among the consumers.

For innovativeness concerning to a new social standard of living, we have to consider not only a present state of the society but also a future state, including creation of new goods or services. And for that sake we may need some dynamical formulation. These deserve further research.

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Assessment of Digital Architectural Design Education at Covenant University Ota, Nigeria

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Abstract

Digital architectural design education involves the integration of software, curriculum, infrastructure, personnel and methods of knowledge transfer. This paper provides an assessment of digital architectural design education at Covenant University Ota, a leading private university in Nigeria, with the purpose of improving teaching, learning process and learning environment. AutoCAD and Revit Architecture are the teaching software. The survey was conducted through the Google Docs platform using an e-questionnaire. The study found students performance in digital design studio and related courses better in the (Alpha) semesters than in the (Omega) semesters. It was also revealed that the students found 3dimensional modelling and rendering very challenging. Most students recorded appreciable skill improvements within three months prior to the survey. The learning environment was perceived as being of good quality. It is recommended that more focus be given to 3d modelling; correct process of detailing; Staff training and sustenance of the learning environment.

Keywords: Architecture, Digital Design, Education, Google docs, and learning environment

1.0   Introduction

The information age has brought with it waves of digital technologies that has swept across all facets of human endeavour. These innovative technologies has brought with it technological, social and economic transformations in our traditional ways of living and working. Florida (2004) argued that a country's economic competitive edge and destiny to stay on top in this era of high tech industry is tied directly to its openness to new ideas, which will allow it to mobilize and harness the creative energies of its people.

The architecture industry expectedly has embraced digital technology even though a little later than the ship building and engineering industry with Frank Ghery Architects as one of the early adopters as reported by Kolarevic (2002). Digital technology has transformed the architecture industry in ways that cannot be imagined a few decades ago, Peter Zellner observed in Hybrid space cited by Kolarevic (2002):

> "*Architecture is recasting itself, becoming in part an experimental investigation of topological geometries, partly a computational orchestration of robotic material production and partly a generative kinematic sculpting of space*".

The study asserts that in the last few years advances in computer aided design CAD and computer aided manufacturing CAM technologies have started having impact in the way we design and construct buildings. This has opened up new opportunities by allowing production and construction of very complex forms that were previously very difficult and expensive to actualize using traditional construction technologies. Architectures are emerging from the digital revolution, showcasing architectures that have found their expression in highly complex curvilinear and amorphous forms that will gradually enter the mainstream of architectural practice in the coming years. Digital technologies are currently employed as an enabling apparatus that digitally integrates conception and production in ways that are unprecedented since the medieval times of master builders.

2.0   Digital Architectural Design Education

Architecture without digital technology is gradually and most assuredly going into extinction. The deployment of digital technology in architectural design in now the norm, Salman *et al.* (2006) posited that digital technologies are challenging the theories and practice of traditional architectural design both from educational and practical perspectives. Sa'ad (2001) stated that the main factors determining architectural development in the next few decades globally have been identified as the following, Technological innovations, especially information technology (IT), concern for the environment, financial management and democratization of decision making. The study further posited that the manifestation of the forces of change can be identified globally in the following spheres of operation, architectural practice and architecture, building industry and the educational system.

However, Bricken (2005) stated that design technologies become commercially available before being discussed and understood academically. Amole (2000) argued that architectural educators should not take its entire cue from what obtains in practice, but rather it ought to act as a propelling force for imposing and enhancing the role of architects in the society. Oxman (2009) posited that the need to accommodate the magnitude of change in professional practice with its new demand of requisite knowledge and skills has confronted this generation of design educators with a new challenge which is to create a theory of architectural education and design pedagogy that acknowledges the scale and quality of theoretical, professional and technological changes that digitally mediated architecture is beginning to exert. Therefore because of this broad cultural shift, it becomes needful to reconsider the theoretical basis, its related knowledge and its design methods in relation to emergent digital technologies. Bhatt *et al.* (2006) stated that Computer Aided

Architectural Design (CAAD) is a discipline capable of transforming the future of architectural design by providing architects with the foundation of knowledge on which they can conceptualize possibilities, invent new techniques to deal with familiar problems, and discover innovative ways of practicing architecture.

CAAD has been integrated in the curriculum of architectural education around the world with varying degree of success and methods. CAAD research has been considered to be complex and diverse and the major reasons according to Salman et al. (2008), is the increased frequency of new ideas that have not been grounded on early work. According to Achten (1996) there are four computer systems in education: social systems, professional systems, educational systems and innovative systems. Social systems are described as computer tools which all students should be conversant with at the point of entry into higher institution and be able to use within any higher education curriculum. Professional systems are computer tools deployed in architectural practice such as AutoCAD, ArchiCAD and Revit architecture. Usually these systems utilize off-the-shelf software, that is, software developed by standard software companies such as Autodesk, Graphisoft, and Microsoft. Educational systems are modified professional systems to convey specific pedagogical purposes and are developed within or for a specific architectural institution and sometimes are result from research. Innovative systems are computer systems that go beyond current state of the art of professional systems such as automated plan recognition and virtual reality design systems. They are always the consequence of research work; hence they are so-called home-made software. The social and educational systems have been integrated in most architecture schools, while the level of integration of educational and innovative systems is directly proportional to the depth of CAAD research in an institution. Researches are ongoing in most school of architecture to deploy the professional systems in education as a generative design media rather than a representational tool of conceptualized design proposal.

3.0   Challenges and Achievements of Digital Architectural Design Education in the University

Digital technologies were first integrated into the architectural curriculum at the University in the 2004/2005 academic session at the 300 level class of the undergraduate programme. Two dimensional drawings with digital media was taught at that level and the following academic session the 400 level students were taught three dimensional drawings using digital media. The computer tool used for these courses was the AutoCAD software and the method of learning was basically to master the use of the software with examples on how to use it to represent architectural design solutions. During the 2006/2007 academic session after a training programme conducted by Autodesk and the National Universities Commission of Nigeria (NUC) and armed with Autodesk and Revit software donated to the university by Autodesk, the building information modelling (BIM: ARC419 and ARC429) was introduced at the final year of the undergraduate programme. The introduction of BIM led to the restructuring of the curriculum of architectural education at Covenant University, two-dimensional AutoCAD was moved to 200 level, three-dimensional AutoCAD was moved to 300 level and building information modelling was taught at 400 level. At the 2007/2008 academic session a course titled The Theory and Practice of Design Computing was introduced at the second year of the Master of Science (M.Sc) architecture programme of the university. This course is basically to prepare the students for life in architectural practice by introducing them to the principles of solving architectural issues using the principles of CAAD and also enlightens the student on the principles of digital fabrication.

The architecture department of the University has a 100 seat digital design studio (DDS) dedicated for lectures in CAAD for undergraduate students while the programme at the master's degree level has been revolutionized by the introduction of two (2 No.) 42 seat E-studios for MSc 1 and MSc 2 respectively. At the time of this study, there is freedom of conceptualization of design solutions at the master degree level, some of them begin with free hand sketches before finalizing

their designs with CAAD, while some go straight to the computers for generation of their design concept. This milestone reached at Covenant University has not been favoured by educators who do not share the opinion that CAAD should be a primary media for studio design works. This has led to the restrictions of the use CAAD to only the DDS classes in the undergraduate levels and are not accepted in the traditional design studio, however the students who are in the age bracket classified as digital natives (Cespedes, 2008) have tried to bypass this rule by producing their work in CAAD, printing it on tracing or cardboard paper and embellishing with pen and ink. Scapegoats have been penalized by the department in various forms, but the practice still persists. The curriculum at present has been restructured by moving CAAD courses away from 200 level and to start them at 300 level. This is supported by the position that the design conversation and thinking is more effective through brain and hand communication on paper and that computer impedes that natural flow. It is widely reasoned that it will be difficult to correct if that process is lost at the early stage of design education. This position requires more research findings and empirical data to prove it veracity. This is contrary to the position of (Venkatesh *et al.* 2003, 2012) on the unified theory of acceptance and use of technology which says that age, gender and experience will moderate the effect of hedonic motivation on behavioural intention, such that the effect will be stronger among younger men in early stages of experience with technology. Despite all the challenges there are bright spots to be noted as well. The graduates of the University's architecture programme are highly sought after by employers in the Nigerian built environment, on one occasion a company requested twenty graduates from the University who are proficient in BIM for immediate employment.

4.0   Methodology

The survey instrument used for the study is an electronic questionnaire developed by the researchers on the Google Docs platform. The questionnaire was sent to the emails of the 200 level - 400 level students and the M.Sc 1 students (a total of 230 students). At the expiration of the time scheduled for the survey, seventy (70) responses were received accounting for 30.44% of the population. Several reasons were responsible for this response rate, which include email delivery problems for wrong addresses; challenges with Internet connectivity; and for very few, lack of interest in participating in the survey.

The survey questionnaire consists of 12 short questions covering student's information, software/hardware characteristics, usage information, user evaluation of learning environment, and related courses and suggestions. The first phase of this study presents descriptive statistics as generated by the Google Docs platform and discusses the analysis.

5.0   Discussion of Findings

Forty four students representing 63% of the respondents were male while the remaining twenty six (37%) were female. The university runs two semesters per session which are called the Alpha semester and the Omega semester. The study measured the performance of the responding students in related courses in the previous session and found that in the alpha semester, 54% of the respondents scored A grade while 24% had B. Furthermore 19% of the respondents scored C grade while the remaining 3% did not declare their results. However the Omega semester was not as successful as the Alpha semester since only 37% of the respondents had A while 30% had B, 26% had C scores while 3% had D. However 4% of the respondents did not declare their results. Twelve more students had A in the alpha semester than the Omega semester. Nineteen more students representing 13% of the respondents performed better in the Omega semester scoring B and C grades. The courses investigated were Arc113 (Introduction to Architecture) and Arc123 (Basic Elements of Planning) which introduce the students to the study of architecture. The other courses include Arc212, 222,319, 329, 419 and Arc429 which teach the various levels of CAAD and BIM, its use in design evolution and implementation. Figure 1 and Figure 2 show the charts describing the students' performance in these courses and during the semesters concerned.
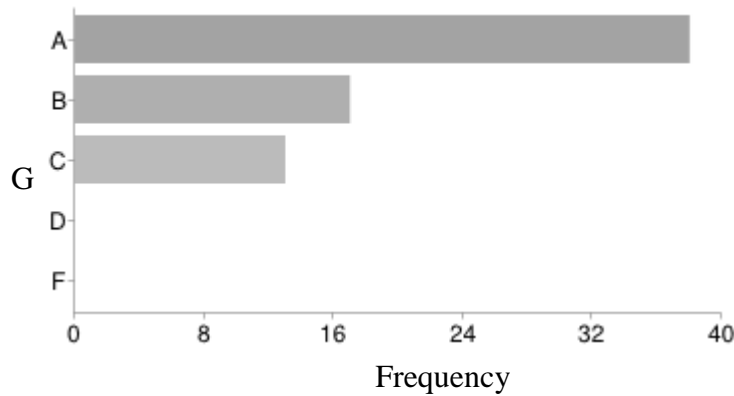
Figure 1: Students' Performance in Alpha Semester
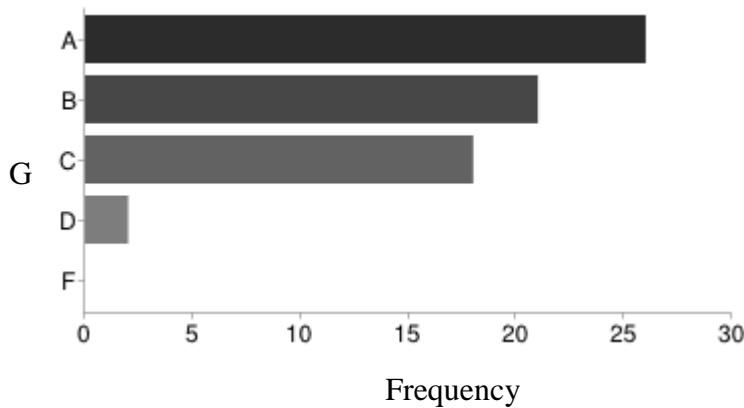
Figure 2: Students' Performance in Omega Semester

The study found that many students had challenges in the mastery of 3D modelling (37, 53%) and Rendering (20, 29%) but were more confident in dealing which line weights, dimensioning and drawing layers as shown in Figure 3. Fortunately 81% of respondents agree that the software taught were easy to use while all respondents agree that the software taught were useful to them either presently or in the future. A chart visually explaining these facts is shown in Figure 4.

Most respondents 49% record good estimated skills improvement in the three months prior to study while 22% and 12% record very good and excellent estimated skills improvement in the same period. A minority 1%, record poor estimated skills improvement and manageable estimated skills improvement respectively. The study found higher levels of proficiency among respondents in the use of AutoCAD than Autodesk Revit architecture. Most respondents 66% possessed above average proficiency in AutoCAD while 23% of the respondents could boast of same proficiency level in Revit Architecture.

Frequency
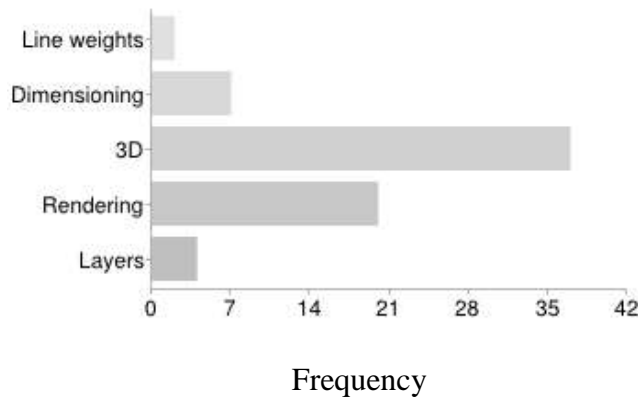
Figure 3:   Areas of Difficulty in Learning CAAD and BIM
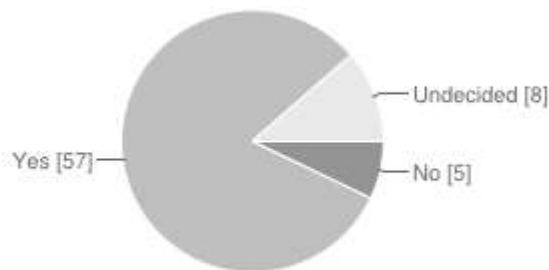
Figure 4:   Ease-of-use of available Software

Frequency
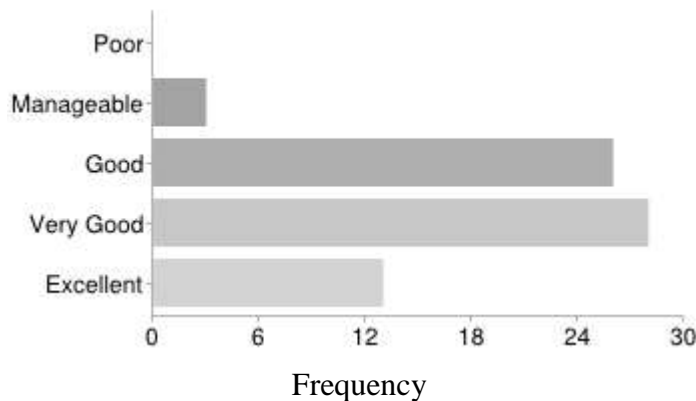
Figure 5:   Students' perception of CAAD Studio Environment

The respondents desire to be taught other software like ArchiCAD, SketchUp, Coreldraw, Photoshop, 3D max, Inventor and Lumion 3D. Obviously it is unrealistic to teach all these to all students within a curriculum, but it might be necessary to include some of the popular suggestions in the course content in order to improve the overall student knowledge and skills.

The study environment is crucial to the overall assessment of an educational system, therefore the study sought to find the respondents perception of their CAAD studio environment. The result shows that 37% and 40% perceive the environment as good and very good respectively while 4% perceive it as manageable and 19% as excellent as shown in Figure 5. The general perception places the condition of the digital architecture studio environment as clearly above average.

5.1 Recommendations

The following recommendations are proposed by this study:

1. More teaching focus be given to 3-dimensional modelling; correct process of CAAD detailing and rendering.
2. More CAAD and BIM lecturers and instructors should be trained to increase the quality of teaching and also improve attention given to the students.
3. The learning environment which is the Digital Architectural Design Studios should be maintained and improved upon. These studios are demand huge capital to put in place and equip, therefore it is necessary to keep in proper condition to ensure value of the investments.

6.0 Conclusions

The paper reveals better academic performance in the alpha semester than the omega semester. A further study may be needed to confirm the factors responsible for this occurrence. Areas of difficulty in CAAD and BIM for the students were 3D modelling and rendering. These aspects require diligence and deeper proficiency levels to produce excellent work. The fact that students erroneously believe that software applications remove effort may be associated with this outcome and finding.

It is however heart-warming to find that all respondents agree that the software being taught were useful to them while most of the respondents (81%) agree that these software are easy to use. This explains key elements of the Technology acceptance model which include perceived usefulness and perceived ease-of-use. The paper reveals acceptable skill improvements in the use of the CAAD and BIM software. However there is a clamour for more software to be introduced to the digital studios, the reality is that it is impossible to teach all the desired software with the available human, physical and time resources of any institution. Students still have to pursue personal development in software of preference and desire. One or at the most two of this Software can be introduced into the curriculum to increase media options with additional staffing to ensure optimal results.

Lastly, the studio environment is conducive and this makes learning pleasurable, however this should be constantly maintained and gradually improved upon to meet the growing demands of technology and education.

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Community based approach (CBA) for effective garbage and flood control in Nigerian cities.

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Ogun State Nigeria. 31st December 2013

Abstract:

This paper highlights the need to incorporate the Community Based Approach –Community Based Action Committee (CBA-CBAC) at the household level for refuse disposal and flood control. It also presents data from an evaluation study of environmental sanitation in six communities spread across three Local Government Areas (LGAs) in Lagos State. The paper shows that house hold levels seems to be the best way to start addressing the twin issues of garbage disposal and flood control in Nigerian cities. The major findings regarding refuse disposal include vendors, LAWMA, dumping inside gutters and burning. It therefore suggests result/task oriented use of household resources at the communities to tackle the hydra headed problem of garbage disposal and thereby control annual flood that marooned the Nigerian cities yearly. The expected responsibilities of the Community, Local Government Areas and the State levels were discussed in the paper. The need to incorporate this approach into physical planning in the urban areas is highlighted in this paper.

Key words: refuse, disposal, flood control, community/ward, elites, cities.

Introduction

The world has just crossed the point at which 50 percent of humanity lives in urban areas. Sachs (2003) By around 2020 more than half of the population of developing countries will be urban. Sachs (2003)) Albeit urbanization opens countless opportunities for economic development as the processes also create challenges that can prevent the urban promise from being fulfilled. The responsibility of waste collection and disposal in the whole of Nigeria has traditionally been within the purview of Local government Areas, as entrenched in the constitution of the Federal Republic of Nigeria, 1979 section 7, and Fourth Section (b) (Nigeria 1979 Constitution).

Statement of the Problem

Many Nigerian cities first and foremost need urban planners who should take into account social, cultural and mental state of refuse generation and disposal of same. The generation of refuse emanates usually from individual and house hold levels, thus, any effort therefore that is put in place to dispose garbage must start from the basal level-individual and family levels. Many Nigerian cities usually have big and large markets which are heavily patronized daily or on special days by huge human traffic, these centres generate monstrous garbage too. In Lagos city for year2002 alone, a total of 1,668,104 metric tones of garbage were generated, collected and disposed in landfills sites. Out of this, the total industrial waste collected was 101,776 metric tones, forming only 6.10% of the total waste collected while the rest 1,566,338 metric tones forming 93.90% was domestic waste.(LAWMA 2004) Most of the refuse generated in many Nigerian cities can be divided into two, biodegradable and non-biodegradable. This paper will focus on the former since we shall be concerned with household and community levels.

Generation of garbage is a must, because it is part of living, a side effect of living or even the outcome of living. Human obstinacy and lawlessness are usually responsible for making refuse become sources of irritation or nuisance. This they do, by dropping refuse indiscriminately and by many of their anti-social behaviours such as blocking drains and gutters with garbage that always lead to annual flooding during the rainy seasons. There is no Nigerian city that can be exempted from this yearly problem.

Characteristics of Nigerian Cities

Many of the cities in Nigeria are heavily populated, according to the 1991 census, Lagos had a population of 5.7 million, Kano 5.8 million, Benin City had a population of 2.1, Ibadan had a population of 2.9 and Port Harcourt 2.5 million (NPC1991) In fact Lagos State accounts for about 5% of Nigerian population and a UN study projects reports Lagos to have over 10 million by the year 2000, thus making it to be a mega city. (FHI 200) Most of the Nigerian cities are unplanned with open gutters or drains causing floods everywhere whenever it rains. The only exemption to such ugly scenes of flooding after rains are the GRAs (Government Reserved Areas) and private estates in all Nigerian cities where the elites reside, because they are usually kept free of indiscriminate dumping of garbage they are like oasis in the deserts. Administratively, most Nigerian cities are usually designated as a Local Government Area(LGA) or divided into series of Local Government Areas (LGAs) which are the lowest level of government structure. In each of the LGA, are service functions such as education, information, agriculture, health etc; under health is the branch where environmental health issues are expected to be managed by sanitarians, public health superintendents and other public health officials.

Literature

Most urbanization in many developing countries is a movement by itself, unaccompanied by industrialization and is already resulting in the proliferation of slums and shanty towns and diseconomies rather than economies of scales. This has led to major anti-social activities sand to making the cities unsafe and insecure both for life and property.(Rafael M Salas1980)

Population growth continuously generates an increasing demand for a variety of goods and services. Most of these goods and services such as food, grains fishery products, wood, minerals, water, energy and also how to dispose of waste constitute problem. (Rafael M. Salas 1980) The promotion of growth, alleviating poverty, and protecting the environ --ment are mutually supporting objectives in the long run. In the short run, however, the three objectives are not always compatible, and decision makers often confront difficult choices in pursuing them simultaneously. One of the difficult choices that are usually left within the 'cracks' is garbage management. (World Bank Report 1987) Thus without safe drinking water, the urban poor live in unsanitary conditions and are hurt by most by noise, constant flooding, and refuse pollution. (World Bank Report 1987)   Asimov (1974) has observed that as people multiply and live closer together in cities, all kinds of waste products form in this small area. There are leftover foods ("garbage") and human wastes such as food wrappers, plastics and other discarded and unwanted materials generated in greater quantity that cannot be disposed of are example of "pollution" Part of these refuse end up in drains and gutters, clogging and blocking them, thereby creating flooding and destruction of properties whenever it rains. Here lies the synergistic and close relationship between effective garbage management and flood control. A study funded by Japanese International Cooperation Agency(JICA) in some communities in Lagos in late 2005 put the foregoing in proper perspective. Most of the garbage generation and disposal behaviours in Lagos are very similar to what one finds in other cities in Nigeria.

Theoretical Orientations

The mounting garbage issues are veritable problems in many cities of the developing countries. In urban studies a parallel shift toward a radical orientation has emerged. Castells (1977a) and others have reformulated the urban question. They have attacked the belief that urban form emerges through neutral process of individual process of decision-making. For Castells and Harvey (1973) urban areas and their problems can be understood only in terms of the conflicts between classes, which are a direct outcome of capitalist mode of production, urban form, urban issues, urban governance, and urban ideology which too can be understood only in terms of the dynamic of the capitalist system. Space is socially determined; just like the outcome of conflicts between the different social classes. 'Urban disorder was not in fact a disorder at all: it represented the spatial organization created by market forces and derived from the absence of social control of the industrial activity'(Castell 1977a:14-15) State planning can reduce such disorder but cannot remove it, because resources are allocated on the basis of a struggle between competing groups. Ideally the process of planning allocates these resources fairly all among groups and integrates society through its decisions but unfortunately, it does not operate that way. Those who wield political power influence planning decisions against the interests of the powerless. Planning does not serve the public interest because there is no such interest (Simmie 1974, Saunders 1980) One can therefore explain partially, the orientation of the centralization of garbage control in many cities in Nigeria with the above postulations. The role or the influence of power elite is not left out either, in a world of unequal opportunities it is therefore not surprising that managing cities should also yield unequal outcomes. Indeed it can be argued that cities serve elite groups, one should therefore expect planning methods that perpetuate the power elite which accounts for many Nigerian cities, where the elites have taken over the roles which belongs to the community level for the simple reason of cornering resources and controlling the powerless. In Lagos city for the year 2002, the revenue generated from the collection of refuse, which included the subvention from the State government, and direct deduction from the LGAs waste collection was Naira=N= 291,658,940.00 or 24,804,911.70 per month, while the calculated cost of collection per tones was 191,37 naira. A total number of about 340 commercial and industrial premises are currently being serviced by LAWMA yielding an average of 12 million naira revenue per month.(LAWMA 2004). As a result of centralizing the process, the elites are able to award contracts for refuse pick up at the household level, thus paying huge sums to their

contractors for activities which could have been efficiently handled by community members generating the garbage. One can easily observe the inequality of the elites' position when one discovers that mountain of garbage rarely characterize the exclusive reserved areas and estates sections of the cities where they reside. Close observation by objective individual will reveal that they often ensure prompt removal of their own garbage using government apparatuses.

Aim of the study

The overall aim of the study which was implemented between October and November 2005 was to evaluate the activities of JICA Community Based Health interventions in some six communities after three years of interventions. The interventions include Malaria, child survival activities and environmental sanitation efforts. This paper focuses on environmental sanitation activities.

Study Areas

Surulere LGA is a complete urban area, created out of the Mainland LGA. It has a population of 635,246 according to 1991 census. Some parts of the LGA represent urban slum areas such as Ijeshatedo and Orile communities.

Mushin LGA area is one of the oldest LGA in Lagos State and it is entirely urban. However, there are certain parts of this LGA that can be classified as urban slums such areas include Odo Eran, and Idiaraba communities. According to the National Population Commission figures of 1991, Mushin has a population of 741,778.

Ajeromi Ifelodun LGA was carved out of Ojo LGA. It harbours the most densely populated slums out of the three LGAs specifically, and for the entire State in general. Areas such as Oridilu, and Amukoko of the LGA are sprawling congested houses with little or no ventilation. The population of the LGA according to National Population Commission (NPC) was 815,680 in 1991.

Methodology

Sample Size:

For Surulere LGA, the communities were Ijeshatedo and Orile.

For Ajeromi- Ifedlodun LGA, the communities were Oridilu, Amukoko,

For Mushin LGA, the communities are Odo Eran and Idiaraba.

Based on discussion with the authorities of the three LGAs the

Population of the six communities was put at 63,671 for the current

study The assumption that the Women of Reproductive Age(WRA)also

form fifty percent of the population in any community was also upheld

for this study. This figure 63,671 was divided by 2; this gives us 31,836

and to obtain our sample size, we calculate 5% of the 31,836 and we

arrive 1,591.

Research Instrument

The Research instrument was a questionnaire, divided into seven

Sections to capture information on malaria, Child survival activities such

as immunization activities and environmental sanitation activities.

in the six communities.

The questionnaires were administered on WRA (14-45) years and care givers of children aged below five years. This paper focuses on environmental sanitation with emphasis on refuse disposal**.**

Results

Social-economic Conditions:
Table 1.1: Age of Respondents

	Frequency	Percent
Less than 20 years	56	4.0
21-30 years	618	43.7
31-40 years	487	34.5
41-50 years	112	7.9
50 years and above	37	2.7
No response	103	7.3
Total	1413	100

Over 80% of our respondents fall within the ages 21-45 and this is consistent with the objective of the study to interview women of reproductive age (WRA) This can be seen on the above table.

Table 1.2 Marital Status of respondents

	Frequency	Percent
Single	147	10.4
Married	1167	82.6
Divorced	44	3.1
Widow	19	1.3
Other	7	0.5
No response	29	2.1
Total	1413	100

Again over 80% of our respondents married as depicted by the table above, this also is consistent with the objective of the study.

Table 1.3 Educational level attained by Respondents

	Frequency	Percent
Primary school	342	24.2
Secondary school	729	51.9
Post- Secondary school	251	17.8
No School	66	4.7
Don't know	2	0.1
No response	23	1.6
Total	1413	100

Table 3 shows the low level of education of respondents, only 17.8 % had post- secondary education while 51.6% had secondary and 24% had primary school education.

Table1. 4: Estimated Monthly Income

	Frequency	Percent
Under 10,000 naira	979	69.3
10,000 -20,000	273	19.3
20,001 -30,000	107	7.6
30,001 -40,000	34	2.4
40,001 -50,000	16	1.1
50,001 -60,000	4	0.3
Total	1413	100

Table 4 makes clear that most of our respondents belong to the lower socio economic status only 10% earn between 20,001 and 40,000 naira per month, while 1.4% earn between 40,001 and 60,000 naira per month. A whopping 69.3 % earn less than 10,000 monthly while 19.3 earn between 10,000 and 20,000 naira per month.

Table 1.5: Source of Drinking water

	Frequency	Percent
Borehole	464	32.8
Public taps	460	32.6
Taps inside the house	295	20.9
Bought from the vendor	130	9.2
Stream	52	3.7
No response	12	0.9
Total	1412	100

The sources of drinking water of our respondents are borehole (32.8%) Public taps (32.6%), taps inside the house (20.8%), and Vendor (9.2).

2. Environmental sanitation activities: Respondents said that they usually dispose their refuse through vendors (Surulere 44%, Mushin 19% and Ajeromi 37%). At least 6.3% of our respondents in the three communities dispose their refuse inside the gutters. This certainly represents a very large segment of the population if the entire LGAs and State are considered. One can easily see the relationship between very poor garbage disposal methods and yearly perennial flooding of the entire city of Lagos. They also use LAWMA for refuse disposal (Surulere 23%, Mushin 42%, and Ajeromi 36%) Respondents that are prepared to participate in weekly environmental exercise gave the following information (Surulere 19.1% Mushin 36.4% and Ajeromi 43.7%) while monthly environmental sanitation exercise gave the following information (Surulere 37.1%, Mushin 40.1%, and Ajeromi 23%). Weekly environmental activities seem, to be common where there are large markets such as Ajeromi while residential areas seem to prefer monthly environmental activities such as in Mushin and Surulere. The respondents (75%) believed that government can improve their environment through proper drainage constructions, refuse disposal, proper and involvement of the community members and efficient use of Sanitary Inspectors or Public Health Inspectors preferably at the community levels.

Table 5.2: Method of Refuse disposal

Methods of refuse disposal	Frequency	Percent
Through Vendors	687	48.6
LAWMA	295	20.9
Refuse dumps	120	8.5
Burning	110	7.8
Inside the gutters	89	6.3
Burying them	8	0.6
On the roads	3	0.2
Inside undeveloped plots	1	0.1
No response	100	7.0
Total	1413	100.0

Vendors and LAWMA seem to be enjoying the confidence of our respondents in terms of refuse disposal, 48.6% dispose their refuse through vendors, while 20.9% do the same through LAWMA , refuse dumps 8.5%, burning 7.8% and inside the gutters 6.3%, while burying them and putting them on the roads .8%. The fact that inside gutters, burning, burying them and putting them on the roads got mentioned at all, as sites for refuse disposal suggests that there are serious problems. One can easily see the connection between poor refuse disposal methods and blockage drains and flooding.   The need for community's involvement, participation and ownership of garbage management can be seen here**.**

Table 5.3: Method of sewage disposal

Method of sewage disposal	Frequency	Percent
Water system	901	63.8
Pit toilet	393	27.8
Inside canal	36	2.5
Burying them	28	2.0
Inside gutters	22	1.6
Bush-undeveloped plots	2	0.1
No response	31	2.2
Total	1413	100

Water system is used by 63.8% of our respondents, followed by pit toilets 27.8 and inside the canal 2.5% This table is provided to allow us to see the relationship between sewage disposal and refuse disposal.

Major Findings

Sources of drinking water in the three communities include boreholes, public taps, water taps inside the houses, water vendors and streams in that order. Refuse disposal methods were through vendors carting away rubbish, LAWMA. Refuse dumps, dumping inside gutters, dumping inside bushes-undeveloped plots of lands, and burning by fire. Sewage disposal methods include water system, pit toilets, inside canals, burying them, inside gutters and bushes- undeveloped plots of lands.

Incorporation of Community Based Approach at the house hold level for garbage management and flood Control in Nigeria.

Constitutionally, household garbage/refuse issues lie within the purview of the LGAs but, these constitutional responsibilities have been usurped by the State. This has led to roles obligation confusion for both the LGAs and the State which has led to inefficient and ineffective garbage

collection in many cities in Nigeria. If the LGAs are too far from the household levels in terms of garbage collection and flood control, certainly the States are extremely distant and surely out of place to do anything meaningful on garbage management. Lagos city with the World Bank assistance has not worked very well because of the neglect of the human aspects of such as (behavioural, cultural and norms) of the project. The Community Based Approach (CBA) calls for collaboration with members drawn from various sectors at different levels- the State, the LGAs, and the community levels. The State will play the major policy and technical roles. The LGA which is the administrative head of the communities will have significant responsibility for health services in general and will play major role in the execution, implementation and coordination of the entire CBA. The Community members who are generating the garbage must be at the drivers' seat for getting rid of the garbage.

Expected responsibilities of the Communities
The multi-sectoral members at this level will include kings, chiefs, quarter chiefs or leaders, the Community Based Organizations (CBO) such as landlords, different types of artisan groups living as tenants, age grade associations, church groups, mosque groups etc. local banks, and other community associations such as traditional healers of various shapes. The institutional focus will be PHC facilities, which will serve as logistic and information centre for the entire activities. Each WARD must be mobilized, sensitized into forming Community Based Action Committee(CBAC) Note that this must be different from the political wing of the ruling party at the lowest level. The streets that make up each WARD must have a minimum of two member representatives, the total members in a setting must be 80% women and 20% men. On the WARD by WARD basis these people must be brought together for broad based orientation and simplified teaching using local dialects on Fundamental Human Rights, Democratic participation, Women empowerment, Environmental/Refuse management and Flood control methods. People must made aware of their obligations and responsibilities visa-vis welfare of the entire communities and environmental issues, After the orientation and training , each WARD should be made to have democratically elections where executive members such as Chairperson, Vice chair, Secretary, Financial Secretary, Treasurer and PRO will be elected for three years. Community members should be encouraged to invest in garbage collection by constructing carts and employing youths and able bodied people for continuous collection for pay thereby creating gainful employment for community members. Every community's household will have cards which will be unique and specific to each community for garbage collection and payment with the assistance of the local bank.

Modalities for collection should be simplified such that every household within a catchment area will actually be involved in the scheme. Functional maps of each ward must be drawn boldly and large enough as working tools. Their elected officers and the technical officers who must be qualified Public Health Inspector will ensure that their environments are kept clean. At this level there must be monthly meeting at the community hall or community school or a venue agreeable to all community members. At the meeting issues of garbage management and flood control must be exhaustively discussed. Local dialect must be medium of communication at this level, issues of sanction for erring community members also lies here. The lodgement of money collected at the local bank will be the responsibilities of the CBAC officers and Public Health Inspection officers posted to the WARD by the LGA.

Expected responsibilities of the Local Government Areas:
The multi-sectoral members at this level will include the department of Primary Health Care (PHC), Environment, Information, Education, Police, Community and Rural development, Social Welfare, Local heads and chiefs. The Medical officer for Health (MOH) or his/ her representative must be in charge of operations at this level. His or her team must include Environmental or Public Health Officers . Minimum of two public health officers must be assigned to each WARD for a

minimum stay of three years before they are transferred to another ward. With these officers standing by the community, the Executive Committee will be able to determine a trend regarding community awareness on squalor, filthiness and effective garbage management and flood control. This will make these environmental officers to be part and parcel of the community they are serving. The predatory perception and task force mentality existing between them and the community members will thus, be eliminated. These public health inspection officers with their technical know-how will maintain graphs on the boards in their various offices about each ward's level of performance. In WARDS where there are markets CABC should be set up along materials/commodities being sold. Markets are well organized in Nigerian cities, regular dues are paid for garbage collection, thus, CABC will bring efficiency and accountability to the process. A large market can have as many as five to ten CABC with their account in each bank but with fewer Public Health Inspection officers. In these large markets 2-6 public health officers supervising the environmental conditions and garbage management should be adequate. At this level, representatives of communities are brought up together for comparing notes and ideas such that best practices are encouraged. At this level, community members will start imbibing good behaviour regarding refuse disposal, after they have known their roles and obligations as a result, of continuous cultivation of the community members, it is only then that electronic media and radio/television jingle can reinforce positive behaviours. In fact, at this level electronic media, specifically television can be very useful and effective in covering and organizing the community meetings.

Expected Responsibilities of the State:

In 1975, during the implementation of the Basic Health Services Scheme (BHSS) the precursor of Primary Health Care (PHC) every State of the federation and those that were carved out of the existing ones, established Schools of Health Technology (SHT) where Public Health Inspection officers charged with maintenance of clean environment were usually trained. This category of health professionals are still being trained all over the nation with little or nothing to do even at the community level because of loss of vision on their parts and the part of Local and State governments. What the Public Health Inspectors are doing in most States of the federation is predatorily harass uninformed food sellers and vendors with a view to extort money from them, this they do once or twice a month from their officers at the LGAs. Some other times, they usually sit in the LGA secretariats jesting and talking or teaming up with the task force people to harass poor market sellers. They have no business sitting at the LGA secretariats but at the Community or household levels working with ordinary folks. They are begging to be fully utilized with proper schemes of service similar but much better than what they were doing during the colonial administration.

Their contemporaries in the advance countries are usually satisfied with cities and counties employment because the job security is sure and the pay is good and better State government.

The multi sectoral members at the State level will include all State ministries such as Health, Environment, Information (Radio and Television), Education, Agriculture, Women and Social Development and NGOs. The roles and responsibilities of the State include ensuring that garbage collectors get their rubbish deposited at the approved landfills or dumpsites with ease. Training of health professional such as environmental/ public health inspection officers, who will systematically deployed to the LGAs for onward transfer to the community and ward levels to ensure clean environments. Policies and regulation as well as research efforts should be encouraged for the effective management of refuse, with the results and outcomes of such, naturally filtering into the LGAs and community levels. For examples issues such as refuse derived fuel (RDF), methane gas for cooking and production can further be exploited at this level. In addition, the issue of recycling plastic/polythene materials, paper materials and biodegradable fertilizer industries will certainly lead to the emergence employment opportunities. There must be active collaboration between the State, LGAs and communities to work out pick up schedules that must be enforced by the State.

Conclusion

Refuse generation is an indispensable aspect of human activities in every society, and has to be continuously tackled. A systematic and simple but firm approach with deep community rooted life and driven is the only way out. The kernel of Community Based Approach (CBA) lies in the rearrangement of power blocks i.e sharing the power base of the elites with community members or locales. This called empowerment, not removal of the elites' power but sharing some with the community members. Public private sector participation at the community level seems the most realistic way to look for solution for many social problems bedevilling many developing societies. One needs to be reminded that all the advanced cities of the western world where Nigerian rulers run into at the slightest opportunity are kept running in clean and healthy condition as a result of the kind of "bottom up" approach which is being suggested in this paper. The cleaners in the advanced cities work at nights usually under the guides if the cities, counties and or towns which employ and pay them as well. The mounting garbage problem and seemingly intractable yearly flooding in many cities in Nigeria can be effectively managed and controlled if the policy makers are ready to be innovative by moving away from centralized management styles.

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Demographic transition and ageing population in Algeria

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Abstract

Given the rapid decline in fertility and decline in mortality at all ages, the proportion of elderly is increasing in Algeria. As a result of the rapid demographic transition, ageing population, which has already begun, will also be much faster in the coming decades. The percentage of population aged 60 and over in the total population will increase from 8% currently to 22% by 2050.This demographic change that is currently happening and is expected to accelerate in the future will inevitably have demographic, economic and social consequences and will affect family, society and state. This paper aims to analyze the causes and consequences of this demographic change as well as the new challenge of rapid ageing population that the country will have to face in the coming decades, particularly in health spending and pension system administration.

Keywords: Age structure, demographic transition, population ageing, retirement, Algeria, implications.

Introduction

The increase in the proportion of people aged 60 and over is unprecedented in the history of mankind. In many countries, it is increasing at a high rate than even before. Currently, the proportion of people aged 60 and over is estimated to be 10% of the world's population and will reach 22% in 2050.Two-thirds of this proportion live in developing countries. This increase in the proportion of the elderly is a result of a rapid demographic transition. It is particularly related to decline in fertility and to the increase in life expectancy as well as the overall improvement of the health conditions that have contributed to the increase in the proportion of elderly. There is no doubt that the ageing population is the most worrying phenomenon that human societies will face in the coming decades.

In Algeria, the ageing process appears much faster than that observed in other developed countries. It is the result of a rapid demographic, economic and social change. It is mainly due to the rapid decline in fertility and to the increase in life expectancy. Improvements in health and good living conditions, in general, which have led to improved life expectancy, have also contributed to the increase of the elderly population. Since independence, in 1962, the Algerian population has more than tripled from 12 million in 1962 to 18 million in 1978 and more than 37 million in 2012. During this same period, the age structure of the population has changed. While the number of elderly people is increasing, the number of young people is steadily declining. This increase in the proportion of older people is a consequence of the rapid demographic transition which is defined as the transition of a demographic regime characterized by high mortality and high fertility to a regime characterized by low mortality and low fertility. The most significant demographic fact, in Algeria, in the early 21st century is likely to be the ageing population. This continuous increase in the proportion of elderly has important implications such as the financial balance of the pension system and healthcare expenditures.

Materials and methods

The study is based mainly on the data of National Statistics Office, United Nations: data on world population ageing 1950-2050 and the national surveys conducted in 1970, 1986, 1995 and 2002.

Fertility transition

The main change in the evolution of fertility has been observed in four national population surveys: ENSP 1970 (period of high fertility: 8.1 children per woman), ENAF 1986 (time of onset of decline: 6.2 children per woman), PAPCHILD 1995 (acceleration of the process of decline: 4.0 children / woman and ENSF 2002 (confirming the downward trend continues, 2.3 children per woman), totaling a decrease of 72 % between 1970 and 2002. The decline is qualified as very fast and unexpected. In comparison, France took nearly 200 years to fall from 6 children per woman in the middle of the 18th century to nearly 2 children per woman in 1930. Algeria took only 35 years to reach this level. Table 1 shows the evolution of total fertility rate (TFR) which fell continuously from 8.1 in 1969 to 4.6 in 1990 and 2.3 in 2002.It is currently estimated to be 2.87.

A study done in 1986, which can be considered the entry into the second stage of the demographic transition, shows that fertility decline accelerated during the decade of 1990s and after. Family planning policy implemented since 1984 has played a major role in bringing down TFR. From 8 children per woman in 1969, this same index has decreased to 4 in 1992 and then to 2.3 in 2002, a real demographic revolution.

Table: (1) Changes in the total fertility rate of women aged 15-49 (Algeria 1969- 2011)

YEARS	TFR	YEARS	TFR
1969	8.1	1988	5.29
1977	7.4	1989	6.21
1980	7.1	1990	4.61
1981	6.95	1991	4.50
1982	6.40	1992	4.40
1983	6.37	1995	4.00
1984	6.26	1996	3.14
1985	6.24	1998	2.82
1986	6.20	2002	2.30
1987	5.29	2011	2.87

Sources: Inter-ministerial report on the program of control of population growth, Algiers 1983 - National Economic and Social Council (CNES): Study on population policy, Algiers 1996.CENEAP and ENSP 1970, EASME 1992, ENSF, 2002, NSO, 2004; 2012.

The decline that is currently affecting Algeria is so fast that the one can consider the third stage of demographic transition to be almost complete. The first decline during the last 30 years, mainly due to the decline in age at marriage was immediately followed by a second substantial decline. The second decline was due, this time, to a voluntary reduction in fertility of households. The main fertility decline that occurred in young women resulted from a deferred marriages and the entry into union of women is much later that they have experienced a prolonged schooling. But the education cannot be the sole explanation. Young women who have never attended school have also fewer children. If the decline in age at marriage remains the major factor in the decline of fertility in Algeria, it also remains that contraception has contributed to this decrease by the effective use of modern methods of contraception by the vast majority of women. However, the practice of contraception has gradually increased since 1962 with only 2% of the women using contraception to 36% in 1986 and to 60% in 2005. The significant increase in the average age at first marriage among women in rural areas and declining fertility concerned young illiterate women. Contraception does not appear today to be as exclusive as it once was or specifically used by urban or educated women: 44% of married women, rural or illiterate, have recourse (CNES, 1996, 38). Many researchers agree that contraception has reduced half the marital fertility, 77.9% in 2002 against 8% in 1970 (CNES; 2000). The total fertility rate (TFR) has declined significantly and it is expected to further decrease even though there is a cyclical increase, in recent years, qualified recovery after leaving the country the economic and security crisis lived in the 1990s.

Table: (2) Total fertility rate, Projection for the period 1990-2020 according to the assumptions, (low, medium and high).

Years	Low hypothesis	Medium hypothesis	High hypothesis
1990	4.77	4.77	4.77
1995	3.62	3.98	4.20
2000	2.88	3, 34	3.68
2005	2.47	2.84	3.70
2010	2.24	2.54	2.74
2015	2.22	2.34	2.59
2020	2.10	2.21	2.41

Source: National Economic and Social Council, 1997.

According to the most recent data, one could say that with a TFR of 2.3 children per woman, Algeria is close to completing its demographic transition that's steering it towards a

stationary state post-transitional. This is similar to other developed countries characterized by a level of a low fertility. This evolution of the TFR in Algeria has exceeded all projections made either by national or international organizations. The fertility decline continues, despite some increase in the birth rate following the improvement, economically and socially in the country in recent years. The decline is, in fact, irreversible. It is likely that the downward trend continues to achieve an even lower level under the combined effect of modernization and the Malthusianism which has won a part of the Algerian population. It is expected, therefore, in total, a further decline in fertility in the coming years, to an even lower level. Other factors play in favor of irreversibility. Female education is a viable component that can't be reversed and this will inevitably improve the social status of woman.

Mortality transition

At all ages, mortality has declined significantly. It is mainly exogenous causes that have been reduced. There is fight being waged against infectious and parasitic diseases with all effective means available today. In this overall decrease in mortality, the infant mortality has been decisive. From 170‰ in 1962, it has currently been reduced to nearly 25‰. Once infectious and parasitic diseases are brought under control and infant mortality is reduced, there will continue to be lower mortality rates through economic and health progress period. As a result, life expectancy at birth has increased significantly from 50.0 years in 1962 to 76.4 years in 2012. Despite the late entry in the process of the epidemiological transition, the life expectancy in Algeria is currently closer to that of developed countries.

Table (3) Changes in life expectancy at birth (years) Algeria 1970-2012

Years	Males	Females	Total
1970	52.6	52.8	52.6
1980	55.9	58.8	57.4
1985	62.7	64.2	63.6
1991	66.9	67.8	67.3
1996	66.8	68.4	67.7
1999	69.2	71.0	70.1
2002	72.9	74.4	73.4
2004	73.9	75.8	74.6
2006	74.7	76.8	75.7
2012	75.7	77.2	76.4

Source: National Statistics Office, 2005,2012.

In summary, the completion of the demographic transition and, in particular, the speed at which it is accomplished raises many questions. In the space of only 30 years, the demographic landscape has been changed: the fertility rate has been divided by 4, the age at marriage has increased greatly exceeding thirty years, the mortality rate has declined significantly and the life expectancy at birth continues to increase leading, in total, to considerable changes in the demographic structure of Algeria.

The ageing population

The ageing of the population and increase in the proportion of elderly in relation to the total population is considered an ageing from the base of the pyramid or from the top of the pyramid or a combination of these two demographic processes. The increase in life expectancy and the decline in fertility mean that greater ageing population is unavoidable.

Ageing from the bottom: (or base of the pyramid). Table (4) shows changes in the proportion of age structure over the course of 15 years which declined between 1975 and 2000 from 47.6% to

34.8% respectively. This decline in the proportion of less than 15 years has occurred in parallel with the decline in fertility that the TFR was divided by 4.Thus; the decline in fertility during the last 50 years has led to a significant reduction in the proportion of young people that moved gradually ageing at the base.

Ageing from the top: (of the pyramid). With the improvement of living conditions and healthcare, it is the second process of ageing that is more evident with the increase in life expectancy of persons aged 60 years and over. The ageing of the population, which is due to the fertility decline, will be amplified by the continued decline in mortality. The considerable progress in health registered in Algeria led to an increase in life expectancy which has reached a level closes to that of developed countries. From 50 years in 1962, it has increased to 76 years in 2012, a gain of 26 years over the considered period. This is the beginning of ageing at the top which will accelerate with continued improvements in health and longevity. Gains in life expectancy will benefit, increasingly, for the elderly with progress in the fight against mortality. And it is expected that the increase in life expectancy will also cover the higher ages that are situated beyond 75 years from 2030.

Transformation of the age structure

A change in the age structure shows that the age group (0-14 years) representing 47.6% of the population in 1975 is only 34.8% in 2000, which will reach 23.6% in 2025 and 19.7% in 2050. Age group (0-4years) decreased from 17% in 1987 to 11% in 2011 and will reach only 7% in 2020. (ONS 1999, 2010 and 2012).With the arrival of the next generations more and more numerous, the age group (15-59 years) estimated at 46% in 1975 rose to 59% in 2000.It will reach 65% in 2025 and will decline thereafter to 58 % in 2050. Demographic trends also highlight the trend of continuous increase in the relative importance of the older group (60+, 65+ and 80+) and at the same time decreases in the relative importance of the young persons. Population projections made by the United Nations until 2050 allow identifying the future trend of the population aged 60 and over, due only to demographic changes. In 2050, the population aged 60 and over will exceed that of the young by 2.5%, respectively 22.2% for (60+) and 19.7% for (0-4).

Table (4): Trend of the age structure (Algeria 1950-2050)

Indicators	Age	1950	1975	2000	2025	2050
Age Group (%)	0-14	40.1	47.6	34.8	23.6	19.7
	15-59	53.1	46.3	59.1	65.3	58.1
	60 +	6.8	6.1	6.0	11.1	22.2
Median Age		19.9	16.2	21.8	31.6	38.2
Dependency ratio		80.2	107.4	63.8	44.0	55.9

Source: Population Division, United Nations, 2001

From 5.7% in 1975, the proportion of persons who are aged 60 and over grew to 6.5% in 1998, 7.9% in 2011 (National Statistics Office, 2012) and it is projected to be 11% in 2025 and 22% in 2050. For example, France which reached 9.5% in 1940 took 60 years to reach 14%. Algeria will take only 15 years. The median age (the age which divides the population into two numerically equal parts: the younger half and the older half) which is currently 27 years old will increase to 31 in 2025 and 38 in 2050. The demographic problem will, therefore, arise, in the future, in new terms with the decline fertility and the change in the age structure of the population.

Table (5): Past trends and projected 60 years and over (%), Algeria 1950-2050

Indicators	Age	1950	1975	2000	2025	2050
Men	60 +	6.5	5.7	5.5	10.6	20.9
	65 +	4.2	3.8	3.7	6.5	14.8
	80 +	0.3	0.5	0.4	0.6	2.3
Women	60 +	7.1	6.5	6.6	11.7	23.6
	65 +	4.6	4.5	4.6	7.5	17.6
	80 +	0.4	0.7	0.7	1.1	4.0
Total	60 +	6.8	6.1	6.0	11.1	22.2
	65 +	4.4	4.2	4.1	7.0	16.2
	80 +	0.4	0.6	0.6	0.9	3.1

Source: United Nations, Population Division, 2001.

If the decline in the birth rate allows us to alleviate the weight of the young especially on the education system, it will inflate the number of adults and affect the ageing population. At the current rate of growth of the labor force (15-59 years), which is 3.5% per year, the major problem of the employment and unemployment still remains. The economic and social implications of the inevitable increase ageing of the population will be increasingly important. The burden will weigh increasingly heavy on the social security and pension system that is already facing substantial financial difficulties.

Figure 1: Changes in population Pyramids
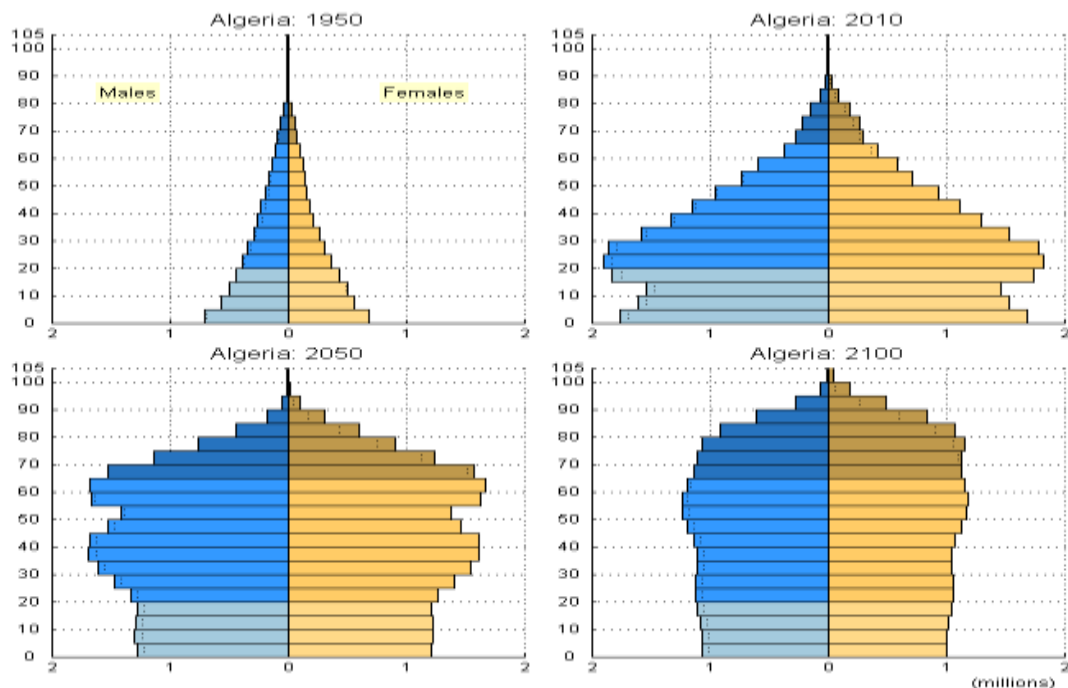
Source: United Nations, Department of Economic and Social Affairs, Population Division (2011): World Population Prospects: The 2010 Revision. New York.

The economic and social consequences of population ageing

In an ageing population, an important issue comes to the front, and that is the support the government must provide to the elderly population in terms of healthcare and pensions funding. In Algeria, the ageing which evolves at the rate of 3 to 4% per year determines the burden; the authorities have to shoulder to support this segment of the population.

The working-age population

Among the socio-economic implications of demographic change observed is, of course, the pressure exerted on the labor market. The labor force increases with an annual average growth rate of 3.5% more than the total population growth due to the arrival of generations that are more numerous on the labor market. The pressure on the labor market will increase with 280 000 new job applications per year that the Algerian economy is not able to absorb. This will result in a high unemployment rate (10.2% in 2011).

Table (6) Labor force and unemployment in Algeria, 1993- 2011 (in thousands)

Indicators	1993	1994	1995	1996	1997	2001	2010	2011
Working-age population	6561	6814	7446	7840	8069	9073	10812	11000
Unemployment rate (%)	23.25	24.36	26.99	27.99	29.2	27.3	11.3	10.2

Source: National Statistics Office: séries statistiques, 1999,2012.

Despite this evolution, the Algerian population is still young and the percentage of the labor force represents the most important. But we must recognize, in the context of demographic transition, the Government has not been able to exploit this demographic dynamic which represents an opportunity of the so called "demographic bonus", or the "window of opportunity" that boost the economic engine and to get an economic dynamism that is a generator of jobs and wealth creation. That said, the overall rate of activity will also depend on the participation of women, who represent 50% of the adult population. For the moment, the female employment rate still low (about 20%) and we do not know exactly at what pace it will increase. The evolution of women's work depends on other factors such as education, control of fertility, marital status and the number of conceived children etc... In all, if the current trend continues, labor force and unemployment could an important issue that the government must deal with.

The pension system

The financial balance of the pension system is generally presented as one of the areas particularly sensitive to demographic changes. The workers/ retirees ratio is an important part of the burden of pensioners. In 1988, there were 8 workers to support one pensioner. Today, this ratio is around 3 workers per pensioner. Different factors come into play. With the progressive ageing of the population, the number of pensioners is increasing and the workers/ retirees ratio also continues to deteriorate. Not only is the retired population continuing to increase (451,000 in 1986, 1.032 000 in 1998, 2.075 000 in 2009, 2.319531in 2012) but the working-age population that's responsible for feeding the pension fund is not keeping the pace adequately and sufficiently to follow or support the evolution of the projected numbers of retirees. It is also estimated that about 2.5 million people work in the informal sector and whose contribution to this funding is nonexistent at all. The doubling of the contribution from both the workers as well as that of the state to the public pension did not achieve, at the moment, the expected financial stability and balance for long term sustainability.

The inevitable ageing population could further aggravate the situation in the future with the continued increase in the number of pensioners. If the burden tends to decline, somewhat, for the school-age population, following the decline in fertility, it remains for the moment very important in comparison to that of pensioners. Nevertheless, the evolution of the older population will engender other problems that are related to health, building elderly facilities and health centers for the treatment of chronic diseases, nursing home etc..., for which Algeria is not yet well prepared. At present, there are no specialists in gerontology and there is a lack of geriatric services in hospitals and clinics throughout the country.

Having said this, the arrival at the age of retirement for many generations born in the last 30 years and which are little fecund makes it difficult to finance the pension fund in the future. They will have smaller pensions because there will not be enough assets to support larger pensions. The private sector pension could be proposed as a solution to the deficit of the public system but it was

refused by the General Union of Algerian Workers (GUAW) organization. The sustainability of the pension fund is ensured, at this time, by the annual allocation of 3% of the oil tax. And the ultimate question that many experts are asking is for how long can the state maintain this process?

Similarly, the current system of care and inadequate infrastructure to host the elderly is provided and supported by family solidarity. Yet, modernization and economic and social transformation have weakened traditional structures as well as a rise of individualism in the Algerian society. Today, there are more and more children who abandon their elderly parents in Algeria. To protect the older people, the Algerian Government has enacted a new law in 2010 (Official Journal 10/12/2010) requiring children to support their elderly parents and provide penalties for those who abandon their parents in retirement homes. But will this be enough and is this the right action? Certainly not with the continuing changes in values and cultural norms. According to the spokesman of the Ministry of Solidarity, 500 elderly were abandoned by their families in 2012 that the adopted law can't apply. It is believed that individualization movement will continue as well as the loosing of family ties. This means that rapid demographic ageing in Algeria remains to be a major challenge that the country will face in the coming decades.

Conclusion

Due to the rapid decline in total fertility rate and an increasing in life expectancy, Algeria will experience rapidly ageing population with a proportion of those aged 60 and above projected from 8% in 2012 to 22% in 2050. This ageing population already has a significant impact on the workers/retirees ratio as well as the funding of the public pension fund. With the completion of the demographic transition, there will be a reversal of the general problem of the relationship between population growth and economic growth. Algeria will have to solve the social and economic consequences of an ageing population. The cost of pensioners will certainly increase and the public pension system will be even more problematic if economic growth remains weak. The new demographic situation will worsen in the future and requires a reform of the pension system. The retirement age should be removed as has been demonstrated by the developed world's studies. The establishment of an adequate social policy is necessary to meet the new challenges of ageing population and all the mechanisms to improve the care of older people and their living conditions. The experience of the developed countries in this field can serve as a model and lessons that help a better care of the elderly in Algeria.

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Gendering Politics In Nigeria: Endangering The Female Homo Sapiens In A Corruption Ridden Society
Ommendations On Way Forward.

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Abstract

The major landmark of the Beijing conference is the sensitization of the women folk to seek a fair share of the national cake through then' increased involvement in political affairs not even minding the nature of 'polity'. Their 'commercial noise ' in the media has indeed created a loophole for their increased exploitation by the opposite sex who has en-robbed them in a garment of deceit through a few appointments in government, very many of which were given the legal backing meant to further entrenched the men at their detriment. Having played into the gallery though unknowingly, the female species may soon get to a cross-road where all form of dignity and respect accruing to them would be sacrificed all in the name of power and money. This paper takes a cursory look at this with a view to repositioning women in the scheme of things in this country. A representative sample of both sexes, from a cross-section of the population was taken for the research. Findings revealed the over-enthusiasm of the women folk and a lack of the adequate political knowledge required for their new task, warning them of the consequences of any sheepish role in a political game of winner, takes all. The paper made some recommendations on way forward.

Introduction

Decision making both in the home and in governmental affairs has always been viewed as the exclusive preserve of men. This has been strengthened by various societal policies many of which found solace in the biblical injunction instructing w'-omen to remain subordinated to their husbands. Stereotypic beliefs about women as the weaker sex with an inconsequential contribution to development, if any, has further clamped down on the productive activities of women. They are thus; not favoured on many policies relating to socio-economic and political issues for which men are believed to be key role players and indeed the real policy makers. Even where such policies remains silence on the degree of involvement of both sexes, the institution of the family rather assumes the little or no participation of the female gender thus subjecting them to spectators activities. Two areas where this appears glaringly visible is in education and political affairs.

Most traditional African societies hardly see any reason why the girl child should acquire western education. They are mostly considered as part of their husband's assets, and as such money should not be wasted on them. They are however socialized the African way to be passive, caring, submissive and highly active at domesticated jobs. Their male counterparts were also taught to be active, strong-willed, athletics, risk-takers;

and engaged in other activities depicting manhood. All of these were reinforced by the rich African folklores, riddles, literatures and cultural activities.

Female enrolment into schools at all levels has never matched that of their male counterparts. For instance, in 1995, female enrolment in primary schools was recorded as 47.8% while that of male was put at 52.2% (NEEDS bulletin 2006). A decrease was shockingly observed in female enrolment in 1999 with 45.9%, revealing a 1.9% decrease. At the same time, male enrolment shot up by 2% in 1999 over that of the 1995 data with 54.1% (NEEDS bulletin 2006)

The above, no doubt is bound to have a corresponding effect on female employment in the country, as well as their participation in decision-making. For instance, Krochex and Zanden (1999) recorded women participation at world level at 11.4% while in Nigeria, the Independent National Electoral Commission. (INEC) report shows that only about 10% and 15% women contested both the presidency and vice

presidency seats in 2003 and that 13.6% of ministerial seats were granted women while 27% were appointed permanent secretaries (inecnigeria. Org).

While this is a remarkable achievement over those of past years, it is still believed to have fallen short of expectation. This was held on to by some upper class women who erroneously believed that women population in comparison to that of men should be the sole criterion for appointments into positions, jettisoning professionalism and the actual female population in such establishments, While this argument may appear plausible anyway, it should also be pointed out that the damage caused women by our age-long archaic tradition and customs cannot be overcomed overnight by appointments of women into public offices whether or not they posses the requisites for such, for now. This however is not to intending a campaign of the traditional conception of housewifery for women but a gradual process of transformation of the female species in developmental activities.

Cultural practices across societies no doubt has further relegated the womenfolk in societal activities. This is seen in the non-recognition of women as of any greater economic value other than reproducers, baby producers and home managers. This is in spite of the fact that almost half of the world population were women (UNO:2000),

majority of whom (80%) were producers of foods sustaining even the men in some countries, even though they only have access to about 1% of world land (Omede 2004, UNO 2000).

Following the socialization of both sexes, boys were meant to follow such adventurous paths while girls were made to play second fiddle roles. This explains while such jobs as engineering and medicine were regarded as male profession while secretarial studies, and nursing were believed to have been specially designed for female, This fact was corroborated by the United Nations (1985) report that women filled about one-third 1/3%) of the labour force but performing menial jobs which attract low wages, compared to men.

It must however be noted that the traditional African societies accorded women their respects and distinguish place in the society. W^omen play vital role in the religious institutions to the extent that they have the final say on some occasions. Notable among some of those exalted positions are the 'Yeye Osun, the godess of the Osun river in one

of the Nigerian states which host millions of tourists yearly, the "eyesoun (kings wife) and the 'Erelu', who is a respectful decision maker in the 'Ogboni' secret society. The aforementioned has made many of our traditional women accepted the derigeur even to the extent of christening other women deviants campaigning against inequality of the sexes. Some of such name tags include 'Egbe ki loko o se (set of women that disregards their husbands). 'Oko kan o ka'gbon or lya ndagbe Baba nyowa and Dalemosu (all meaning; Divorcee or Independent or free hance prostitutes or worst still. Immoral women).

The above found solace in religious leaders and other women as very many of these women liberation fighters are either divorces, widows or separated from their husbands. Given the above, one would be less surprised knowing that women agitations were not given its deserved attention from the very beginning of their agitation. It was the regime of General Babangida that pushed the agitation higher with the establishment of the better life for Rural women by the them first lady; Mrs Mariam Babangida' Apparently she was the first to be addressed officially as the first lady while the husband was equally the first ever - known 'military - president' in the country. The corruption and deceit that became the characteristic feature of this administration could not make many believe in the mission of the first lady.

The global attention being given to women is a product of many years of agitation by women activities, who inspite of all odds protested the discrimination as well as the violence being faced by women. These group of women brought to the fore the second fiddle position of women in America as a form of discrimination and indeed deprivation. The convention of 1848 was aimed at addressing this and it recorded a little achievement of sensitizing government about the plight of women. This led to the establishment of the Women International Organisation by the League of Nations in 1919 (Omede 2004).

At the inception of the United Nation organization in 1945, the organisation was taken over with more attention given to it. The UNO economic survey revealed women as being terribly affected by the world poverty level. This led to the declaration in 1948 of the Universal right of women (Warren 1992), Following this was the 1975 women conference in Mexico which brought about among others, the institutionalization of an action plan for women (Pogosson 2004) with a major aim of reviewing the multiple roles

of the female gender in the society.   A major landmark of the conference is the declaration of the period between 1976-1985 as the decade for women.

The Copenhagen conference of 1980 which was intended to speed action on the major issues raised at mexico also recorded success by sensitizing government on the need to enact laws to protect the right of women as well as conduct research on the significant role of women, their labour force participation, their needs and the eradication of barriers against women as it relates to education and training, employment, and dad decision making (Pogosson, 2004).

The above was also improved upon at the 1985 Nairobi conference. Here emphasis was on how to improve women status by financing education to eradicate poverty of women and combating poverty to ensure equitable balance between both sexes (Pietilla and Vickers 1996). The Beijing conference of 1995 was no doubt the most remarkable of all the world conferences on women. Most countries including the third world countries attended and certain critical areas such as health and harmful practices against women, education, conflict, the issue of the girl-child, poverty and decision making were majorly addressed. The major concern were women about involvement in decision making at all levels as it is believed that, it is a major instrument of change. This was further buttressed by CEDPA (1997) and USAID (2002) that; -' *accessibility- of women to power would make them have a fair share of state 's resources and would also conscientize them of their rights".* Dahl (1976) had earlier maintained a similar opinion that 'polities' is all about who participates in decision making... If this assertion is true, then, one would not be surprise at the stand of women to be more active politically.

It was this, which spark off series of political activities of women across the globe. Nigerian women got reawakened especially after the Beijing conference. They have been more visible on the political terrain than before. According to Omede (2004), there appears a slight improvement in the political participation of women in 2003 over other past years. The 2007 elections equally shows greater improvement over that of 2003.   for the first time, Nigeria recorded the first female speaker of the second legislative house.   All these were made possible by the concerted effort of the government to raise the political awareness of women through; the establishment of the national policy on women with the intention of increasing women participation to 30% in

both the legislature and executive and secondly through the establishment by the Federal Ministry of Women and Youth Development (PMWAYD), of an action committee to mobilize women for the purpose of election. Aside from the above, the launching of 'Women money for women election' by some non-governmental organizations was meant to help women aspirants achieve their targeted objectives.

The problem with all these however is the heighten of women ambition to the extent of succumbing to the temptation to engage all forms of political chicanery to win election at all cost. Cases abound where women were unilaterally imposed by husbands on parties without contesting for elections. Where appointments are made. many women especially governors wives and mothers are believed to be more active as agents of looting of state treasury. This is gradually eroding the respect and the dignity of the womenfolk. According to Galligan (1998), 'Women are known to challenge inadequate and unjust public policies either imposed by culture or the constitution.

The question therefore is. If Nigerian women are active agents of corruption, where lies the fate of our democracy? It is against this background that the research address the following questions:

(a)   Should women be more active at the home font as mothers and home caretakers than in politics?

(b)   What category of women are mostly engaged in politics

(c)   Is partisan politics an avenue for women to correct the ills in the society[0]

(d)   How far can Nigerian women go in politics before loosing their self-respect?

(e)   What should be the acceptable minimal standard for women going into politics

(f)   What are the impediments towards the effective participation of women in politics?

(g)   In what other ways can Nigerian women contribute to societal development than politics

(h)   Is the political involvement of women in governmental affairs an escape from societal stereotypic beliefs, deprivation and violence on women?

Basic Aim and Objectives:

In the main, this study examines the behavioural consequences of the political ambitions and involvement of "Nigerian women in politics. From this major aim, the study seeks the following objectives:

(a)   Highlighting the important role of women at the home front as it affects their involvement in politics.

(b)   Knowing the category of women who are actively engaged in partisan politics and the place of the rural women in development^

(c)   Examining the impediments towards the effective participation of women in politics.

(d)   Identifying other useful areas where women can influence socio-economic activities to their advantage rather than concentrating efforts on politics

(e)   Pinpointing the various ways the female political elites have become mere

pawn in the political power game of winner takes all.

Methods

A representative sample of one thousand, four hundred and ninety three respondents of both sexes were involved in the research. The state was clustered into three senatorial districts. The three senatorial districts were further stratified before the respondents were finally randomly selected systematically. The study instrument was the questionnaire technique and it was administered to the respondents on the basis of sex, age and their degree of participation in politics. It contains four sections. Section one of the questionnaire elicited information on the respondents' background while the second part focuses on the assessment of women awareness of their rights. The third part assesses the important role of women in politics while the last section focus on factors enhancing the possible improvement of women status in societal affairs. The structured questionnaire contained 78 items in all, to which the respondents were requested to show their feelings. It was however complemented with the interview method. The data collected were analysed in simple percentages.

Data Analysis and Discussion

Findings from the survey revealed a proportional representation of both sexes with the female respondents representing 54.1% of the total sampled population while the male with a total population of 685 represents 45.9%. The problem of unreturned questionnaire accounts for the difference. The research also cut across various age groups within the research location. Those within the age group 31-40 years (25.9%) and those within the 41-50 years age group with 27.4% dominated the research. The plausible reason for this is that they formed the bulk of the economically active population, and they are mostly visible on the political scene, of many communities. Those below age 20 years are mostly youths in their teens and are still undergoing training. Majority of them are in schools hence their level of political involvement is low- compared

to the older and matured adults. They represents only 12.2% of the population next only to the age group between 21 and 30 years with about 259 (19.8%) respondents.

Findings equally revealed the presence of aliens (4,3%) participants in the research. The reason for this is to know the views of these people on female participation in politics. Their experience from at least two cultures, it is believed would go a long way to finding solutions to some of the issues raised in the research.

The bulk of the respondents are Nigerians drawn majorly from the three ethnic groups (see appendix 1) with the Yorubas in the majority with 861 respondents (57.7%) while the Igbos came next with eighteen percent (18.3%) respondents while the Hausa community were represented with 17% respondents.

The study also shows majority of our respondents having a good understanding of the issue being discussed. Over three quarter (3/4) respondent had at least secondary education. Close to 70% respondent had tertiary education. This fact is not surprising since the research was conducted in a literate population where nearly all family could boast of having produced a graduate. This again informed why civil servants were very many among the population. They represent 63.2% of the total sampled population. Trading forms another occupation for which the locality is just finding solace due to high level of unemployment. It is still represented by less than one-fifty (14.7%) of the population. It must however be noted that the Igbos are still dominating business activities in the state. The data on income is a reflection of this as majority of the respondents (34.3%) still earns very poor wages below N10,000 monthly. The minimum wage is still officially pegged below N10,000. Only a sizeable number of respondents 14.5% and 12.2% earns between twenty one and forty thousand naira. Only one-tenth 10.2% earns close to N50,000 and about that proportion (8%) earns above N50,000. The implication of this is that majority of the working population would be engaged in other jobs to compliment their earnings. This probably explains why very many are involved in politics as an alternative means of sustenance survival.

Another revelation worthy of note is Marital status. About one-quarter percent of the population are either divorce or separated (25.1%) while closer to 30% were still single as at the period of the research. This may have implication for our politics as these categories of people are likely to feature prominently in the politics of the state as they have little difficulty attending party meetings. This again explains the vulgar language given to some of the women in politics by the more religious inclined and other traditional people. The Christians, it must be noted dominated the area with 72% of the population while their Muslim counterpart represents only about one-fifth (21.1%) of the population.

The second part of the research assessed the awareness of women about societal perception of the female gender. Findings from the field survey equally revealed that women were not still believed to be having equal position in societal decision making as they are only seen as supporters and not men's equal. An overwhelming majority (73.9%) of the respondents held this opinion while only about one-fifty (21.8) were of the contrary view. The conception of the women as being naturally created for reproduction, and child rearing still hold among the Ekiti - Yorubas as well above half (54%) of the respondents affirmed this but it was vociferously rejected that the place of the woman is in the home. A significant proportion of the respondents (76%) attested to this. This findings appear running contrary to the perception of the woman as her husbands supporter and not her equal; but while it is believed that they (women) can feature in societal affairs, it should be only to support the men and not to stand on equal pedestal. This was further buttressed in the question on whether women involvement in waged employment is to compliment husbands efforts in the home, to which about half (49%) of the respondents consented.

Findings also revealed the traditional conception of man as the head of his household who has the exclusive power to make decision on matters as it affects the home. 81% of the respondents

held this view while less than one-fifth (16.3) disagreed. African tradition, it was also revealed played a significant role in the subjugation of the womenfolk. The question on widowhood practice as harmful to women with 74,3% in agreement and that on African tradition excluding the women from inheriting part of her family's assets to which over 42% equally gave a positive response supports this assertion. This corroborated Poggosson (2004) and Omede (2004) earlier submission that women were simply considered as only useful performing the triple jobs of reproduction, child-rearing and caretakers.

On the role of women in politics, it was revealed through the survey that the low-education of many women has been a major hindrance to their active participation either at home or in governance, Women by virtue of their acquired skill earn low wages which is also a reflection of their low job status. With equal degree both men and women are believed to be treated equally in the public service. About eighty percent (79.4%) respondents agreed to this fact although it was equally agreed that many private establishments would rather employ men than women. Where women are considered for employment, it is sometimes done with the agreement that they would remain unmarried within their first few years in service. This is probably to avoid wasting resources on the series of leave such as maternity leave for which the women have be allowed under the law.

It was equally revealed that most women taking active part in politics are either single mothers, divorcees or at least separated from their husbands. 43.4% respondents agreed to this view while about half of the respondents vehemently opposed this view. This explains why the entrance of women into politics was initially seen at an aberration. Not less than 71% attested to this while about 28% disagreed.

The survey also pinpointed various reasons why women may not be equal match with the men in the game of politics, one of such is the fact that women politicians are considered greedy who only see politics as avenue for making money. 41.5% respondents agreed to this while well above half of them (58%) disagreed to this assertion but it was upheld generally that young ladies aspiring political positions are prostitutes who only see it as an avenue to commercialize the sex trade. 67.2% respondents attested to this while only about one-third held the opposing view. Another impediment to the effective participation of women in politics is that they were ill-trained for it. Very many lacked the ability to compete financially, educationally and experience wise compared with the men to partake in political activities, (see appendix III), This again supports Omede (2004) earlier findings that many women cannot rival their male counterpart in politics on ground of money. This argument appears cogent for the launching of women money for women election 'by a group of Non-governmental Organisations (NGO) as part of the agenda 2003 (Omede 2004). Sklar (1983) also came out with similar findings when he reported that monetization of politics coupled with bribery and corruption are major impediments of women towards political participation.

On whether their (women) involvement in politics could change things for the better in the country, opinion varied as about 60% respondents reported that nothing substantial could be pointed as major women politicians contribution to development. This was according to an interviewer was anchored on the fact that no legislation was moved or even emanated from most women in the legislative houses across the country. He says:

> // /.v doubtful if any good can come front these women who found themselves in shoes that doesn't '1. fit them, simply because their husbands fathers wields a lot of influence in their parties... only a few of them who are appointees of government based on their personal credentials could he said to actually merit their position - (A retired school principal, 60 yrs old).

Of course, this position was vociferously rejected by not less than 40% respondents while only two percent maintained a neutral position. Question posed on the position of first lady position also generated similar argument as majority respondents (78.2%) equally see it as an avenue for

personal aggradisement and looting of state treasury by both husbands and wife entrusted with the administration of state. Another 73% respondents even affirmed that the artificial creation of that exalted position has no constitutional backing and hence it is an aberration.

On the corrupt activities of politician generally, it was revealed through our survey that women politicians are equally as corrupt as their male counterparts. 57.2% were in support of this position leaving 41.5% with a dissenting view. Another interviewer corroborated this thus:

The issue of corruption of female politicians should not he over flogged; or how would you explain the acquisition of 12 luxury cars h\ the speaker of the house of representative and even accepting such amount as N628milhon being approved only for renovation of her official quarters.... (Male, civil servant, 52years old).

Commenting on the politics of thurgry as an activity for which even women are becoming better known than men, it was agreed to by 56.7% respondents that women just like men are involved (See appendix III). Another interviewer commented on this thus;

Just take the case of one Mrs. 'X; ' you know whom I am talking about'.^ who was imposed by her husband on the people in her constituency to stand for election she never contested just because of their power within the party and she shamelessly accepted... even went as far as challenging her defeat at the tribunal when the community rejected her... what a shame... please don 7 quote me oh.

(Woman, 43 year community leader and mother of three)

Of course, the issue being refereed to here has been celebrated by one of the Nigerian weekly magazines - The News Magazines while commenting on the fraudulent practices of the ruling party during the last election. It was however suggested that education of female children if made a must would go a long way at correcting the imbalance between the sexes in no distant future. This receives an overwhelming support of the respondents with close to eighty percent (79.2%).

It was also consented to by over four-fifth (81.1%) of the respondents that the issue of child labour should be taken more seriously. Infact not fewer than 81.5% agreed that it should carry very stiff penalties such as capital punishment. While Nigeria population posses no serious threat given our human and natural resources, it is still suggested that registration of all births should be monitored and recorded for proper planning. About two third respondents (67.8) were of the view that it should be made compulsory irrespective of the place of birth or circumstances surrounding such births.

While a reasonable proportion of the respondents (52.2%) wants cultural beliefs regarding a women as part of her husbands assets to be disregarded, another 57.7% respondents were of the opinion that the girl child should be given orientation which would be aimed at making them see themselves as equally endowed like men. About two-third (63.3%) equally agreed that sexual segregation in schools as well as in occupations should be discouraged (see appendix iv)

CONCLUSION

The struggle for the emancipation of women and their involvement in governmental activities has gone global. It could be said that the women has crossed the rubicon and there is no going back on this but, this paper suggests that, women as mother of the nation should tread with care as current events in the country is pointing accusing fingers to women-as aiding and abetting corruption and of forms of electoral fraud. It is therefore suggested the proper scrutiny of any woman seeking political

positions. This could better be done by women agencies themselves so as to give the conviction that they actually meant business and can live up to expectation.

It is believed that women leaders should demonstrate commitment to democratic values by taking stand against all anti-democratic values and policies as it is through this that they can help safeguard our nascent democracy. Non-governmental organizations should develop schemes to boost institutional skill upgrading among older illiterate and poor and unemployed women. This would go a long way to bridge the gap between the rural poor and urban rich women, hence stopping the polarization between these two categories of women.

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APPENDIX 1

SECTION A

Socio-Economic Characteristics of Responsibility of The Respondents

		N	%
SEX	Male	685	45.9
	Female	808	54.1
Age	Below 20 yrs	182	12.2
	21 -30yrs	296	19.8
	31 - 40yrs	387	25.9
	41 -50yrs	410	27.4
	50 yrs	218	14.6
Nationality	Nigerian	1,429	95.7
	Foreigner (specify)	64	4.3
Ethnicity	Yoruba	861	57,7
	Igbo	273	]0 n .
	Hausa	254	17.0
	Others (specify)	105	7.0
Educational Level	No formal Education	048	3.2
	Only primary school	125	8.4
	Secondary school	216	14.5
	Tertiary institution	1,023	68.5
	Other vocational school	81	5.4
Occupation	Trading	220	14.7
	Farming	044	2.9
	Civil servant	944	63.2
	Artisan	079	5,1
	Proprietor/Businessmen/women	206	13.8
Job status	Junior	403	26.9
	Middle	315	21.0
	Senior	226	15.1
Income (Monthly)	Below N10,000	512	34.3
	N10,001-N20,000	310	20,8
	N20001-N30,000	217	14.5
	N30001-N40,000	182	12.2
	N40001-N50.000	152	10.2
	N50.000+	120	8.0
Marital status	Single	420	28.1
	Married	698	46.8
	Separated/Divorce	375	25.1

Religion	Christianity	1,076	72.0
	Islamic	315	21.1
	Traditional	068	4.6
	Free thinker (others)	034	2.3
Family structure	Monogamy	410	27.5
	Polygynous	663	44,4 ^
Number of children	None	03	02
	1 -2	21	1,4
	2-4	504	33.8
	4-6	410	27.5
	6+	118	7.9

Note that figures may not add up to 100 because of rounding

APPENDIX II

Section B: Measures for Assessing Awareness of Women Rights And Subjugation

	N = 1443		
	Agreed	Disagree	Neutral
Societal perception of women in that of a supporter and not her husband's equal	1103	325	065
	(73.9)	(21.8)	(4.4)
Women are mostly engaged in reproduction, child bearing and other domestic activities	815 (54.6	611 (40.9	067 4.5)
The place of a woman naturally is in the home	314 (21.0)	1134 (76.0)	45 (3.0)
Women are engaged in waged labour to augment husband's efforts/salary	732 (49.0)	752 (50.4)	09 (0.6)
Our tradition support/encourages the training/education of male than female children	1022 (68.5)	445 29.8)	26 (1.7)
	N= 1493		
Women by tradition are considered as part of their husband's goods	833 (55.8)	611 (41.0)	49 (3.3) (J.J)
Women are excluded from inventing part other family's assets	640 (42.9)	817 (54,7)	36 (24.2)

By tradition, decision making even in the home is considered an exclusive preservation of the men	1,210 (81.0)	243 (16.3)	040 (2.7)
The dual role of women both at home and the world of work affects them negatively	732 (49.0)	718 (48,1)	43 (2.9)
The subjugation of the womenfolk is supported and reinforced by religious indoctrination	819 (54.9)	639 (42.8)	35 (2.3)
Developmentally, the girl-child is not brought up to learn skills (i.e. Medicine, Engineering etc) considered predominantly men's occupations	723 (48.2)	766 (51.3)	07 (0.5)
In politics, women have suffered set-backs by their exclusion from participation in politics	933 (62.5)	540 (36.2)	20 (1.3)
Widowhood practices demean the status of women in the society	1110 (74.3)	351 (23.5)	32 (2.1)
	N- 1493		
Professions such as teaching, nursing and secretariat studies are considered as women occupations	914 (61.2)	568 (38.0)	11 (0,7)
Women go into teaching, nursing and secretariat administration because they afford them the opportunities of having enough time to take care of the home	336 (22.5	1,128 (75.6)	29 (1.9)
The involvement of women in paid employment is to supplement/complement the efforts of their husbands at the home front	741 (49.6)	738 (49.4)	14 (0.9)
In view of women dual role, women in paid employment should not be made to work same hours with their male counterparts	693 (46.4)	764 (51.1)	36 (2.4)
The nature of women (passive, dependent etc) does not offer them the best opportunity to partake in politics as their male counterpart	1,012 (67.8)	476 31.9)	05 (0.3)

APPENDIX III

Section C: Measures for Assessing Women Education And Role In Politics

	N -= 1,493		
Most African traditional societies still consider the issue of girl's education as mere waste of time and resources	457 (30.6)	1011 (67.7)	25 (1.7)
The education/skills acquired by women earn then low income jobs	1225 (82.0)	241 (16.1)	27 (1,8)
	N = 1144		
Women of the same degree and qualifications as men are still treated unequally in public service	908 (79.4)	172 (15.0)	64 (5.6)
	N= 1456		
Some private firms do not allow women (married) going on maternity leave	784 (53.8	596 (40.9)	76 (5.2)
	N = 1456		
As part of the conditions of service, marriageable ladies are made to take oath not to marry within their first three years in some private firms	725 (49.8)	688 (47.3)	43 (3.0)
	N=846		
Women are mostly employed in very many firms/establishment as receptionist/clerks/cleaners and office helps.	413 (48,8)	399 (47.1)	34 (4.0
	N = 710		
The entrance of women into politics was initially frown at by the society as they see it as an aberration	540 (71.0)	202 (28.5)	04 (0.5)
	N= 1,264		
Decision making as it affects both sexes in African traditional societies is the exclusive preservation of the male gender	963 (76.2)	294 (23.3)	07 (0.5)
	N= 1,264		
Women are required by our tradition to be obedient and totally submissive to their husbands	1,214 (96.0)	017 (1.3)	33 (2.6)
	N1,264		
While men in some traditions are allowed to go into concubinage, it is a taboo for women	1,040 (82.3)	180 (14.2)	44 (3.5)
	N=310		
polygymy in most societies where practiced is a major weapon of repression/check women excesses in the family	1,135 (86.6)	166 . (12.7)	09 (0.7)
	N =1,008		

Most women in politics are either single mothers, divorcees or separated from their husbands	437 (43.4)	562 (55.8)	09 (0.9)
	N = 1493		
In politics, women cannot aspire top positions because they lack the financial and educational wherewithal to compete favourably with their male counterpart	1,110 (74.3)	380 (25.5)	03 (0.2)
One obstacle to women effective participation in politics is their inability to attend nocturnal meetings	1,130 (75.7)	360 (24.1)	03 (0.2)
Various religious doctrines also act as banes towards the effective participation of women in politics	1,210 (81.0)	280 (18.8)	03 (0.2)
Women party cannot strive because naturally, they (women tend to value husbands/parents party affiliations than women political parties	1,217 (81.5)	273 (18.3)	03 (0.2)
Young girls/ladies' in politics are regarded as prostitutes who are only commercializing their sex trade	1,004 (67.2)	48.5 (32.5)	04 (0.3)
Greedy women who only see politics as an avenue to better their lots are mostly political leaders in this part of the world	620 (41.5)	866 (58.0)	07 (0.5)
Many women in governance have been initiated to know party tricks of lying, gerrymandering, thugry and deceit	851 (56.9)	602 (40.3)	30 (2.0)
Not much could be pointed to as women contribution to the political development of the country	605 (40.5)	870 (58.3)	18 (1,2)
Engaging women in politics is an unnecessary dissipation of energy from the mainstream of economic activities	720 (48.2)	751 (50.3)	22 (1.5)
	N = 1,206		
The position of the first lady has no constitutional backing Nigeria (i.e. Not entrenched in the country's constitution)	942 (78.1)	252 (20.9)	12 (1.0)
	N - 1206		
The office of the first lady is only an avenue to further deceive the women of their involvement in politics	518 (43.0)	964 (80.0)	11 (0.9)
	N= 1206		
It is only an avenue for personal aggrandizement/looting of	943	250 13	

state/nations treasury by the men in power	(78.2)	(20.7)	(1.1)
Women trade unions/associations would protect the rights of women better than their individual political affiliations	680 (56,4)	524 (43.4)	02 (0.2)

Women politicians are equally as corrupt as their male counterparts	690 (57.2)	501 (41.5)	15 (1.2)
The office of first ladies has no direct positive impact on the society	742 (61.5)	453 (37.6)	11 (0.9)
Funding of this office are made through compulsory generous donations from other political appointees of government/government contractors/favour seekers	816 (67.7)	377 (31.3)	13 (1,1)
There is no continuity in the programmes of this office once their husbands are out of power	821 (68.1)	369 (30.6)	16 (1.3)
Every first lady pursues programmes of interest to her or programmes that she thinks would benefit her mostly	905 (75.0)	294 (24.4)	*07* (0.6)
People make donations mostly for fear of being sanctioned by the power that be	896 (74.3)	301 (25,0)	09 (0.7)
The artificial position of first ladies has introduced our women to corruption more than ever before	822 (68.2)	369 (30.6)	15 (1.2)
The account of most if not all of these offices across the nation has ever remained un-audited	827 (68.6)	361 (30.0)	18 (1.5)
The first ladies are, not accountable to anybody or governmental organ for the activities of their offices	915 (75.9)	265 (22.2	23 (1.9)
Most often than not this position is a usurpation of the role/power of the ministry of youths, sports and culture and that of women affairs	944 (78.3)	248 (20.6)	14 (1.2)
The creation of this office only helps in getting jobs for the women opportunists and fortune seekers in government	680 (56.4)	511 (42.4)	15 (1.2)
It is only but a means of extending the fair share of the national cake to vocal women, who are seen as mere tools/pawn in the game of politics	604 (50.1)	593 (49.2)	*\09|* (0.7)
It is in short an avenue for wastage of both human and material resources as it has impact on them negatively, mostly by exposing them to electoral fraud, political Gerry mandering, thugry and assassinations and politics of winners take all.	811 (67.2)	370 (30.7)	25 (2.1)

APPENDIX IV:

Measures for Assessing Factors Enhancing Possible Improvement of Women Status in the Society

	N = 1.493		
Education at all levels should be made free and compulsory for all (both sexes) in all parts of the country	1182 (79.2)	296 (19.8)	15 (1.0)
Child labour should be viewed as a criminal act in Nigeria and should carry very stiff penalties	1,210 (81.1)	274 (18.4)	09 (0.6)
Women/Children trafficking should equally be treated as crimes carrying capital punishments	1,217 (81.1)	265 (17.7)	11 (0.7)
Registration of birth should be made compulsory for all parents irrespective of place of birth and/or circumstances surrounding such births	1,012 (67.8)	478 (32.0)	03 (0.2)
Cultures stereotyping woman/girls as their husband property should be discountenance with	779 (52.2)	695 (46.6)	19 (1.3)
The girl-child and women should be given orientation which would make them see themselves as equal partners to men.	862 (57.7)	622 (41.7)	09 (0.6)
Sexual segregation in schools as well as in occupations should be discouraged	945 (63.3)	527 (35.3)	21 (1.4)
Religious doctrines playing or apt to play predictive value in the subjugation of the women folk should be played down upon/relaxed	887 (594)	601 (40.3)	05 (0.3)
Government should enforce laws against discrimination of women in the world of work (such as laws on maternity leave, etc)	933 (62.5)	555 (37.2)	07 (0.5)
Government should provide adequate funding for women going into politics so as to make them participate equally as men	713 (47.8)	758 (50.8)	22 (1.5)
Appointment of women into political positions should always be on merit, not on quota system or whom you know or ethnic affiliations	769 (51.5)	703 (47.1)	21 (1.4)
There is the need for awareness campaigns on the rights of women as well as their importance as active agents of development	725 (48.6)	753 (50.4)	15 (1.0)
Women associations acting as women organs should be seen acting as watchdogs of women in public offices rather than mere agitating for positions in government	940 (63.0)	539 (36.1)	14 (0,9)
Women trade association should be assisted in their lucrative businesses to make their living standard improved	1,021 (68.4)	446 (29.9)	26 (1.7)

Every individual women going into politics should be rigorously screened to make them realize the sensitive nature of their role.	1236 (82.8)	239 (16.0)	1 8 (1.2)
Any artificial position so created to silence women agitators should be scrapped	1.124 (75.3)	348 (23.3)	21 (1.4)
The position of the first lady should not only be backed by law, it should also be statutorily empowered with a clearly defined role	1,302 (87.2)	187 (12.5)	04 (0.3)
There should be equal opportunities for advancement for both sexes both in private and public sectors of the economy.	1,314 (88.0)	160 (10.7)	19 (1.3)
Women leaders especially in position of power should be seen as having focus, not as mere pawns in the hand of men.	1,406 (94.2)	069 (4.6)	18 (1.2)
Regardless of party affiliations, women leaders/associations should demonstrate commitment to democracy by taking a stand against all anti-democratic policies/tendencies	1,412 (64.6)	63 (4.2)	18 (1.2)

Nutritional and Health Measures for Promoting Positive Ageing in Nigeria

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Abstract

Ageing is a unique and natural process. It is a process that cannot be stopped. Ageing starts at conception and stops at death. The rate at which the ageing process progresses varies in individuals. Ageing produces observable changes in structure and functions of the body. Positive ageing is a process of getting older gradually and in good health. It involves being actively healthy as one's age increases. The study aimed at identifying the nutritional and health measures for promoting positive ageing in Nigeria. The population for the study was made up of medical doctors, nurses, Nutritionists, Home Economics teachers/lecturers and post graduate students from universities in Southern Nigeria. A sample of 125 persons was randomly selected for the study. A 4-point scale questionnaire was used for data collection. The percentage, mean, standard deviation, variance of the mean responses to the items were calculated. T- test was used for testing for differences between the mean responses. Results revealed that the nutritional and health measures for promoting positive ageing are as follows: eating of balanced diet, judicious consumption of fresh fruits and leafy vegetables, avoidance of alcoholism, giving of Nutrition Education at early age to old age. Including rest periods as one works, determination to keep one's self healthy, prevention of diseases, application of hygiene principles and Health Education. There were some significant differences in the responses of the nutritionists and the medical doctors on the measures for promoting positive ageing. It was recommended amongst others that people should be given Nutrition and Health Education right from early age.

Key words: Positive ageing, actively healthy, Nutrition Education, Health Education.

Introduction

Everyone is increasing in age as the days pass bye. Thus ageing is an inevitable process. However, the rate of ageing varies from one individual to another. Certain factors could be responsible for this, such as type of feeding, nature of work done, residence and other environmental factors.

Ageing produces observable changes in structure and function of the body and increases vulnerability to environmental stress and diseases (Totora and Grashowski, 1996). They described biological ageing as including all the normal, progressive, irreversible changes to one's body that begin at birth and continue until death.

Ageing is a natural process, hence there is need to change attitude towards it. WHO (2002), Nelson (2005) stressed the need for a change of attitude from a pessimistic view that equates ageing with ill health and increasing financial burden on the welfare state to a focus on active ageing.

Healthy ageing is being healthy, lively as one grows older. There are certain factors that can hinder healthy active ageing. Some of such factors are poverty, malnutrition and ignorance of how to maintain good health. The World Bank (1993) reported that a third part of the world population is poor, hungry and malnourished primarily among these are the underprivileged peri-urban communities. The major causes of malnutrition are poverty. Poverty according to WHO (1994) has its destructive effects at every stage of human life. It constitutes the world's deadliest cause of disease, suffering and death. Malnutrition predisposes one to chronic diseases and stroke in later life (Scrimshaw, 1997, Ashworth, 1998).

Inadequate intake of food results in malnutrition (under nutrition). Malnutrition has a very complex etiology. It is related not only to the quality and quantity of food but also to unsatisfactory physical and psychological environment, poverty, infection, ignorance and lack of adequate medical care (Nnayelugo 1992). They outlined some of the adverse effects of malnutrition and its various manifestations to include low productivity, low resistance to diseases, nutritional deficiency diseases, high morbidity and mortality rates. In addition, Ega and Almustapha (1996) stated that malnutrition leads to functional impairments in terms of cognitive development, educational performance, impaired work capacity and productivity.

It is expected that as one ages, retirement period comes. Insel and Roth (2004) noted that retirement marks a major change in the second half of life. It is usually accompanied by new economic status, severely restricted budget or even financial disaster if one does not plan ahead. Nwagu and Okafor (2008) stated that planning ahead for retirement is even very crucial because of the policy by the Federal Government of Nigeria so the individuals will be more able to sustain their income, achieve self fulfilment and ego when they remain active at old age.

Active ageing involves being strong, healthy, active independent and happy even as one gets older in age. Kalache (1999) views active ageing as the process of optimizing opportunities for physical/social and well being throughout the life course in order to extend healthy life expectancy.

Much attention is being drawn to active ageing due to the present projection of population ageing. The global phenomenon of population ageing is very apparent. According to WHO (1997), population ageing is the term used to describe the new configuration of the world's population in which the elderly individuals constitute larger percentage of the population both in developed and developing world. Okafor (2001) attributed population ageing to fertility and mortality. He noted that few children are born and many people get to old age. Nwabueze in addition attributed population ageing to improved nutrition, declining infection, better standard of living, prospect in education, health care and biomedical technology.

The need to promote active ageing can not be over-emphasized. In this vein, WHO (1997) pointed out the key to promoting active ageing are as follows- physical, social, mental, emotional activity, prevention of diseases, disabilities and a positive attitude towards ageing. In addition Nwagu

and Okafor emphasized that old people need to be active in order to be physically, mentally and socially fit and condemned the act of people retiring to go back home to become idle. They stated that the value of work is not just in the physical cash that it generates but that productivity itself is a natural and intrinsic demand for self fulfilment and self satisfaction for man. In support of this view, Gatz (2004) stressed the need to keep working in order to keep the muscles, heart, lungs, and other organs of the body working. Insel and Roth (2004) revealed that human beings jeopardize their health through inactivity and thus encouraging the muscles and even the brain to wither and deteriorate. The more active older people are, the healthier they become (Papiia and Wendkos 1992). Nwagu and Okafor (2008)) stated that elderly people should be encouraged to maintain an active life style through the following activities: regular exercise, shopping, attending meeting and occasions, visiting, telephoning, writing letters to friends, engaging in church activities, reading of newspapers, sewing, gardening, painting, sculpting, and walking as they are able. Bettes (1997) revealed that with regard to adaptability, elderly people have many latent and dormant reserves that are not used simply because they are not activated by environmental demands. He noted the accumulation of such reserve starts at birth and continues throughout life. It was concluded that many old people tend to live in an understanding environment with little stimulation whereas mental demands can have the effect of activating these latent reserves.

In order to maintain good health and to promote healthy ageing good health status, people should avoid negative risk factors such as smoking. Swanbory and Selke (1993) referred to the avoidance of negative risk factor such as smoking and alcohol abuse. Nwagwu and Okafor (2008) stated that smoking and alcoholism are inimical to optimal health and should be avoided. WHO (1993) stated that health promotion and disease prevention are necessary. It was also stated that good health and well-being are vital for continued productivity and independence.

In an attempt to improve nutrition and health, there is now a shift in attention to technology that are more accessible to the poor families and that can be used to prepare adequate food for all groups based on locally available foods that would not demand maximum additional cost and time (Tomkins et al, 1994).

Good health is fundamental if personal and national developments are to be attained. Good health is often regarded as wealth. An individual who is healthy can go a long way to maximize his potentials and achieve his goals for life. On the other hand, an individual who can not meet his nutritional and health needs is highly incapacitated. His level of productivity will be highly hindered. Imonikebe (2009) recommended the need for Health Education for maintaining good health for self and for national development. She stated that it is only those with good health status that can develop themselves and others.

WHO (1994) suggested the incorporation of the followings: Financial support subsidized food, transport, healthcare, family care and daycare centres as ways to help elderly people to remain active.

The number of people aged 60 years and above is increasing all over the world. As such, WHO (1997) projected that by the year 2020, more than 1000 million of the people in the world will be over 60 years and that two third will be living in developing countries. If one puts into consideration that there is a steady increase in number of children and adults there is need for much concern for those who are above 60 years of age. Necessary plans need to be put in place to ensure that these people have comfortable healthy active ageing, independent retirement old age period. Certain measures need to be put in place to ensure that the ageing population does not suffer neglect and also the young population is not over burdened by old people. Hence enhancement and fruitful active healthy ageing measures need to be devised and implemented. This is the thrust of this study.

Purpose of the Study: This study aimed at investigating into the measures that can be used to promote active healthy ageing in Nigeria.

The specific objectives of the study are to:

1. Find out the factors that hinder active healthy ageing in Nigeria

2. Identify the measures that can promote active healthy ageing in Nigeria

3. Identify the benefits of active ageing.

Hypothesis

HO_1: There will be no significant differences between the mean responses of those in the medical field (Doctors and Nurses) and the Nutritionists/Home Economists) on the measures for promoting active healthy ageing in Nigeria at 0.05 level of significance and 45 degrees of freedom.

Methodology

Design of the study: The study was a survey research meant to identify the hindrances and enhancement strategies for promoting active healthy ageing and the benefits in Nigeria.

Population Sample: The Population of the study comprised of nurses, doctors, Home Economists, Nutritionists, (lecturers, teachers and students) from five states: Delta, Oshun, Imo, Ekiti and Lagos State.

The Nutritionists and Home Economists are University lecturers and students. The teachers are degree holders and teach Home Economics in Secondary Schools. A random sample of 125 persons was obtained. This comprised of ten doctors, 21 were nurses and 20 were lecturers. Twenty-three teachers and 51 were post- graduate students. Twenty-five persons were randomly selected from each of the five states.

Instrument: Questionnaire was the instrument used for data collection. Section A was on the demographic information about the respondents. Section B was on the hindrances to active healthy ageing, Section C was on the strategies for promoting active healthy ageing. Section D was on the benefits of active healthy ageing.

Method of Data Collection: The copies of the questionnaire were administered to the respondents by the help of research assistants. After completion, the copies of the questionnaire were immediately retrieved. One hundred and twenty copies of the questionnaire were retrieved and used for the study.

Method of data analysis: The responses to the questionnaire items were tabulated. The percentage and mean responses to the items were computed. Based on the 4-point scale, any item with mean of 250 – 4.00 is an important item while below it is not important.

Results

Results indicated that 23(19.2%) of the respondents were Home Economics teachers, 20 (16.7%) were lecturers in the universities. These are either Nutritionists or Home Economists). Six (5.00%) were medical doctors. Some (50) (41.6%) were postgraduate Home Economics students; 21 (175%) were nurses.

Table 1: Hindrances to healthy active ageing in Nigeria.

S/N	Hindrances	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean (x)	Standard Deviation	Variance
1	Lack of Knowledge of how to prepare meals to conserve nutrients.	60	58	-	-	3.51	0.50	0.25
2	Malnutrition	56	30	-	-	3.74	0.44	0.20
3	Bad eating habits. For instance							
a.	Eating between meals	20	39	-	-	3.32	0.48	0.23
b.	Eating of junk foods	31	42	-	-	3.42	0.50	0.25
c.	Over feeding	24	40	16	11	2.85	0.95	0.91
4	Living very far away from the market or stores where food can be purchased	30	36	50	4	2.75	0.89	0.79
5	Poverty	30	41	22	-	3.90	0.75	0.56
6	Laziness to prepare nourishing meals	31	40	26	-	3.05	0.70	0.56
7	Conforming to culture which restricts older people from being active.	21	56	5	-	3.20	0.77	0.59
8	Weakness	30	25	16	20	2.71	1.15	1.32
9	Insufficient money to purchase nourishing food for consumption	31	59	29	-	3.04	0.70	0.49
10	Living with relatives that cannot afford nourishing meals.	5	56	38	11	2.50	0.75	0.55
11	High cost of feeding	45	40	18	-	3.26	0.74	0.55
12	Lack of Nutrition Education	17	41	17	6	3.00	0.68	0.46
13	Lack of Health Education	49	39	17	-	3.30	0.74	0.54
14	Lack of Healthy Active Ageing Education	40	37	27	7	2.90	0.43	0.86
15	Poor dentition	22	37	40	16	2.56	0.46	0.84
16	Inactivity	40	29	10	25	2.78	1.12	1.26
17	Failure to do regular exercise of the whole body	15	52	36	15	2.57	0.87	0.76
18	Frequent ill-health	65	23	30	1	3.28	0.87	0.76
19	Low level of education	31	41	-	-	3.41	0.50	0.25
20	Poor hygiene	31	58	18	-	3.25	0.74	0.55
21	Poor up-bringing	46	39	18	-	3.25	0.74	0.55
22	Living in a dirty environment	48	40	17	-	3.30	0.76	0.54

Findings showed that all the items 1 - 22 have their mean above 2.50 (cut off point). This showed that the items were perceived by the respondents as the major factors that hinder healthy active ageing in Nigeria.

Table 2: Measures for Promoting healthy active ageing in Nigeria

S/N	Measures	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean (x)	Standard Deviation	Variance
1	Teaching people to eat balanced diet	27	52	-	-	3.34	0.48	0.23
2	Eating of balanced diet	48	21	-	-	3.76	0.16	0.21
3	Educating people to change their minds to have positive attitude to ageing	38	30	-	-	3.56	0.50	0.25
4	Avoidance of strenuous work	39	15	-	-	3.70	0.46	0.23
5	Avoidance of alcoholism	60	15	-	-	3.83	0.38	0.15
6	Including rest periods as one works	60	16	-	-	3.83	0.38	0.15
7	Educating people on the use of work simplification measures	39	41	-	-	3.49	0.50	0.25
8	Determination to keep oneself healthy	62	13	-	-	3.76	0.46	0.21
9	Adequate nutrition right from childhood and maintained to old age	62	13	-	-	3.82	0.38	0.15
10	Appropriate nutrition education right from primary to tertiary level	40	35	-	-	3.53	0.50	0.25
11	Eating much of fresh fruits daily	49	33	-	-	3.60	0.49	0.24
12	Eating much of green leafy vegetables very often	48	30	-	-	3.62	0.49	0.24
13	Teaching people right from early age the measures to cope with ageing process	26	47	-	-	3.36	0.48	0.23
14	Educating people on nutrition related diseases as caution against eating wrongly	25	49	-	-	3.34	0.48	0.23
15	Prevention of diseases	21	56	-	-	3.27	0.45	0.20
16	Adopting good health habits from early age	32	43	-	-	3.43	0.49	0.25
17	Teaching people what positive ageing entails	39	32	-	-	3.55	0.50	0.25
18	Developing a positive attitude towards ageing/old age	48	21	-	-	3.70	0.46	0.21
19	Developing the act of keeping fit early in life	23	50	-	-	3.32	0.47	0.22
20	Having easy access to medical services	27	53	-	-	3.34	0.47	0.22
21	Having enough money for medical care/services	42	18	-	-	3.34	0.48	0.23
22	Engaging in health promoting activities	38	39	-	-	3.49	0.50	0.25
23	Practicing good oral hygiene	33	37	-	-	3.47	0.50	0.25
24	Avoidance of drug abuse	48	30	-	-	3.62	0.49	0.24

25	Avoidance of sleepless nights	49	29	1	-	3.42	0.49	0.24
26	Going on regular medical checkup	39	42	-	-	3.48	0.50	0.25
27	Doing light exercise before going to bed and after getting out of bed	20	53	1	-	3.19	0.55	0.31
28	Having leisure time for relaxation	14	60	-	-	3.20	0.39	0.16
29	Eating main meals instead of snacking most of the time	14	60	-	-	3.19	0.39	0.16
30	Drinking enough clean water	23	49	-	-	3.32	0.47	0.22
31	Eating of mixed diet comprising of all nutrients in adequate proportions.	35	34	-	-	3.51	0.50	0.25
32	Living in a well ventilated apartment	33	36	-	-	3.48	0.50	0.25
33	Living in a clean environment	44	32	-	-	3.59	0.49	0.24
34	Maintenance of personal hygiene	45	31	-	-	3.59	0.49	0.24
35	Maintaining a clean environment	41	25	-	-	3.62	0.49	0.24
36	Avoidance of intake of soft drinks (processed)	26	40	-	-	3.39	0.49	0.24
37	Eating more of locally available foods (unprocessed foods) such as oranges, apples, yam etc.	38	38	-	-	3.50	0.50	0.25
38	Avoidance of refined foods such as corned beef, sardines, biscuit, processed fruit juice	39	40	2	-	3.46	0.55	0.30
39	Staying socially connected to good people	20	51	-	-	3.25	0.52	0.27
40	Attending social gatherings such as naming ceremonies, wedding, etc.	32	27	2	-	3.49	0.57	0.32

Table 2 showed the mean responses of the items on the measures for promoting healthy active ageing in Nigeria. The table showed that items 1-40 have their mean above 2.50. This indicated that the items were regarded by the respondents as important measures for promoting active healthy ageing in Nigeria.

Table 3: Mean responses and t-test by Nutritionists/Home Economists and Doctors/Nurses on the measures for promoting positive ageing in Nigeria

S/N	Measures	$\overline{X}_1$	$\overline{X}_2$	Df	t-crt	t-cal	Remark
1	Teaching people to eat balance diet	3.65	3.73	45	1.96	-500	HA
2	Eating of balance diet	3.91	3.44	-	-	2.31	HR
3	Educating people to change their minds to have positive attitude to ageing	3.54	3.15	-	-	5.00	HR
4	Avoidance of strenuous work	3.91	3.45	-	-	-10.4	HA
5	Avoidance of alcoholism	3.66	3.74	-	-	-5.00	HA
6	Including rest periods as one works	3.90	3.88	-	-	12.9	HR
7	Educating people on the use of work simplification techniques, especially	3.51	3.75	-	-	-10.3	HA

	in home management						
8	Determination to keep oneself healthy	3.86	3.47	-	-	25.4	HR
9	Adequate nutrition right from childhood and maintained to old age	3.20	2.91	-	-	25.4	HR
10	Appropriate nutrition education right from primary to tertiary level	3.87	4.00	-	-	-12.0	HA
11	Eating much of fresh fruits daily	4.00	3.12	-	-	96.8	HR
12	Eating much of green leafy vegetables very often	3.78	3.35	-	-	1.12	HA
13	Teaching people right from early age the measures to cope with ageing process	3.84	3.88	-	-	0.05	HR
14	Educating people on nutrition related diseases as caution against eating wrongly	3.88	4.00	-	-	-12.0	HA
15	Prevention of diseases	4.00	3.11	-	-	96.7	HR
16	Adopting good health habits from early age	3.76	3.54	-	-	1.12	HA
17	Teaching people what positive ageing entails	3.85	3.47	-	-	25.4	HR
18	Developing a positive attitude towards ageing/old age	3.94	4.00	-	-	-6.92	HA
19	Developing the act of keeping fit early in life	3.19	3.35	-	-	36.0	HR
20	Having easy access to medical services	3.61	4.00	-	-	-26.7	HA
21	Having enough money for medical care/services	3.21	2.91	-	-	80.1	HR
22	Engaging in health promoting activities	3.77	3.35	-	-	1.12	HA
23	Practicing good oral hygiene	3.78	3.35	-	-	1.12	HA
24	Avoidance of drug abuse	4.00	3.10	-	-	96.7	HR
25	Avoidance of sleepless nights	4.00	3.93	-	-	30.0	HR
26	Going on regular medical checkup	3.88	4.00	-	-	-12.0	HA
27	Doing light exercise before going to bed after getting out of bed	3.76	4.00	-	-	-16.6	HA
28	Having leisure time for relaxation	3.15	4.00	-	-	-16.7	HA
29	Eating main meals instead of snacking most of the time	3.11	4.00	-	-	-69.2	HA
30	Drinking enough clean water	3.96	4.00	-	-	-10	HA
31	Eating of mixed diet comprising of all nutrients in adequate proportion	3.99	4.00	-	-	-10	HA
32	Living in a well ventilated apartment	3.59	3.99	-	-	-28	HA
33	Living in a clean environment	4.00	4.00	-	-	0	HA
34	Maintenance of personal hygiene	3.81	4.00	-	-	-20	HA
35	Maintaining a clean environment	4.00	4.00	-	-	0	HA
36	Avoidance of intake of soft drinks (processed)	3.81	4.00	-	-	11.8	HR
37	Eating more of locally available food e.g. unprocessed foods such as	4.00	3.19	-	-	-22.4	HA

	oranges, apples, yam etc.						
38	Avoidance of refined foods such as corned beef, sardines, biscuit, processed fruit juice	3.41	4.00	-	-	-47.2	HA
39	Staying socially connected to good people	3.69	4.00	-	-	-4.65	HA
40	Attending social gatherings such as naming ceremonies, wedding, etc.	2.95	4.00	-	-	-55.8	HA

N, is number of Nutritionists/Home Economists = 20; N_2 is the number of the doctors/nurses = 27, t-crit is the t-critical which is the table t-value is 1.96, t-calc is t-calculated. Degree of freedom is 45. The level of significance = 0.05. HA is hypothesis accepted. HR is hypothesis rejected.

Table 3 showed that items 1, 4, 5, 7, 12, 14, 16, 18, 20, 22, 23, 27, 28, 29, 30, 31, 32, 33, 34, 35, 37, 38, 39 and 40 had their calculated t-value each below 1.96. Therefore the null hypothesis is accepted for these items. This indicated that there were no significant differences between the mean responses of the Nutritionists/Home Economists and the Doctors/Nurses on the measures for promoting positive ageing in Nigeria.

Items 2, 3, 6, 8, 9, 10, 11, 13, 15, 17, 19, 21, 24, 25 and 36 had their calculated t-values above the critical value of 1.96. Therefore the null hypothesis is rejected for these items. This showed that there were significant differences between the mean responses of the Nutritionists/Home Economists and Doctors/Nurses on these items on the measures for promoting positive ageing in Nigeria.

Table 4: The Benefits of Active Healthy Ageing in Nigeria

S/N	Benefits	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean (x̄)	Standard Deviation	Variance
1	Active Health Ageing promotes physical well being	61	47	-	-	3.56	0.50	0.25
2	It promotes social well being	57	59	-	-	3.49	0.50	0.25
3	Active healthy ageing promotes wellness	88	15	-	-	2.85	0.35	0.31
4	Healthy active ageing promotes longevity	70	45	-	-	3.61	0.49	0.24
5	It helps one to be independent	521	63	-	-	3.45	0.50	0.25
6	It increasers mental alertness	89	23	-	-	3.79	0.41	0.16
7	It keeps individuals happy	51	58	-	-	3.47	0.50	0.25

Table 4 showed the benefits of active ageing in Nigeria. All the items 1-7 had their mean above 2.50. This showed that all the items were perceived to be benefits of active healthy ageing in Nigeria.

Discussion of Results

The study identified the hindrances to active healthy ageing and benefits in Nigeria. Some of the hindrances to active healthy ageing arc insufficient money to purchase nourishing food for consumption, lack of knowledge of' how to prepare meals to conserve nutrients, living with relatives who cannot afford nourishing meals, eating between meals; eating of junk foods, overfeeding, high

cost of' feeding, poor dentition, lack of Nutrition Education and laziness in preparing nourishing meals. These factors can result to malnutrition. When people arc lazy in preparing nourishing meals there is tendency to be eating snacks most of the time. Such foods may not be rich enough in nutrients to meet body requirement. All these factors could have been major causes of malnutrition which is a hindrance to active healthy ageing. According to Nnanyelugo, (1992) malnutrition has a very complex etiology. It is related not only to the quality and quantity of food but also to the unsatisfactory physical and psychological environment; poverty, ignorance and infection. World Bank (1993) attributed the cause of malnutrition to poverty. Nnayelugo et. al (1992) outlined some of the effects of malnutrition to include low productivity, low resistance to infection / diseases, nutritional deficiency diseases, high morbidity, and mortality rates. Ega and Almustapha (1996) pointed out that malnutrition leads to functional impairments in terms of' cognitive development, educational performance, impaired work capacity and productivity. These factors resulting from malnutrition can make one age fast and highly dependent on other people for survival.

The study identified poverty as a factor that militates against active healthy ageing. Insufficient money to purchase nourishing food could be as a result of poverty.

Poverty can prevent an individual from having access to education such as Nutrition Education and Health Education. These aspects of education are meant to equip an individual with knowledge and skills in food choice, selection, preparation, consumption, personal hygiene, and health care practices that are meant to keep one healthy and active as one's age increases. According to WHO (1994), poverty has its destructive effect at every stage of' human life. It constitutes the world's deadliest cause of disease, suffering and death.

Lack of Nutrition Education was identified as a hindrance to active healthy ageing. Lack of Nutrition Education is one of the reasons why many people eat the wrong type of food leading to malnutrition (under-nutrition or over-nutrition). Under-nutrition is responsible for the various nutritional deficiency diseases e.g. scurvy, rickets, angular stomatitis, kwashiorkor and marasmus. Obesity is a form of over—nutrition. Scrimshaw, (1997) and Ashworth (1998) pointed out that malnutrition predisposes one to chronic diseases and stroke in later life. With such conditions, active healthy ageing is highly hindered.

Lack of Health Education is a factor that militates against active healthy ageing. Lack of Health Education is one of the reasons for poor hygiene and neglect for healthcare practices. The result of this is extreme exposure to infections and diseases. These are inimical to active healthy ageing. Frequent ill-health could be due to lack of Health Education.

Lack of Healthy Ageing Education was identified as a hindrance to active healthy ageing. It is due to lack of Healthy Ageing Education that makes some people believe that old age is a curse. Such people equate old age to a life of ill-health and over-dependence on people. In view of this, WHO (2002) and Nelson (2005) stressed the need for a change of attitude from a pessimistic view that equates ageing with ill-health and increasing financial burden on the welfare state to a focus on active ageing. If people have this positive change of mind, they will be able to prepare fully to enjoy active healthy ageing as they grow older.

Failure to do regular exercise of the whole body and inactivity were identified as factors which militate against active healthy ageing. Exercise is highly essential to promote good health. Lack of exercise weakens the body system. One of the major causes of obesity is lack of exercise. The art of conforming to the cultural belief which restricts older people from being active is a serious problem. Being physically active could help to keep both old and young people fit and lively. In the light of this Nwagu and Okafor (2008) emphasized that old people need to be active in order to he physically, mentally and socially fit. They warned against the act of retiring to go home to become idle.

The study also identified some strategies for promoting active healthy ageing in Nigeria. One of the measures to promote active healthy ageing is to include rest periods while one works. Imonikebe (2009) stressed the need to include rest period while working to prevent one's health from breaking down. Another strategy is the application of the principles of' work simplification. They are measures to use while working to make work simple, easy to conserve one's time and energy. The measures usually prevent exerting much strain and stress on the body while working. Such techniques make work enjoyable. This is because some of the work simplification techniques involve the use of labour-time-saving devices. They provide for greater work out-put within a short time, with less energy expenditure. The utilization of labour-time-saving devices and work-simplification technique is vital for effective, successful and pleasant management of a home.

Avoidance of strenuous work is important. Engaging always in strenuous work will have adverse effects on the body systems. The strain and stress the body passes through when one engages in such work does not allow for adequate body function. Certain parts of the body could get damaged. Strenuous work can be done with the application of work simplification techniques and the use of labour time-saving-devices.

The act of having leisure time for relaxation is a factor for promoting active ageing. After work, it is very essential to have leisure time to relax, rest, refresh oneself. Such time can be used in watching interesting television programmes such as listening to news, gospel songs, telephoning to friends, counseling people, using some time for studying the Holy Bible, meditating and praying. Leisure time when well utilized can be interesting, refreshing and rejuvenating.

Some of the ways for promoting active healthy aging are as follows: Educating people to change their minds to have a positive attitude to ageing; Teaching people what healthy active ageing means, developing a positive attitude towards ageing and old age. One of the reasons why people have negative attitude to ageing / old age is ignorance. Such people fail to understand that ageing (growing older in age) is a natural process which cannot be stopped. It only ends at death. People need to understand that ageing is a part of life. Ageing is a process of growing into greater maturity. There is need to educate people to value older people as senior citizens that need to be respected. It is of paramount importance to educate people to change their minds to have a positive attitude towards ageing /old age. WHO (1997) stated that one of the ways of promoting active ageing is by having a positive attitude towards ageing. Another method identified from the study is by teaching people right from early age the measures to cope with ageing process. Such measures when rightly applied will to a large extent promote healthy ageing. Some of such measures are regular exercising of the whole body, disease prevention, health care and Nutrition Education. In actual fact, the understanding of what healthy ageing entails will solve a lot of problems. Kalache ((999) viewed active ageing as the process of optimizing opportunities for physical / social wellbeing throughout the life course in order to extend healthy life expectancy.

Healthy ageing can be enhanced by developing the act of keeping fit early in life; starting a fitness programme in middle age and determination to keep oneself healthy. This can be done through regular exercising of the whole body. Regular exercise is very important. The human body needs work and exercise to keep fit and healthy. Nwagu and Okafor stressed the need to be active especially old people in order to be physically, mentally, and socially alright and fit. They condemned the practice of retiring people to go home and become idle. They stated that the value of work is not just in the physical cash that it generates but that productivity itself is a natural and intrinsic demand for self fulfilment and self satisfaction for man. In support of this idea, Gatz (2004) stressed the need to keep working in order to keep the muscles of the heart, lungs and other organs of the body working. Insel and Roth (2004) revealed that human beings jeopardize their health through inactivity which encourages the muscles and even the brain to wither and deteriorate. It was concluded that the more active old people are, the healthier they become (Papilia and Wendkos, 1992).

Having easy access to medical services, having enough money for medical care/services and going for regular medical checkup are measures for promoting healthy ageing. Through medical checkup, certain diseases can be detected early enough and treated promptly to prevent complications. Through medical checkup some diseases can be prevented. Diseases can also be prevented through personal hygiene.

Other health measures for promoting active healthy ageing identified from the study are as follows: engaging in health promoting activities such as oral hygiene, avoidance of sleepless nights, determination to keep oneself healthy; adopting good health habits from early age and prevention of diseases (WHO, 1997). Health is highly essential to personal and national development. Imonikebe (2009) stressed the need for Health Education for maintaining good health for self and national development. She stated that it is only those with good health status that can develop themselves and others.

Some strategies for promoting active healthy ageing are as follows: Living in a clean environment, living in a well ventilated apartment, and maintaining a clean environment. Such practices help in minimizing the occurrence of diseases and infections.

The avoidance of drug abuse and alcoholism are good health practices. Swanbory .and Selke (1993) referred to the avoidance of negative risk factors such as smoking and alcohol abuse. Nwagu and Okafor (2008) stated that smoking and alcoholism are inimical to optional health and should be avoided.

The study also identified nutrition related measures for promoting active healthy ageing as follows - Teaching people the importance of balanced diet; adequate nutrition right from childhood and maintained to old age; Appropriate Nutrition Education right from primary to tertiary level. When adequate nutrition is maintained, malnutrition will be highly minimized.

The consumption of much fruits and fresh leafy vegetables very often is very appropriate. These foods are very rich in nutrients such as vitamins and minerals for adequate maintenance of good health status.

Other health promoting measures are: eating of mixed diet comprising of all nutrients in adequate proportions, eating of main meals instead snacking most of the time. Snacks may not be rich enough in nutrients to meet body requirements.

Drinking enough clean water is necessary for maintaining good health. Water is essential for digestion and prevents the digestive system from being clogged to prevent constipation (Imonikebe, 2009).

The consumption of locally available unprocessed foods such as pawpaw oranges, apples, yams are useful for health promotion. The need to educate people on nutrition related diseases as caution against eating wrongly is important. Some people eat certain foods that are not nourishing enough without knowing the nutritional and health implications. There is need to avoid the consumption of certain refined or processed foods. This is because, during processing, many nutrients are lost. The continuous overdependence on such foods will lead to malnutrition and the occurrence of nutrition deficiency diseases,

Other ways of promoting healthy ageing is by staying socially connected to good people and attending social gatherings such as naming ceremonies, wedding etc. In such gatherings, there is the opportunity to meet people to interact with, relax and have a sense of' belonging. These are a means of light exercise. Nwagu and Okafor (2008) stated that elderly people should be encouraged to maintain an active life style through the following activities: regular exercise, shopping, attending meetings and occasions, visiting, engaging in church activities and reading newspapers.

There were some significant differences in some of the responses of' the Nutritionists / Home Economists and Doctors/Nurses on the strategies for promoting active healthy ageing in Nigeria. The

differences could be due to the differences in the respondents' profession, experience and perception of the subject of active healthy ageing.

The study also identified the benefits of active healthy ageing in Nigeria. One of such benefits is that active healthy ageing promotes physical wellbeing. Kalache (1999) noted this benefit. Being active while one gets older keeps the body organs more functional which helps to keep the body physically alright.

Active healthy ageing promotes social fitness. This was reported by Nwagu and Okafor (2008). It is when an individual is healthy and active that he can easily interact fruitfully with his environment to develop himself and positively influence people. Nwagu and Okafor emphasized that old people need to be active in order to he physically, mentally and socially fit and condemned the act of people retiring to go back home to become idle.

Healthy ageing promotes wellness and keeps one happy. It also promotes longevity. Papilia and Wendkos (1992) revealed that the more active older people are, the healthier they become. This is also applicable to young people. When one is healthy, all things being equal could promote longevity.

Active healthy ageing helps one to be independent. When people are getting old, there is the tendency to depend more on others for survival. When people especially older people imbibe the idea of active healthy ageing they are less dependent on others for survival. This is highly essential most especially now that the world is having population ageing. When people experience active healthy ageing, they will be more functional and productive. Such people are likely to have a high sense of fulfilment as they age actively, healthy and gracefully.

Implications of the study

The study has implications for Nutrition and Health Education. The benefits of active healthy ageing identified from the study are numerous. Active ageing involves being active, lively, healthy and productive as one gets older. In order to achieve this, the knowledge and application of Nutrition and Health principles are very essential. Good eating habits have to be formed and maintained right from childhood to old age. Balanced diet must be strictly adhered to throughout life in order to maintain good health status. In this regard, there is need to form the habit of eating much of fresh fruits and leafy vegetables which must be part of most meals to supply vitamins and minerals for the maintenance of the body. The supply of carbohydrate and protein will depend on the age, health and occupation/work of the individual. Health Education lays a foundation for active ageing. Good health habits have to be formed early in life and maintained through to old age. One of such is keeping fit early in life. Regular medical check up is needed to maintain good health. Through such checkups, certain diseases could he detected early and treated promptly to prevent complications.

The knowledge of hygiene through Health Education could equip one to guard against infectious diseases. This involves personal hygiene, hygiene in food selection, preservation, storage, preparation, service and consumption. In addition, in order to maintain good health, maintenance of a clean environment is of utmost importance.

Conclusion

The study identified the benefits of active ageing. Such benefits are numerous. Active ageing helps one to be healthy from early age through to old age. It promotes longevity. It keeps one young for a very long time. Active ageing prepares one to enjoy old age. The fact that everyone is ageing makes it necessary to imbibe ways to be active, lively, happy and productive as one grows older.

The study also identified measures for promoting active healthy ageing in Nigeria especially for an enjoyable working and retirement period. Some of them are as follows. People need to be taught to age gracefully, upward review of the retirement age up to 7Oyears for those who want it so; adoption of good feeding and health habits from early age; prevention of diseases, teaching people

the benefits of active healthy ageing. If these measures are adopted, many people will enjoy their lives even in old age. Longevity in good health and productivity will be highly enhanced.

Recommendations

1. Active Healthy Ageing Education should be included in primary, secondary and tertiary school curriculum. This will help people to understand the ageing process and develop desirable attitudes towards ageing.

2. People should be educated to see getting old as growing into maturity and that old age can be enjoyed and not endured.

3. The philosophy that equates ageing with ill health, increasing financial burden and dependence should be discarded.

4. People should be educated that living up to old age should be regarded as a thing of pride and not a curse.

5. Senior citizens should be respected.

6. The government should set up old people's homes and employ well qualified persons to take good care of the aged people who do not have reliable relatives to cater for them.

7. Financial planning for retirement for use in old age should start early in life. This will prevent unnecessary expenditure so that they can have enough investment and savings for old age.

8. People should be educated to know that if wellness is optimized during young adulthood, one can exact greater control over the physical and mental aspect of ageing.

9. Emphasis on Active Healthy Agemg Education should be based on the fact that with foresight and energy, individuals can shape a creative, graceful and even triumphant old age.

10. The government should put in place policies that are meant to enhance active healthy ageing.

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Physico-Chemical Properties of Stirred-Curd Cheddar Cheese Manufactured from Farm-reared Camel and Cow's Milk: A Comparative Study

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Abstract

The aim of the present study was to determine the effects of rearing conditions on the quality and acceptability of the cheese produced from the camel milk compared with that of cow's milk under the same environment and during the sixty (60) days of a lactation period. Seven (7) healthy lactating camels and five (5) healthy lactating cows were selected and reared under a good farm condition throughout the period of the experiment. The dams were milked daily but samples for proximate analysis and cheese making were collected at weekly intervals for the sixty (60) days period. Proximate analyses were carried out on fresh pools of the milk samples and on the cheeses while the sensory evaluations were conducted only on the cheeses. The results demonstrated the possibility of making quality and more acceptable cheese from camel milk than from cow's milk, though the yield of cheese from the former was significantly lower (P<0.05) than the latter, 859±11.40g and 883±16.50g, respectively, from ten liters of each milk. Also, the results of chemical analysis of the processed cheeses indicated significant differences (P<0.05) between the mean values of fat in camel milk cheese (28.00±0.75%) and that of the cow's milk (31.5±0.63%), but no significant differences (P>0.05) in their moisture contents, 55.45±1.00% and 57.20±0.41%, respectively. On the sensory evaluations of the processed cheeses, 29% of the panelists indicated that the difference between that of the camel and the cow's milk was negligible, 57% rated the difference as moderate, while 14% of them rated it as large; whereas 78% of the total panelists preferred the stirred hard cheese from camel milk to that from the cow's milk. It was concluded that cheese-making from camel milk could be without any difficulty provided that the proper manufacturing stages are followed.

Key words: camel, cow's milk, cheese, yield, fat, moisture, sensory evaluation.

Introduction

Camel milk is popular in many African countries, and it is traditionally consumed fresh, as raw milk, or in varying degrees of sourness. In most cases, the milk is allowed to ferment naturally at ambient temperatures and without prior heat treatment until it turns sour. The resulting fermented camel milk is known by various names in various countries — *shubat* in Kazakhstan (Thapa, 2000), *gariss* in Sudan (El-Zubeir and Morrowa, 2007; Rihab *et al*., 2008), *susa* in Kenya (Farah *et* al., 1990; Bruntse, 2002), etc. Most camel milk products are consumed locally by herders' families and their animals, and do not reach the urban markets because most of the camel herds are located in the arid and desert areas which are usually far away from the urban centers. At current time, however, camel milk has started gaining more popularity, and consequently, several commercial farms in many countries of the world are being established to supply fresh camel milk or their products to the rapidly increasing number of consumers (Mehaia, 1995). Camel milk is generally opaque white in colour and has an acceptable taste (Yagil *et al*, 1980). The milk normally has a sweet and sharp taste, but sometimes can also have a salty taste due to the type of plants eaten in the desert by the camels ((Rao *et* al., 1970; Khaskheli *et al*, 2005). The changes in taste have also been reported to be caused mainly by the type of fodder and availability of drinking water (Farah, 1996). Daily camel's milk production average is estimated to be between 3 and 10 kg during a lactation period of 12 to 18 months (Farah *et al*., 2007). The pH of fresh camel milk ranges from 6.5 to 6.7 (Khaskheli *et al*., 2005; Mehaia, *et al*., 1995), which is slightly lower than that of bovine milk (Sawaya *et al*., 1984). The values of moisture, total solids, fat, solid not fat (SNF), protein, casein, ash and acidity, expressed as percentage of camel's milk, range from 88.55-90.15; 9.85-11.45; 2.60-3.20; 7.25-8.25; 3.73-3.89; 2.90-3.02; 0.82-0.85 and 0.12-0.14, respectively (Mal *et al*., 2006 and 2007); whereas the cow's milk contents of moisture, fat and SNF, range from 85.5-88.7%; 2.4-5.5% and 7.9-10.0%, respectively; and the proportion of protein, lactose and minerals are 3.25% (of which 3/4 is casein); 4.6% and 0.65%, respectively. The moisture and protein contents of the camel' milk has been found to be higher than that of the cow. Also the vitamin C content in the camel's milk is estimated to be two to three folds higher than that in the cow's milk — making the camel milk a good source of this vitamin to the desert dwellers (Yagil, 1982; Bekele *et al*., 2002). The wide variations observed in camel's milk composition is always attributed to many factors such as analytical techniques used, geographical location, feeding regime, size of samples and breeds, in addition to milking frequency, stage of lactation and parity (FAO, 2001; Farah *et al*., 2007; Konuspayeva *et al*., 2009) The total content of minerals is usually expressed as total ash; this amount varies from 0.60 to 0.90% in Dromedary camel milk (Konuspayeva *et al*., 2009).

It is widely thought that the camel milk is only suitable for drinking (Yagil *et al*., 1984). However various products have been successfully made from Dromedary camel's milk, including soft cheese (El-Zubeir *et al*., 2008; Inayat *et al*., 2003; Mehaia, 2006); fermented milk (Elayan *et al*., 2008), yoghurt (Hashim *et al*., 2008), ice cream (Abu-Lehia *et al*., 1989) and butter (Farah *et al*., 1989; Ruegg and Farah, 1991). These products are still not well developed enough and there is also the need to examine consumer acceptability of these products. There is therefore, scarcity of information on the camel milk fermentation. Thus, the aim of this study was to investigate the effects of rearing condition on the camel milk composition and to determine the physico-chemical properties as well as the of acceptability of stirred-curd Cheddar Cheese manufactured from the camel milk compared with that from the cow's milk.

Materials and Methods

Experimental Animals Rearing Condition

Seven (7) Libyan Maghrebi female Dromedary and five (5) dairy cows were randomly selected for this study. They were reared under the same and good farm condition, in Hassan Suleiman Farm, Harsha, south of El-Zawia City, Libya. The animals were at very good health and

were fed exclusively on the farm with concentrated feeds consisting of grains, seeds and hays of alfalfa and oats. Water was also provided to the experimental animals on regular bases. They were milked every morning. Samples for the analysis and cheese-making were taken, at weekly intervals, from separate pools of milk from the camels or the cows, and for a period of 60 days. The samples were collected in previously cleaned and sterilized polyethylene containers of five liters in capacity and were immediately transported to the laboratory in coolers containing ice blocks, where they were stored until analyzed or processed.

Proximate Analysis

Samples were immediately analyzed in the laboratory for proximate composition — moisture, fat, protein and ash contents and for the total solids and titratable acidity in accordance with the procedures outlined in the AOAC, 2000. Protein was determined through the quantification of the nitrogen content by the standard Micro-Kjeldahl method (AOAC, 2000) and multiplying by a conversion factor of 6.38 to arrive at protein content. Lactose content was determined by a subtracting the sum of protein, fat, ash and moisture from 100. The pH was measured by using pH meter (Model WTW410D8120, Welheim, German), while the titratable acidity was determined by titration of the fresh milk with 0.1N NaOH in the presence of phenolphthalein indicator.

Stirred-curd Cheddar Cheese Processing

Ten liters of the pooled camel or cow's milk sample were batch-pasteurized at 63-65.5^{0}C for 30 min and then cooled to 37^{0}C. Stirred-curd Cheddar cheese was processed in the laboratory, following the steps outlined by Kosikowski (1966) with some modifications. A plastic basin capable of holding 10 liters of milk was fixed in a water bath specially designed for the cheese-making. A freeze-dried culture type "CH - Normal Lactic Fermentol" produced by CHR Hansenis Laboratorium, Denmark, was used to prepare the mother culture. Reconstituted cow milk powder was used as a propagation medium for the culture, and many transfers were made before the culture was finally deployed in the fermentation process. Ten liters of the pasteurized whole camel or cow's milk was inoculated with 2% (v/v) of the culture at 37^{0}C, and allowed to stand at ambient temperature for 30 minutes. 0.25g of calf rennet powder (L.C. Glad and Co., Copenhagen, Denmark) and 20mg of calcium chloride ($CaCl_2$) were added to each of the milk samples. The aim of addition of the calcium chloride was to restore ionic calcium and improve rennetability. The calcium assists in coagulation and reduces the amount of rennet required as well as the clotting time. The clots were placed in a piercing circular cylinder made of flexible stainless metal, to allow the expression of whey from the curds and to give the cheese the desired final shape. Curds were placed in cylinders and allowed to stand for two hours to discharge the whey without any pressing. Then the pressing process was carried out overnight by using the piston of a hand machine. The molds of cheese obtained were transferred to a refrigerator at 10°C to allow them to mature for a period of three days. The purpose of this final processing stage was to modify and improve the appearance, composition, texture and flavour of the cheese, before the sensory evaluations were carried out.

Calculation of percentage cheese yield from the camel or cow's milk was done using the Van Siyke Formula (Abdu Almatallab *et al*., 1983).

Sensory evaluation of the processed cheeses

The triangle test method (Kramer and Twigg, 1970) was applied in the sensory evaluation of cheeses produced from the camel and cow's milk, using the staff and graduate students of the Departments of Chemistry, Biology, Food Science and Technology and some local cheese makers in El-Zawia City, as taste panelists. The parameters sensorally evaluated are given in **Figure 1**.

Statistical Analysis:

Experiments were conducted using a completely randomized design (CRD). The analysis of variance and the significant differences between means were determined using Duncan Multiple Range Test (Montgomery, 1976).

Panelist's Name: ....Date: / / 2012

Dept. / Occupation: ………………………………………………………

Please put the sign X against the sample code that is different from others

Sample Code	Sign (X)
1212	
2213	
1399	

The observed differences between the samples are in:

Texture ☐   Odour ☐   Colour ☐

The extent of the observed difference is:

Negligible ☐   Moderate ☐   Large ☐

The most preferred Code is:

1212 ☐   2213 ☐   1399 ☐

Other observations:..

Signature:………………………………………………………………………

Figure (1): The Sensory Evaluation Model for the Processed Cheese

Results and Discussion

Chemical composition of the fresh camel and Cow's milk

Table 1 shows the result of the chemical analysis of fresh milk samples used in this study. The mean composition of protein and fat recorded from fresh camel and cow's milk were: 2.95 ± 0.19; 3.24 ± 0.05 and 2.82 ± 0.21; 3.60 ± 0.32, respectively. As regards to the physical characteristics, the glossy white colour of the camel's milk was clearly observed, with acceptable taste and less salinity. The pH ranged from 6.45 to 6.61, with an average of 6.56 ± 0.095.

Table 1: The Chemical Composition of the Fresh Camel and Cow's milk Used in this Study

Component (%)	Camel's Milk*	Cow's Milk*
Fat	2.82 ± 0.21	3.60 ± 0.32
Protein	2.95 ± 0.19	3.24 ± 0.05
Lactose	4.57 ± 0.40	4.03 ± 0.60
Moisture	89.66±0.30	89.13±0.70

*means of triplicate analyses

Stirred-Curd Cheddar Cheese Product

The results have proved the possibility of manufacturing hard stirred-curd Cheddar Cheese from the camel's milk. The coagulum formed had a good cohesion, not easy to crush, and the manufacturing processes passed through all the stages without any difficulty. This result, however, does not agree with some of the studies that have indicated the presence of difficulties in the manufacture of cheese from camel's milk — even when large amounts of rennet were used (FAO, 2001; Mohamed, 1990). Also, the coagulum obtained from the camel and cow's milk was similar in terms of the formation time and resistance to cutting. The cutting process resulted in clear and

distinct separate clot cubes of about 1cm^3, which not only had regular shapes, but are relatively similar to clot cubes obtained from the cow's milk. The clot was slowly and continuously stirred with gentle flipping to facilitate the draining of the whey. The draining of curd made from camel milk was characterized by more rapid syneresis compared with that of the cow's milk. The curd from the camel milk was observed to have a relatively stronger cohesion than that from the cow's milk, which industrially, is very acceptable. Results of some studies (Abdu-almutallab *et al*., 1983; Igwegbe *et al*., 1992a; Inayat *et al*., 2003; Obaid *et al*., 2005) indicate that the acidity produced by the Lactic acid bacteria in the coagulum of milk may play important role on the clot strength. It was, however, observed during the present study that proper draining of the whey from the camel's milk curd, through the addition of small quantity of sodium chloride, resulted in curds that are well docked with each other, in a similar manner to the curds from the cow's milk. The addition of the sodium chloride also gave a distinctive salty taste to the manufactured cheese.

Comparison between Cheeses made from the camel and cow's milk

Although it is very possible to manufacture stirred-curd cheese which is both safe and tasty from the camel's milk, as demonstrated by this study, the yield remains relatively lower than that from the cow's milk. Whereas 10 liters of camel's milk produced an average of 859 ±11.4 grams of cheese, an average of 883±16.5 grams was obtained from ten (10) liters of cow's milk, under the same experimental conditions (**Table 2**). Table 2 also shows the percent cloudless of cheese produced from camel's milk (9.50%) as compared with that of the cow's milk (10.33%), while the results of the chemical analysis of the cheese samples — fat and moisture, were 28.00 ± 0.75 and 31.5 ± 0.63, respectively for cheese from camel's milk; and 55.45 ± 1.00 and 57.20 ± 0.41, respectively for cheese from the cow's milk. The percent fat content of the cheese from the camel's milk was significantly different ($P<0.05$) from that of the cow's milk, whereas no significant difference was observed ($P>05$) in moisture percent. These two components, fat and moisture, were determined in the processed cheese because of their important roles in the assessment of cheese quality.

The results of the sensory evaluation exercise demonstrated the existence of minor or marginal differences between the cheese produced from the camel and cow's milk.

**Table 2: Chemical Analysis of Cheese Samples Produced from Camel and Cow's Milks**

Parameter*	Camel Milk Cheese	Cow's Milk Cheese
Fat (%)	28.00 ± 0.75[a]	31.5 ± 0.63[b]
Moisture (%)	55.45 ± 1.00[c]	57.20 ± 0.41[c]
Cloudless (%)	9.50[d]	10.33[d]
Yield (g)	859±11.40[c]	883±16.50[d]

*In any row, means bearing different superscripts are significantly different (P<0.0)

The observed differences were in the taste and texture of the cheeses (**Figure 2**). As indicated in Figure (2), 21.00% of the panelists observed differences in the texture of cheese samples, 11.50% of them noted the difference in the taste, 19.00% of them indicated that the differences were in texture, taste and colour of the cheese samples; whereas 15.60% of the judges have different opinions in taste, colour and odour; 22.30% were not able to detect any difference among the cheese samples. These results are highly comparable with the results of similar studies — including the

results from studies in Tunisia (Ramet, 1987), Libya (Igwegbe *et al*., 1992b), Saudi Arabia (Ramet, 1990), Mauritania (Ramet, 1994) and of Mehaia, 1993, which indicated that taste of cheeses made from fresh camel milk were not only comparable with those from the cow's milk, but was also very satisfactory. Fresh camel milk is generally opaque-white in colour, has a sweet and sharp taste, and can sometimes be salty. The changes in taste of the camel milk are caused by the type of fodder and availability of drinking water. This could also affect the taste and colour of the dairy products, including cheese, made from the fresh camel milk. The judges in this study, however, commended the smooth texture and sharp taste of the curd from the camel milk.

On the extent of variation between the hard cheese produced from the camel's milk and that from the cow's milk, 57% of the panelists adjudged the difference as moderate, 14% rated it as large, while 29% of the judges considered it as negligible (**Figure 3**). Also, 80.30% of the panelists preferred the stirred-curd hard cheese manufactured from the camel milk, whereas only 19.70% preferred the same brand of cheese made from the cow's milk.

Figure 2: Aspects of Differences (%) Between Cheese from Camel and Cow's Milk.
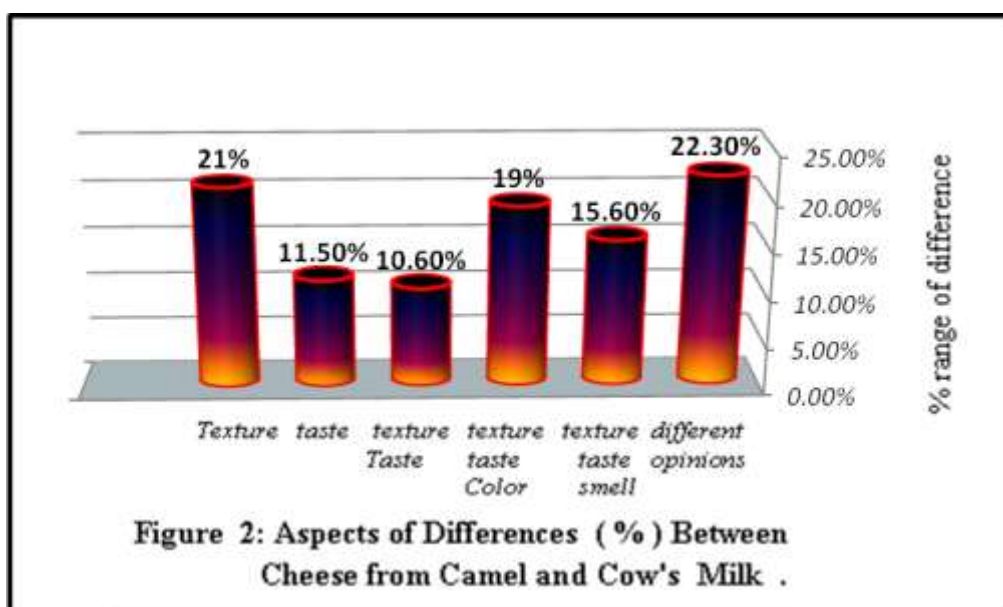
The majority of the panelists acknowledged the existence of a clear difference in shape and colour of the cheese from the camel's milk and that from the cow's milk. They observed that the cheese produced from the camel milk, was whiter in colour and silky in texture. On the other hand, the cheese from the cow's milk was matte white in colour and elastic in texture. 34% of the panelists adjudged the cow's milk cheese as being more elastic than the camel milk cheese. The difference in the elasticity of cheese made from the camel and cow's milk cheese could be attributed to the difference in the casein contents of their respective milk. Although the overall composition of camel milk is similar to cow's milk (Yagil, 1982; Farah and Ruegg, 1989), some differences exist in the molecular composition of proteins and lipids and in the mineral balance

Figure 3: Extent of Difference (%) Between the Cheese from Camel and Cow's Milk .
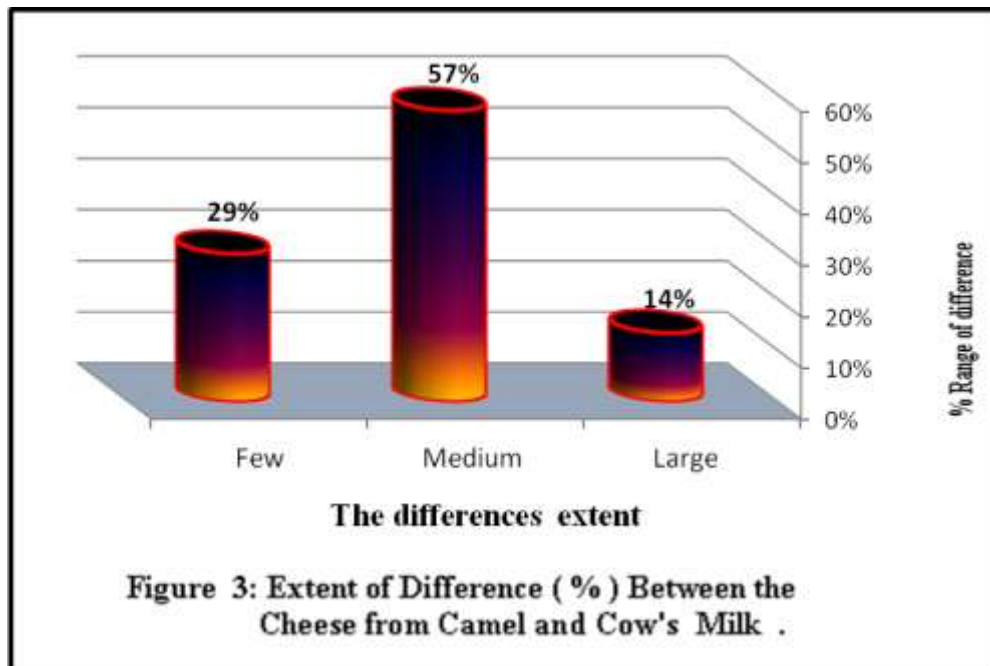
of their milks. The average casein contents in camel milk have been reported to vary between 1.9 and 2.3 %. The nitrogen content of casein is a little lower than cow's milk, reaching 71 to 79% of total protein nitrogen compared with 77 to 82% (FAO, 2001). Also, the casein fractions have been isolated in camel milk and found to be homologous with bovine casein. The casein content of the camel milk is characterized by a low amount of kappa casein, only about 5% of the total casein, compared with about 13.6% in bovine casein (Farah, 1993; FAO, 2001).

Conclusion

It is not impossible to produce tasty, satisfactory and nutritious cheese from the camel milk, especially when the Dromedaries are reared under good farm conditions and the normal cheese-making procedures are carefully followed. Contrary to the claims of some researchers, this study has proved that production of cheese from the camel milk is as easy as using the milk from other domestic animals. Cheese-making process aims to preserve milk so that consumption can be postponed for periods from a few days to several months. The preservation of the product is obtained mainly through lactic acidification and limited dehydration.

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An Analysis of the Effect of Oil Price Shock and Exchange Rate Instability on Economic Growth in Nigeria

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Abstract

This paper seeks to assess the impact of oil price shock and real exchange rate instability on real economic growth in Nigeria on the basis of quarterly data from 1986 to 2012. Time series data was used to examine the nature of causality among the variables. The Johansen VAR-based cointegration technique is applied to examine the sensitivity of real economic growth to changes in oil prices and real exchange rate volatility in the long-run while the short run dynamics was checked using a Vector Error Correction Model (VECM). Results from ADF and PP tests show evidence of unit root in the data and Granger pairwise causality test revealed unidirectional causality from oil prices to real Gross Domestic Product (GDP). The findings of the study shows that oil price shock and appreciation in the level of exchange rate exert positive impact on real economic growth in Nigeria. It recommends greater diversification of the economy through investment in key productive sectors of the economy to guard against the vicissitude of oil price shock and exchange rate volatility.

Keywords: Cointegration, Granger Causality, Oil Price Shock, Exchange Rate Instability, VECM

JEL Classification Codes: F40; F41, F43

1.0 Introduction

Analysis of the impact of asymmetric shocks occasioned by exchange rate and oil price variability on economic growth has been a major preoccupation of both academics and policy makers for some decades now. On the one hand, it has been recognized in the literature that depreciation of exchange rate tends to expand exports and reduce imports, while the appreciation of exchange rate would discourage exports and encourage imports. Thus, exchange rate depreciation leads to income transfer from importing countries to exporting countries through a shift in the terms of trade, and this affects the economic growth of both importing and exporting nations. On the other hand, the perception that oil price spikes have a serious negative effect on the economies is based largely on the close correlation in the timing of oil price spikes and economic downturns. While Greenspan (2004) noted that the impact of oil prices alone in modern market-based economies is difficult to infer in a way in which policy is automatically obvious, McKillop (2004) argued that higher oil prices reduce economic growth, generate stock exchange panics and produce inflation, which eventually lead to monetary and financial instability. It will also lead to higher interest rates and even a plunge into recession. Jin (2008) argued that sharp increase in the international oil prices and violent fluctuation of the exchange rate is generally regarded as factors discouraging economic growth.

Previous research on the impact of exchange stability on growth has tended to find weak evidence in favor of a positive impact of exchange rate stability on growth. For large country samples; Ghosh, Gulde and Wolf (2003) discovered weak evidence that exchange rate stability affects growth in a positive or negative way. Schnabl (2007) builds on De Grauwe and Schnabl (2005) using both GLS (Generalized Least Squares) and GMM (Generalized Method of Moments) panel estimations for 41 countries in the EMU (European Monetary Union) periphery. The results provide evidence in favor of a robust negative relationship between exchange rate volatility and growth. Also, the issue of which regime of exchange rate is susceptible to macroeconomic stability and growth has been extensively discussed in the literature. Proponents of flexible exchange rates emphasized the need for macroeconomic flexibility in the face of real asymmetric shocks while in contrast; proponents of fixed exchange rates have stressed the microeconomic) benefits of low transaction costs for international trade, Frankel and Rose (2002). An oil price increase, all things being equal, should be considered positive in oil exporting countries and negative in oil importing countries, while the reverse should be expected when the oil price decreases.

The challenge, however, of the combined effect of hikes in oil prices and exchange rate instabilities on macroeconomic economic stability and economic growth for oil producing nations like Nigeria is really enormous. Huge inflow of oil revenues in Nigeria are more often associated with expansion in the level of Government spending while periods of dwindling oil revenues are usually accompanied by budget deficits. There is no gain saying that Nigeria relies so much on revenue from oil exports, but, it equally massively imports refined petroleum and other related products. Evidence, for instance, shows that Government spending, which hitherto, before 1999 remained well below N0.5 trillion, hit N1.02 trillion mark in 2001 and N1.5 trillion in 2004. The figures for 2006 and 2007 stood at N2.04 and N2.45 trillion respectively; and further increased to N3.01 trillion in 2011. Furthermore, total imports by the oil sub sector – fuel imports being one of the major components, accounts for an average of 22.4 percent between 2000 and 2007 in the Nigeria's total visible trade. Specifically, the sub sector which accounts for 17.5 percent in 2001 and rose to 28.5 percent in 2005. The figures, however, stood at 27.3 percent and 21.2 percent in 2006 and 2007 respectively; and 28.6 percent in 2011.

Although the naira exchange rate has witnessed some period of relative calm since the implementation of the Structural Adjustment Programme (SAP) in July, 1986, its continued depreciation, however, scored an indelible mark in the level of real sector activities in the country. The naira which traded at N0.935 = $1.00 (United States) in 1985 depreciated to N2.413 = $1.00 and

further to N7.901 against the US dollar in 1990. To stem the trend, the policy of guided deregulation pegged the naira at N21.886 against the dollar in 1994. Further deregulation of the foreign exchange market in 1999, however, pushed the exchange rate to N86.322 = $1.00. With huge inflow of oil revenue due to hike in the oil price, the end-period rate stood at N117.97 in December, 2007. This remained stable until towards the end of 2008 when the global financial crisis took its toll and the naira exchange rate depreciated from N116.20 in November, 2008 to N131.5 in December, 2008 or a decline in value by 12.95 percent and further to N142.00 or a decline by 7.98 percent in February 2009. In spite of these developments, the national income accounts, for the country revealed an impressive performance. Real GDP grew at an average of 5.01 percent between 2000 and 2008 with the highest of 9.6 percent in 2003 and came down to 7.2 percent between 2005 and 2011.

Against this background, the paper seeks to assess the impact of spikes in oil prices and exchange rate volatility on economic growth in Nigeria between 1986 and 2012. The rest of the paper, besides the introduction, which occupies section one, is organized in the following way. Section two dwells on literature review and theoretical issues. Section three presents the research methodology of the paper, section four contains empirical results and discussion, and finally, summary and recommendations are drawn in section five.

2.0 Literature Review and Theoretical Issues

There is consensus in the literature on the impact of exchange rate stability neither on economic growth nor on the mechanism through which oil price fluctuations affect growth. While Macro- and microeconomic analysis of exchange rate system are relied upon in the former, supply and demand analysis of the impact of changes in oil price is used in the latter. From the macroeconomic perspective, Schnabl (2007) argued that theoretically, flexible exchange rates allow an easier adjustment in response to asymmetric country specific real shocks. The microeconomic effects of low exchange rate volatility under the fixed exchange rate system are associated with lower transaction costs for international trade and capital flows thereby contributing to higher growth. Indirectly, fixed exchange rates enhance international price transparency as consumers can compare prices in different countries more easily. If exchange rate volatility is eliminated, international arbitrage enhances efficiency, productivity and welfare. Earlier, Mundell (1973a, 1973b) opined that monetary and exchange rate policies are the chief source of uncertainty and volatility in small open economies and economic growth is enhanced when exchange rate fluctuations are smoothed. Schnabl (2007) argued that even large, comparatively closed economies such as the Euro area and Japan are sensitive to large exchange rate swings, in particular in the case of appreciation.

The transmission mechanisms, according to Jin (2008) through which oil prices affect real economic activity includes both supply and demand channels. The supply side effects are related to the fact that crude oil is a basic input to production, and an increase in oil price leads to a rise in production costs that induces firms' lower output. The demand side effect is derived from the fact that oil prices changes affect both consumption and investment decisions. Consumption is adversely affected because increase in oil price affects disposable income and the domestic price of tradables. Investment is adversely affected because such increase in oil price also affects firms' input prices and thereby increasing their costs. Empirical evidences have shown strong effect of short run and long run adverse effect of exchange rate swings on economic growth performance through the trade channel. The nature of the effect, however, runs in either positive or negative direction. According to IMF (1984) and European Commission (1990) empirical evidence in favor of a systematic positive (or negative) effect of exchange rate stability on trade (and thereby growth) in small open economies has remained mixed. Bacchetta and van Wincoop (2000) found based on a general equilibrium framework that exchange rate stability is not necessarily associated with more trade.

Gravity models have been used as frameworks to quantify the impact of exchange rate stability on trade and growth, in particular in the context of a monetary union. Using panel estimations for more than 180 countries, Edwards and Levy-Yeyati (2003) found evidence that countries with more flexible exchange rates grow faster. Eichengreen and Leblang (2003) found strong negative relationship between exchange rate stability and growth for 12 countries over a period of 120 years. They conclude that the results of such estimations strongly depend on the time period and the sample. Schnabl (2007) found robust evidence that exchange rate stability is associated with more growth in the EMU periphery. The evidence, according to him, is strong for Emerging Europe which has moved from an environment of high macroeconomic instability to macroeconomic stability during the observation period. Other empirical studies examined the role of capital market in ensuring exchange stability and economic growth.

Equally, a number of empirical studies have explored the relationship between economic growth and oil price fluctuations. The existence of a negative relationship between oil prices and macroeconomic activity was discovered by Hamilton (1983) in the United States. Hooker (1994) confirmed Hamilton's results and demonstrated that between 1948 and 1972, oil price variability exert influence on GDP growth. His results show that an increase of 10 percent in oil prices led to a lower Gross Domestic Product (GDP) growth of roughly 0.6 percent in the third and fourth quarters after the shock. Later, Mork (1989), Lee *et al.*, (1995) and Hamilton (1996) introduced non-linear transformations into the models and Granger causality tests. Results confirmed incidence of negative relationship between oil prices fluctuations and economic downturns as well as Granger causation from oil prices to growth before 1973 but no Granger causation from 1973 to 1994. Other studies include: Mork (1989), Hoover and Perez (1994), Federer (1996), Hamilton (1997), Lee and Ni (2002) and Balke *et al.*, (2002). Recently, Gounder and Bartleet (2007) using both linear and nonlinear oil price transformation discovered a direct link between net oil price shock and economic growth in New Zealand.

In addition, oil price shock was discovered to have substantial effect on inflation and exchange rate. In a comparative study of the impact of oil price shock and exchange rate volatility on economic growth, Jin (2008) discovered that the oil price increases exerts a negative impact on economic growth in Japan and China and a positive impact on economic growth of Russia. Specifically, a 10 percent permanent increase in international oil prices is associated with a 5.16 percent growth in Russian Gross Domestic Product and a 1.07 percent decrease in Japanese Gross Domestic Product. On the one hand, an appreciation of the real exchange rate leads to a positive Gross Domestic Product growth in Russia and a negative Gross Domestic Product growth in Japan and China. Nigeria is regarded as the largest oil producing nation in Africa and the tenth largest in the world in terms of oil reserves. With a production level of close to 2 million barrels per day – though this level has been seriously affected due to crisis in the oil production region, Nigeria benefited, handsomely from hikes in the oil since the beginning of second Gulf war.

The balance of payment position of the country remains highly favorable with over 20 months of imports, which translates to over \$55 billion of reserves. Exchange rate was moderately stable between 2000 and 2008, while real Gross Domestic Product growth averaged 5.01 percent within the same period. However, oil consumption in the country heavily relies on the import of refined petroleum and products since the collapse of local refineries in the late 1980s. Thus, over 80 percent of the country's domestic requirements of oil are sourced from imports. The near collapse of the power generation and distribution industry in the country further accentuates the acute shortage of energy. The burden on the government to provide energy resources at subsidized rate became very unwieldy and between 1999 and 2008, the Federal Government of Nigeria has reduced its subsidy approximately 9 times. This seriously affects production, consumption and investment decisions.

3.0 Research Methodology

There is a large number of macroeconomic variables which affects economic growth and may equally be considered, beside oil price shock and exchange rate volatility, as one of the control variables; investment, consumption and government spending, trade, foreign direct investment, etc. Including these variables into the specification increases the fit of the model, but also decreases the degrees of freedom. For this reason the model is restricted to only the chosen variables. Real Gross Domestic Product is, therefore, regressed against the international oil price and the naira exchange rate vis-à-vis the US dollar.

Quarterly data from the first quarter of 1986Q1 to the last quarter of 2012Q4 is used for all variables in country. Data of nominal Gross Domestic Product was obtained from the CBN (Central Bank of Nigeria) Statistical Bulletin and the Consumer Price Index (CPI) from the same source is used as a deflator to compute the real Gross Domestic Product figures. Exchange rate variability was measured using the Consumer Price Index-based real exchange rate, which is derived from the nominal exchange rate using both the US producer and the Nigerian price indexes. We deduced oil price shock as the average quarterly price of internationally traded variety of crude (UK Brent) in US dollars. Using the specification provided in equation 3.1 we tested for stationarity of the series using Augmented Dickey Fuller (ADF) and Phillips and Perron tests.

$$\Delta_{yt} = \alpha_0 + \alpha_1 \, y_{t-1} + \alpha_1 \, trend + \sum_{j=1}^{\rho} \beta_j \, \Delta y_{t-j} + \mu_t \quad\text{-- (1)}$$

where Δy indicates the first difference of yt and p is the lag length of the augmented terms for y_t.

Equation (1) allows us to test whether the variable y_t is a stationary series. The null hypothesis in the ADF tests is that y_t is non-stationary or has a unit root. Furthermore, we carried out the Granger causality test where Granger (1969) proposed a time series data based approach in order to determine causality. The Granger test suggests that x is a cause of y if it is useful in forecasting y. In this framework "useful" means that x is able to increase the accuracy of the prediction of y with respect to a forecast, considering only past values of y. Because the Granger-causality test is very sensitive to the number of lags included in the regression, both the Akaike and Schwarz Information Criteria (AIC) have been used in order to find an appropriate number of lags.

Since the main objective of this paper is to assess not only the pairwise nature of causality among the variables, but, also the short run and long run dynamic impact as well, we tested for

Cointegration using two well known approaches: the one developed by Engle and Granger (1987) and the other one by Johansen (1988) and Johansen and Juselius (1990). In addition, Vector Error Correction Model (VECM) was applied. Economically speaking, cointegration of two variables indicates a long-term or equilibrium relationship between them, given by their stationary linear combination (called the cointegrating equation). The Engle–Granger test is a procedure that involves an Ordinary Least Square (OLS) estimation of a pre-specified cointegrating regression between the variables. This was followed by a unit root test performed on the regression residuals previously identified. We applied the Engle-Granger two-step procedure by estimating equation (3.2) using OLS and then testing the level of stationarity of the residual term.

$$lrgdpt = \alpha_0 + \beta_1 \, loil\_shockt + \beta_2 \, lrer\_volt + \varepsilon_t \quad\text{--- (2)}$$

Equation (2) implies that *lrgdpt*, which is the log of real GDP is a linear function of *loil_shockt*, that is, log of oil price shock and *lrer_volt*, that is, log of real exchange rate volatility. ε_t is the error term. The null hypothesis of no cointegration is rejected if it is found that the regression

residuals are stationary at level. This procedure has some weaknesses, as the test is sensitive to which variable is used as a conditioning left-hand-side variable, which is problematic in the case of more than two variables.

On the other hand, Johansen and Juselius (1990) developed the maximum likelihood estimator for cointegration analysis. Johansen's cointegration test is used as a starting point in the Vector Autoregression (VAR) model. The Vector Autoregression model of order p (VAR (p)) is constructed as a following equation.

$$\Delta y_t = \Phi_0 + \sum_{i=1}^{p-1} \Gamma_i \, \Delta y_{t-i} + \Pi y_{t-1} + \varepsilon_t y_t \text{-- (3)}$$

where y_t is a (3×1) vector of the log of real GDP (*lrgdp*), the log of oil price shock (*loil_shock*) and the log of exchange rate volatility (*lrer_vol*). Φ_0 is the (3×1) intercept vector and ε_t is a vector white noise process. Γ_i denotes an (3×3) matrix of coefficients and contains information regarding the short-run relationships among the variables. The matrix Π conveys the long-run information contained in the data. If the rank of Π is r, where $r \leq n-1$, then Π can be decomposed into two $n \times r$ matrices α and β such that $\Pi\alpha\beta'$ and β is the matrix of cointegrating vectors; the elements of α are known as the adjustment parameters in the vector error correction model. The Johansen-Juselius procedure is based on the maximum likelihood estimation in a Vector Auto Regression model, and calculates two statistics – the trace statistic and the maximum Eigen value – in order to test for the presence of r cointegrating vectors. While the null hypothesis of no cointegration is rejected in the Engle and Granger test if the regression

residuals are found to be stationary at levels, the trace statistic in the Johansen procedure tests the null hypothesis that there are at most r cointegrating vectors against the hypothesis of r or more

cointegrating vectors. The maximum Eigen value statistic also tests for r cointegrating vectors against the hypothesis of $r+1$ cointegrating vectors. Results are reported in the next section.

4.0 Results and Discussion

A. Unit Root and Granger Causality Tests

It has often been argued that macroeconomic data is characterized by a stochastic trend, and if untreated, the statistical behavior of the estimators is influenced by such trend. The treatment, which involves differencing the data to determine the level of cointegration, is carried out in this section using the ADF and PP tests outlined in the previous section. The estimation of equation (3.1) with constant and trend yields the results presented in Table 1. The results show that all the series are non-stationary at level, except *lrgdp*, which is stationary at level at 5 percent under the PP test. Taking the variables in their first difference, results show that all are I(1) at 1 percent level of significance. For consistency, therefore, all the series were considered as I(1) and taken at their first difference in the analysis.

Table 1: Unit Root Test

Variables	Level		First Difference	
	ADF	PP	ADF	PP
lrgdp	-0.74	-3.68**	-10.4*	-22.4*
loil_shock	-0.84	-0.84	-10.6*	-10.6*
lrer_var	-1.81	-2.01	-13.4*	-14.2*

Source: Researcher's Computations

(**)* denotes rejection of null hypothesis at the (5%) 1% levels

Table 2 presents the results of pairwise Granger causality among the real Gross Domestic Product (GDP), oil price shock and exchange rate volatility. The results show that the two null hypotheses that oil price shock and real exchange rate volatility do not Granger cause real GDP could be safely rejected at 1 percent level – a unidirectional causality emanates from oil prices to real GDP while a bi-directional causality runs from exchange rate to real GDP and vice versa. This is consistent with the expectation and with the realities in the Nigerian economy, that is, just as exchange rate appreciation could result in improvements in the real GDP, a rise in the real GDP could also leads to an appreciation in the level of the exchange rate.

Table 2: Pairwise Granger Causality Test

Dependent Variable – lrgdp Sample: 1986 - 2012 Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Probability
oil_shock does not Granger Cause rgdp rgdp does not Granger Cause oil_shock	102	14.1307 2.08047	0.00596 0.13184
rer_vol does not Granger Cause rgdp rgdp does not Granger Cause rer_vol	102	12.0148 5.49041	0.00291 0.00590
rer_vol does not Granger Cause oil_shock oil_shock does not Granger Cause rer_vol	102	6.75439 2.46989	0.00198 0.09127

Source: Researcher's Computations

What, however, is counterintuitive from the result is the realization that *lrer_vol* Granger causes *loil_shock*. It could be noted that although Nigeria is one of the leading oil countries, yet, the result is not tenable because oil is an international commodity whose price is dictated by developments in the global economy and through Cartel pricing policy of Organization of Petroleum Exporting Countries (OPEC). The results further showed that the null hypothesis that real GDP does not Granger cause *lrer_vol* could reasonably be rejected

B. Cointegration Test and Vector Error Correction Model

Having established the order of integration of our series in the preceding section, the next task is to determine the number of long run equilibrium relationships or cointegrating vectors among the variables. Note that when series are found to be integrated of the same order, such as I(1) as in this case, it implies that an equilibrium relationship exists among the variables. Therefore, since the main focus of the paper is to assess how real GDP in the long run reacts to changes in oil price shock and real exchange volatility, we conduct a cointegration test in line with the Johansen test specified in equation (2). Table 3 presents the test results for the number of cointegrating vectors. The results

show that both the maximum Eigen value and the trace statistic suggest the presence of one cointegrating equation among the three variables in the Nigerian economy at 1 percent level in line with the Osterwald-Lenum critical values. This unveils the existence of a long run equilibrium relationship between real GDP and the variables used in the model.

Table 3: Cointegrating Relations

Hypothesized No. of CE(s)	Max-Eigen Statistic	Critical Value [Eigen] at 1%	Trace Statistic	Critical Value [Trace] at 1%
None *	35.07530	25.52	44.97886	35.65
At most 1	8.800888	18.63	9.903556	20.04
At most 2	1.102668	6.65	1.102668	6.65

Source: Researcher's Computations

Max-Eigen and Trace Statistic tests indicate 1 cointegrating equation(s) at 1 percent level.

* denotes rejection of the hypothesis at the 1 percent level.

Next we apply the Johansen procedure to obtain the long run coefficients of the model. Table 4

presents the normalized *(β)* of the variables in the model. All the coefficients were correctly signed and statistically significant at 1 percent level. Both variables depict positive relationship with the log of real GDP. This is consistent with the expectation for an oil producing country like Nigeria. Similar findings were reported by Jin (2008) for the Russian economy, which is a net oil exporter. Theoretically, negative sign is, however, expected for net oil importing countries like New Zealand and Japan as reported by Gounder and Bartleet (2007) and Jin (2008) respectively.

Table 4: Normalized Cointegrating Eigenvector (β)

One cointegrating Equation	Log likelihood	140.0380
lrgdp 1.0000 (0.000)	loil_shock 0.7721 (0.048)	lrer_vol 0.0348 (0.0078)

Extracted from regression output using Eviews, standard errors in parenthesis

Thus, we can derive the cointegrating equation from the above results – with log of real GDP as the regressand while log of oil price shock and log of real exchange rate volatility as regressors, as follows:

$$lrgdp_t = 6.65 + 0.772*loil\_shock_t + 0.035*lrer\_vol_t \text{-- (4)}$$

Looking critically at the numerical values of the coefficients and their respective signs, Equation (4) is saying that a 10 percent permanent increase in crude oil price internationally will cause the real Gross Domestic Product (GDP) to increase by 7.72 percent, while the same 10 percent appreciation in the level of real exchange rate only increases real GDP by 0.35 percent. This shows that Nigeria's Gross Domestic Product (GDP) increases more by oil price increase than by exchange rate appreciation and this is consistent with the expectation. From the point of view of income and output effect of oil price increase, higher oil price transfers income from oil importing countries to oil exporting countries and this results in improvements in the terms of trade and Balance of payments position and hence accretion to foreign reserve. Hence the positive sign of the oil price variable is as expected. The output effect, all things being equal, is also expected to be positive for oil exporting countries largely because the scale of income transfer is enormous. Thus, although the Nigerian economy relies so much on importation of refined petroleum products and the fact that its

industries are highly import dependent, yet the two coefficients bear positive sign. From the perspective of exchange rate depreciation, it is generally recognized that such would encourage exports and reduce imports. Therefore, the positive sign of the coefficient of real exchange rate volatility of the naira reported in equation (6.1) seems unreasonable. This is because Nigeria's oil exports like it was noted by Jin (2008) in the case of Russia are to a large extent invoiced in United States dollars and the demand for oil, globally, is price-inelastic. Alternatively, a plausible explanation on the likely channel of influence of the real exchange rate appreciation could be through imports. Strong naira could provide means of cheap imports from abroad of the needed capital and technological inputs and this could have positive effect on real Gross Domestic Product (GDP) growth.

C. Short-Run Analysis: An Error-Correction Model

The analysis in this section seeks to examine the short run effects of oil price shock and the real

exchange rate volatility on real GDP in Nigeria. The two-step Engle and Granger model suggests that any set of cointegrated time series has an error-correction representation, which reflects the short-run adjustment mechanism. The motive of the analysis is to discover whether the short-run dynamics are influenced by the estimated long-run equilibrium conditions, that is, the cointegrating vectors. A crucial parameter in the estimation of the short-run dynamic model is the coefficient of the error-correction term which measures the speed of adjustment of real Gross Domestic Product (GDP) to its equilibrium level. The estimation of equation 2 using a two-lag specification and by incorporating the error term – (ECM), yields the results presented in Table 5 below.

Table 5: Short run Vector Error Correction Model (VECM)

Variable	Coefficient	Standard error	t-ratio	Probability
ecm(-1)	-0.287*	0.107	-2.688	0.009
dloil_shock(-1)	-10.68	4.911	-2.175	0.033
dlrer_vol(-1)	-0.61**	0.207	-2.931	0.005
dloil_shock(-2)	10.32*	4.650	2.217	0.029
dlrer_vol(-2)	0.147	0.178	0.822	0.414
R2	0.63	D.W Statistic	1.87	
Adjusted R2	0.61	F-Statistic	23.9	0.000

Source: Researcher's Computations

(**)* indicate significance at 1 and 5 percent respectively.

The results from Table 5 show that the parameter of the error-correction terms in the model is statistically significant and correctly signed. This confirms that real GDP in Nigeria has an automatic adjustment mechanism and that the economy responds to deviations from equilibrium in a balancing manner. A value of −0.287 for the coefficient of error correction term suggests that the Nigerian economy will converge towards its long run equilibrium level in a moderate speed after an oil price shock or a fluctuation in the level of the exchange rate. Eliminating, for instance, 95 percent of a shock to the oil price or real exchange rate would take a little less than two years or precisely 7.13 quarters.

5.0 Recommendations and Conclusion

This paper employs an empirical analysis to examine the effects of oil price shock and real exchange rate volatility on the level of real economic activity in Nigeria using a sample of observations from 1986Q1 to 2012Q4. The first step in the empirical analysis involves testing the

time series characteristics of the data series using ADF and PP tests and running the pairwise Granger causality test. This was followed by applying the Johansen cointegration test and the estimation of the long run cointegrating vectors. The analysis was capped with the estimation of short run vector error correction model.

We found out that the variables were characterized by a unit root at level, but, the hypothesis of non-stationarity was rejected at first difference. This is consistent with strand of empirical studies on characteristic of time series data, which according to Engle-Granger require differencing before they could attain stationarity. The Granger pairwise causality test showed that the null hypotheses that oil price shock and real exchange rate volatility each do not Granger cause real GDP could be safely rejected at the 1 percent level. In other words, oil price shock and real exchange rate volatility each Granger cause real GDP in Nigeria within the period of the study. These findings expose the fact that international oil prices and real exchange rate volatility are two key variables that influence economic growth in Nigeria within the sample period. A number of empirical studies earlier cited in the paper have reported similar findings, namely, Mork (1989), Hamilton (1996 and 1997), Balke *et al.* (2002) and Jin (2008).

Next, the Johansen cointegration test revealed one cointegrating equation at 1 percent level using both the trace statistic and the maximum Eigen value. Using the long run vector coefficients, we examined the sensitivity of real Gross Domestic Product (GDP) in Nigeria to shock in international oil prices and the real exchange rate volatility. The results of the long run analysis, for instance, indicated a 10 percent permanent increase in crude oil price internationally will cause the real GDP to increase by 7.72 percent while the same 10 percent appreciation in the level of real exchange rate only increases real GDP by 0.35 percent. This shows that Nigeria's GDP increases more by oil price increase than by exchange rate appreciation and this is consistent with the expectation. Finally, the results from the short run vector error correction model showed the coefficient is correctly signed and statistically significant. This implies that long run equilibrium condition influences the short run dynamics. Real GDP in Nigeria has an automatic adjustment mechanism and that the economy responds to deviations from equilibrium in a balancing manner.

Lastly, theory and evidence have shown that oil price shock has both income and output effects on the Nigerian economy, while exchange rate instability, beside its direct effect on foreign trade, was also found to have significant effect on output via investment. Given the importance of crude oil to the Nigerian economy, therefore, the paper recommends a greater diversification of the economy through judicious investment in the productive sectors of the economy using the crude oil money. Also it is a known fact that exchange rate in Nigeria is primarily anchored by the country's level of excess reserves. Exchange rate stability could, therefore, be achieved even in the face of dwindling oil revenue through a conscious effort aimed at infrastructural development and diversification of the export-base of the economy.

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Communication privacy management in Social Network Sites: the influence of parental involvement and social on information disclosure

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Abstract

The trend of research in Social Network Sites have focused on privacy disclosure and its effect on motivation (Mazer, Murphy, Simonds,2007), relationships (Youn, 2005; Muise et. al.; 2009) and security (Norsaremah Salleh et.al.; 2011). Nevertheless, privacy disclosure needs further attention to address adolescence well being and positive behavior. This study seeks to investigate factors related to parental involvement and social influence on privacy disclosure that influence adolescences' well being. Underpinning the framework of Petronio's theory of Privacy Management, the study extended the factors of culture, social and motivation to explain the behavior of privacy disclosure. Using Structural Equation modeling analysis, this study estimated the relationships of privacy management influenceial factors and well being. The implications of the study included the intervention of parents, schools and universities to educate students formally and informally.

Key words: CPM (communication privacy management), structural equation modeling, privacy disclosure, Social Network Sites

Introduction

The influence of Social Network Sites (SNSs) to the society has changed the way people of all ages to communicate. The need to understand how people communicate has been explored in the field of communication privacy management theory (CPMT) by Petronio (2002). As a multi-dimensional construct, privacy disclosure relates to the self that a person communicates to one another (Wheeless and Grotz, 1976). In the technology of SNSs, there are factors that influence how people disclose their personal information which are; i. culture ii. motivation iii. individual differences iv. situations v. gender (Petronio, 2002).

According to Boyd and Ellison (2008), SNSs center around three ways to disclose information. Firstly, an individual can construct profiles and restrict it when needed. Secondly, an individual can include others with whom they want to share the same interest and information. Thirdly, he can view and surf other contacts among the list whenever he desires. Thus, personal needs are fulfilled when he or she gives access or reveal private information to a circle of private boundary or accepted friends in the cyber world. The nature of managing private information has been studied in the field of CPM. Privacy involves the extent of information is communicated to others (Westin, 1967), achieved from self regulation through interaction with others (Altman, 1975), and a multidimensional nature involving informational, accessibility, and expressive privacy (DeCew, 1997).

The concern of privacy was not addressed in research within the year of 90s. With the advancement of technology namely SNSs, the issue has taken its hype due to the social ills, political unrest and crimes. Recently, many researchers have investigated on the privacy management. Gross and Acquisti (2006) have revealed potential attacks on various aspects of University students' privacy. Norsaremah, Ramlah and Umar (2011) found that trust, and self efficacy became the significant factors to have influenced privacy disclosure. These have proven difficulties to control the boundaries and the information flow between the community members in a SNS environment, since there have always been the so-called trusted friends in the cyber world. Thus, there is a need to discover whether parental involvement as bonded in the culture can influence privacy disclosure and communication flow among the adolescence and adults.

As a basis of the research framework, CPM has been utilized in the context of financial transactions (Metzger, 2007); and SNSs (Mazer, Murphy and Simonds, 2011; Waters and Ackerman, 2011). In SNSs, these researches mainly focused on the impact of disclosure towards motivation, affective learning and risks. In applying the CPM in this present research, the researchers have investigated the factors influencing the behavior of privacy management that drives toward well being of an adult or adolescents. Specifically, the present study seeks to investigate the frequent visit and type of SNSs usage among the adolescents. Secondly, it will also reveal the relationships between parental involvement, privacy management disclosure and well being.

Communication Privacy Management Theory (CPMT)

The theory of CPMT has been forwarded by Petronio (2002) where he postulated the benefits and risks of providing information to people through many contexts. The benefits have been outlined as self expression to relationship development and social control. On the other hand, the risks include the aspects of embarrassment, loss of status and control. These risks will expose the individuals to exploitation by others. The theory also emphasizes on developing rules as to help the individuals maximize the benefits and minimizing the risks at the same time. Thus, what, when and to whom shall a person disclose her personal information must be guided by her own principles or regulated rules developed by herself.

In managing the boundaries, the theory postulates that individual must first decide on when and what situations are necessary to reveal or to withhold information. Secondly, the boundary of coordination where negotiation usually takes place between partners in order to disclose or not. The

third aspect in managing communication boundaries in privacy management involves the boundary of turbulence in which different rules are set by individuals. This can result into privacy rule violations where other partner may not be pleased with the information exposed to others.

In CPM, Petronio (2002) postulates that gender, contextual, culture, and motivation criteria can influence the extent to which individual can disclose their information to the public. Gender is the influenceial factor that affects the circle of social friends involved that leads to rules operated and understood. Contextual is referred to the physical and social environments whether information should or not to be shared. Further, the culture criteria mold the person's attributes of sharing and expectations. Motivation is somehow linked to self clarification and forming bonds of relationships. Petronio, Martin, and Littlefield (1984) have revealed earlier that risk-benefit is also the factor that influences privacy disclosure. It carries the weight of considerations to social acceptance, shame, embarrassment, knowledge sharing and others.

Parental involvement in privacy disclosure

Positive parenting has always triggers adolescents to disclose his personal information to the parents. Thus, it builds up positive and strong relationship in the family. Hunter, Barber, Olsen, McNeely and Bose (2011) have proven that adolescents across culture will generally perceive to be social competent whenever he discloses to his parents about personal information. Previous researches have shown that parents can influence their adolescents to manage their privacy disclosure that results healthy peer relationship (Tocik & Pecnik, 2011) and positive well being related to self esteem and self evaluation (Cripps & Zyromsky, 2009).

In contrast, Petronio (2002) concludes that Asians have high family loyalty and obedience as compared to the West. Family loyalty and parenting involvement will not be able to influence adolescents' behavior without submitting themselves to religion or cultural values. Religion regardless Budhism, Hinduism, Christians and Islam has profoundly influenced the Asians (Hasan Langulung, 2001; Reid,1993). However, the development of ICT specifically the social networks has further influenced the integration and assimilation of values and culture from the West. This has raised a concern among the scholars on curbing and sustaining the religion values among adolescents. Morr et. al. (2008) have argued that parents do not appear to change their children decisions about privacy management regardless of whether they stay in one roof or not with their children. This indicates that values nurtured by parents are deeply internalized by their children with or without their parents' presence. With the technology of Web 2.0 namely Facebook, there will be a bigger space, circle of friends and opportunities for adolescence to open up their feelings to others regardless of their personalities. As a result, culture, family and parents may or may not influence the young adults' behavior in social network environments. Petronio (2002) and Lewis et. al (2008) however, agree on the social use and general cultural adaptations as factors among those influencing privacy management practices. Thus, there is a need to investigate the privacy management among Malaysian adolescents and young adults as it will further contribute to the literature of privacy disclosure in SNSs. Despite the religious values and parenting involvement can bound the privacy disclosure, adolescents may have their own set of rules constructed through the social influence from their peers.

Social influence in SNSs

The main reason on why people stay connected in Facebook is to maintain relationships with new and old friends and updated with this new trend of social network. However, despite many people are aware of the risks in disclosing their personal information and feelings, Govani and Pashley (2005) have discovered that students did not take any measures to protect their privacy. This implies that social influence play a vital role in shaping the adolescents' behavior whether in real or cyber world.

Lewis et. al.(2008) argue that individuals who have more friends will use private profiles that is similar with her or his friends. Thus, the values ascribed by parents will mold the adolescents' behavior to choose a good circle of friends who have similar interest and values. Lenhart (2009) has found that many parents are also involved in using Facebook in order to monitor their adolescents activities. In line with Lenhart, Child (2007) has further concluded that the increased in parental involvement on using Facebook and SNSs in general will promote young adults and adolescents to consider the potential of parental friends' requests to be included in the social network. Thus, parents and their parental friends become the young adults' surveillance and will limit their privacy disclosure.

Conceptual Framework

In applying the CPM in the context of SNSs in Malaysia, the researchers expanded the factor of culture to include parental involvement. Parental involvement is determined by monitoring adolescents activities, advice, and setting rules. As for contextual factor, social influence is studied on the aspect of peer influence and social expectations. The expansion of the factors studied in CPM has been explored to influence adolescence privacy management behavior and their well being in the context of SNSs in Malaysia.

In providing a clearer framework for the research, managing privacy disclosure is referred to reveal relationships status, personal profiles, accepting friendships and knowledge sharing which are bounded by rules. Thus, by practicing the appropriate behavior on line will enhance their feelings of social relationships, self motivated and satisfaction. As a postulated model, the following hypothesized model (Figure 1.) will illustrate the factors involve in the expanded CPM theory in Malaysian context.
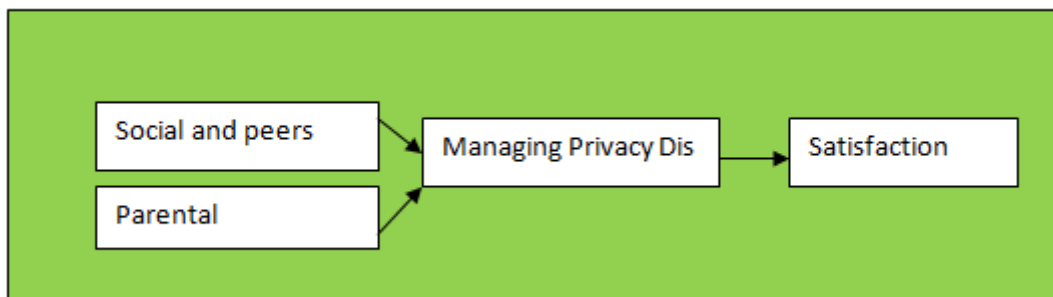

Figure 1.0: Hypothesized model of CPM in SNSs

Based on the postulated model, the following hypotheses have been tested.

H1: Parental involvement influences privacy management disclosure

H2: Social and peers influences privacy management disclosure

H3: Privacy management disclosure influences satisfaction

In answering the hypotheses, the researchers utilized quantitative methodology research design to provide responses from a survey throughout Malaysian schools and Universities.

Research Design and Methodology

The research has been designed to accommodate the structural model analysis. Thus, the questionnaire has been constructed based on the theories and previous researches. There were 50 questions to address the five factors namely; parental involvement, social, privacy management disclosure and satisfaction/well being. Demographic variables were also included covering the information on gender, age, religion, race and type of SNSs and frequent use.

The questionnaire was validated through the process of content validation by two experts from Instructional technology and administration fields. Secondly, the questionnaire was piloted with

200 students of year one (18-19 years old) from the International Islamic University Malaysia to represent the adolescents. The reliability test of Cronbach's Alpha (1960) was estimated to be 0.78 to ensure consistency of the items for further use in the final study. Amendments have been made by rephrasing and deleting to address the weak questions. As a final survey, a total of 900 respondents were distributed to 5 Malaysian schools and 3 Universities. This was to represent adolescents and early adulthood population.

Analysis Procedure

Descriptive statistics were computed to provide the distributions of mean and standard deviations. For the purpose of validating the model, the items related to privacy management disclosure were then re-coded to ensure positive management regulated by rules. All the items of the factors were run separately to conform the convergent and construct validity using Confirmatory factor analysis (CFA). The Statistical Package for Social Science (SPSS) Version 15.0 (SPSS Inc., 2006) was used to compute the descriptive statistics and to perform reliability. Analysis of moment structures (AMOS) Version 16.0 (Arbuckle, 2005) with Maximum likelihood estimation (MLE) was used to perform confirmatory factor analyses (CFA) and covariance structure analyses or structural equation model (SEM). A selection of variables was based on the CFA where only loadings of 0.5 and above were taken for final analysis of SEM. All violations have been addressed (error variances >0.8) with model fit indices were in the threshold point (rmsea<0.08, CFI-comparative fit index>0.9, Tucker Lewis fit indexLI>0.9, GFI-goodness fit index>0.9). p significant value is expected to be non significant (>0.05) to indicate a fit model to the data.

Results

There were 885 students responded in the survey. The respondents are made up 486 males and 399 females giving a good equal distribution of gender. The highest age group is 14 to 16 years of old representing the school population. (refer Table 1.0)

Table 1.0:age group of respondents

		Gender		
		Male	Female	Total
agegroup	1.00	228	256	484
	2.00	148	101	249
	3.00	1	5	6
	4.00	55	20	75
	5.00	53	10	63
	6.00	1	7	7
Total		486	399	885

Note:1(14-16 yrs),2(15-17yrs),3(18-20 yrs), 4(21-23 yrs), 5 (24-26 yrs), 6 (27 yrs and above)

The results show that majority of the participants have 70.5% of Facebook account, followed by 19.3% of Twitter followers. The least is Linkedin (2%). (see Table 2.0). This is in line with the report cited in Cohler (2005) where Facebook statistics reveal that five million accounts have been created with 70% of these account are accessed daily.

Table 2.0: The most active SNS account and time spent daily

		SnsUsage				
		less than 1hour	Betw1 and3hrs	Betw3hrs and 5hrs	morethan5hrs	Total
ActiveSns	Twitter	52	94	50	33	229
	Facebook	184	259	104	51	598
	Blog	9	4	9	1	24
	Myspace	8	2	2	3	16
	Google+	9	0	2	4	15
	Linkedin	1	2	0	0	3
Total		263	361	167	88	885

Based on the most active account, the majority of the participants reveal strong fans of Facebook (598 users or 67.6%), followed by Twitter (229 or 25.9%), MySpace (16 or 1.8%), Google+ (15 or 1.7%) and Linkedin (3 or 3.4%). They have reported to spend between 1 to 3 hours daily (259 or 29.3%) while only 51 (5.8%) of them use more than 5 hours for reading and responding to Facebook. The majority of them (94 or 10.7%) also tweet to their friends in the time frame of 1 to 3 hours. The moderate use of social networking is expected as the majority are school students (age 14 to 17) where they have limited time to access the Internet at home.

Table 3.0: mean score and standard deviations of managing privacy disclosure

	Mean	Std. Deviation
Accepting friendship request from unknown person is a normal culture on social network	3.4045	1.29618
Acceptance of friendship request from unknown persons should be without investigation	2.8328	1.23818
I have no problem in sharing my lifetime photos on SNSs	2.7887	1.21430
Putting my biography/Background on SNSs is ideal to me	3.1435	1.13499
I put photos of my recent trip on my SNSs	3.0768	1.19045
I share my health issues on SNSs	2.6904	1.22066
I look for anything that I want for online	3.0102	1.22793
I usually disclose my exact location on my SNSs profile	2.6124	1.26744
It is ideal on SNSs to get hold of other personal information without their knowledge	2.7605	1.29007
I do not mind if other people use my personal information on SNSs for any purpose	2.2113	1.28931
Anything that happen to me (Good or Bad) I always update profile.	3.0972	1.31457

Using the 5-Likert Scale (1-never, 2-seldom, 3-sometimes, 4-often and 5-always), Table 3.0 reveals the distribution of mean score ranging from 2.2113 to 3.4045 for the items representing management of privacy disclosure. Overall scores show that the adolescents and young adults in Malaysia do not reveal high frequent practice on disclosing their privacy to others.

The lowest mean score (M=2.2113) is represented by the item (I do not mind if other people use my personal information on SNSs for any purpose). This indicates that the adolescents chose to respond as *seldom* in allowing other people to use their personal information.

The highest mean score (M=3.4045) is represented by '*Accepting friendship request from unknown person is a normal culture on social network*'. This response highlights the adolescents sometimes accept request from unknown people. Based on the descriptive data, it can be concluded that majority of adolescents in Malaysia are using Facebook as the main stream of social network.

Majority of them are careful in their daily practice to disclose private and personal information. When asked about friendship, pictures, and sharing biography, they are likely to show their frequent practice to allow other users to access it (mean scores are 3.09 to 3.41). This indicates that they are very careful about building a reputation and friendship in the cyber world.

To address the second purpose of the study where relationships of factors (parental involvement, social, managing privacy disclosure and life satisfaction) are estimated using structural equation model analysis, all the factors and items have been estimated using AMOS version 16. All the violations of estimation were addressed. Items that contributed to error variances of greater than 1.0, high modification indices, and non significant values of paths have been deleted. The final results (see Figure 2.0) have shown that the hypothesized model is accepted with a good model fit (RMSEA=0.042; CFI=.945 and TLI=.939). Despite the model is valid and accepted, the path of parental involvement and managing disclosure is not significant (Critical Ratio =1.7; CR <1.96). Thus, the model has been further re-specified. Figure 3.0 illustrates the re-specified model where parental involvement factor has been deleted from the model. The detail items and standardized parameter estimates are provided in Table 4.0.

The re-specified model includes social, privacy management disclosure, life satisfaction. Parental involvement factor has been dropped due to non significant relationship with privacy management. The model has shown a good model fit with all significant paths.

Table 4.0: Standardized parameter estimates for paths and items

Paths			
managing privacy_disclosure	<---	Social	.576
managing privacy_disclosure	<---	religion practice	.112
life satisfaction	<---	managing privacy_disclosure	.564
Item loadings			
SIF37	<---	Social	.651
SIF34	<---	Social	.662
SIF36	<---	Social	.571
SIF38	<---	Social	.676
BP61	<---	managing privacy_disclosure	.492
BP59	<---	managing privacy_disclosure	.556
BP56	<---	managing privacy_disclosure	.536
BP64	<---	managing privacy_disclosure	.613
LS65	<---	life satisfaction	.710
LS66	<---	life satisfaction	.889
LS67	<---	life satisfaction	.869
LS68	<---	life satisfaction	.678

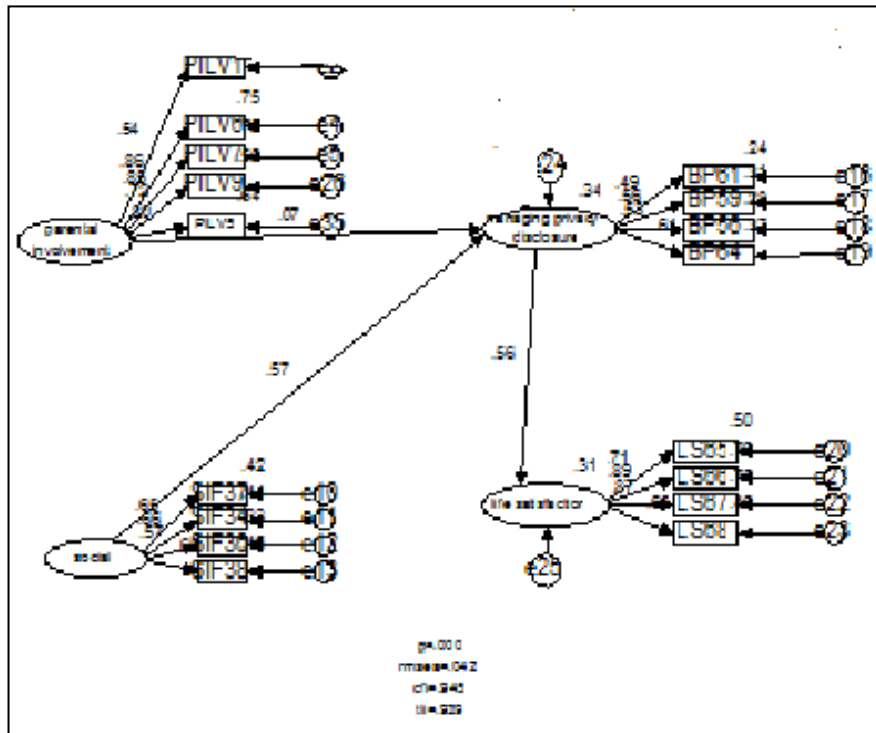Note: all relationships and items are significant at C.R. >1.96.
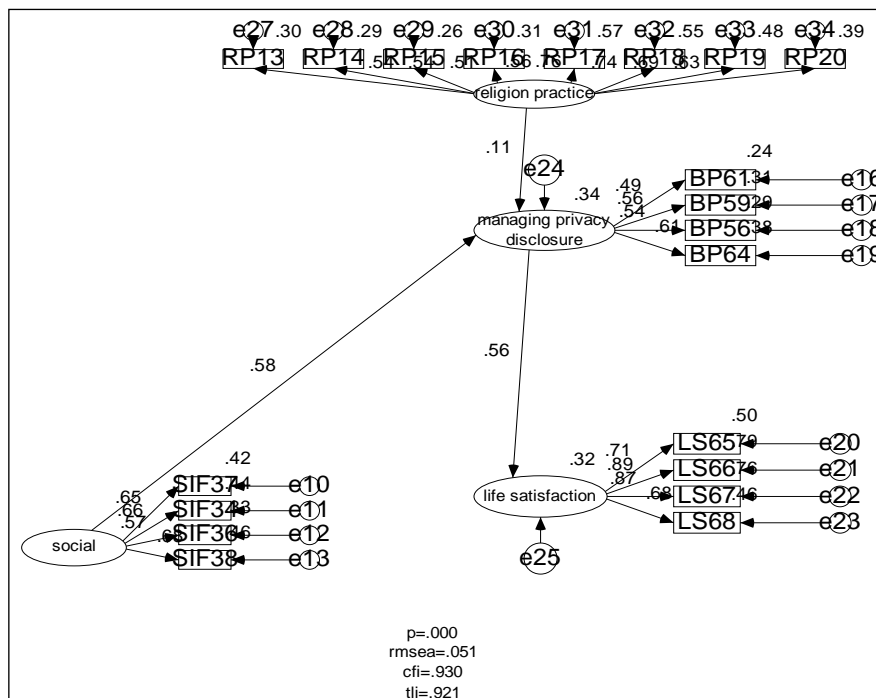
Figure 2.0: hypothesized structural model

Figure 3.0: re-specified hypothesized model

Relationship between parental involvement and privacy management (H1)

Parental involvement has been detected by the explanation of items; always ask on their children' activities, reminding what is good and bad, reminding about the exposure of SNS that cannot be curbed and to communicate well. These reminders and advice do not really affect the adolescents and young adults to manage their privacy management. Thus the hypothesis of direct relationship of parental involvement and privacy management SNSs is not accommodated. The

standardized parameter estimate (β=0.07) with critical ratio is 1.87 shows a weak relationship and does not carry practical importance (Kline, 2010). There is an indication that parental involvement in SNS is not strong enough to influence the adolescents in managing their privacy. Despite the majority of students participated in the study encompassing adolescents of age group from 14-17, it has shown that parents are not directly involved and aware of their children activities in the SNSs. With the religious background and teaching provided by the parents, it is sufficient to mold the adolescents' actions and behavior without directly monitoring the social network activities. In line with Morr et. al.; (2008), they indicate that parents do not change their children decision making in privacy management in social network regardless they stay together or otherwise. Thus, parents can involve in another way which is the childhood development that ascribe the positive values in the adolescents.

Relationship between social and privacy management (H2)

The influence of social or peers on the adolescents to manage their personal profile is significant (β =.58, C.R.>1.96). Information that is communicated to the social friends will improve their self regulation (Altman, 1975). Due to the social factor which detects the items of "*rely on friends' advice in the SNSs activities, Social network communities motivate my usage of SNSs, confident with my SNSs friends to do anything in accomplishing a task, and motivated by extended community in SNS*' has influenced the adolescents to 'Sharing ideal biography, health issues, information on exact location and updating profiles'*. There seems to show that these adolescents have developed the trust within the social network community. Parallel with Norsaremah, Ramlah, Umar (2011)'s findings where they found that trust and self efficacy influence significantly on privacy disclosure. Thus, adolescents may not take measure to protect their privacy which is in line with Govani and Pashley (2005). Social becomes the entity to set the boundaries among the adolescents, whether giving approval and disapproval to actions taken in the SNSs.

Relationship between privacy management and well being/ life satisfaction (H3)

Privacy management where adolescents and young adults have '*Sharing ideal biography, health issues, information on exact location and updating profiles*' has shown a strong relationship with their satisfaction and enjoyment (β=0.56, C.R.>1.96). They were found to *reflect enjoyment when communicating in SNS, love to use SNSs, be in the SNS environment and love to socialize with friends their updates and trends*.

Adolescents and young adults are expressive in the SNSs environment that enjoyment seems take very important factor as the outcome when disclosing their private information. Many researchers have shown enjoyment is enhanced through the use of online mass customization process (Dellaert & Dabholkar, 2009), and when choosing and using technology (Wolfinbarger & Gilly , 2001).

Discussion and Implications of Finding

With reference to the research question that guides this study, it can be stated that positive relationships exist between parental involvement, privacy management disclosure and satisfaction/well being. Managing disclosure involves the ability of a person to weigh the benefits and risks (Petronio, 2002). The hypothesized structural model has been tested and proven to be valid only when it was re-specified. The re-specification of the hypothesized model was deemed necessary, because the parental involvement factor does not take an important role to signify the boundaries of privacy management.

The findings also show that when it comes to building and expanding friendship in the social network, adolescents have no doubt in sharing with others and even with strangers. Another aspect of disclosing is due to trust. When other friends have the trust in certain people, the adolescents may also want to share the personal information. This relates to the strong influence of social or peer

influence on disclosure (eg. Govani and Pashley, 2005). However, the adolescents are still careful in managing their privacy. The main outcome and issue is about being happy and the feeling of enjoyment to be in the SNSs. To be accepted in the community is crucial in adolescents and young adults' lives.

Thus, the findings have led to the suggestions that more effort need to be taken in parental involvement in their adolescents and young adults activities in SNSs. Despite being taught as a subject in school, moral or instructional technology curriculum must also evolve parallel with the advancement of technology. Teachers must educate the students on the importance of privacy for security reason and personal dignity.

The intervention of parents must be more serious and put into effective strategies. Thus, media, schools, and universities must thrive hard to engage social network as a trend to provide a flow of information and knowledge rather than merely for fun and enjoyment. If otherwise, the adolescents will be influenced by negative values spread on the SNSs. The findings however must be well addressed before generalizing to a bigger population in different context. More efforts need to be carried out to further validate the instrument in different context.

Limitations of this study include the fact that the researchers did not further provide information or clue on compatibility of the re-specify model with regards to the group of respondents (adolescent) used in the study. Thus, we cannot be assertive that the model is compatible with other age group. There is possibility, that the re-specified hypothesized model described herein, does not take the unique nature of university students (adults) who have minimal parental control where the use of SNSs for the purpose of business, education, religious, communicating with friends e.t.c., (*presumed to be self-controlled*) are taken into consideration. Unlike the secondary school students, who mostly use SNSs for chatting and social activities; they are likely to be highly monitored by their parents.

To deal with this limitation, future research should consider testing the moderating effect of the model via invariance analysis for the different age groups of students.

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The State of Interdisciplinary to Ceramics towards Technological Advancement in Nigeria

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Abstract

Pottery practice which can also be referred to as traditional ceramics is the art of making different products ranging from hygienic pots to tableware using clay and fired to harden them. Today, pottery has metamorphosed into ceramics which is not only seen as an art of using clay alone to produce wares, but as the art and science of making and using solid article composed of organic, inorganic and non-metallic materials that are fired. The interdisciplinary studies through scientific experimentation of clay with inorganic and non-metallic materials, has uplifted the phase of ceramic art/design in the developed countries. However, the state of ceramic practice in Nigeria has not in practice embraced interdisciplinary studies. This study adopted survey research using descriptive approach in focusing on interdisciplinary field of study of computer science and Chemistry as it could be synthesized into the craft based ceramic practice, to promote speedy accomplishment of ceramic products in design approach, quality and uniformity towards technological advancement of ceramic practice in Nigeria.

Keywords: Ceramics, Design Approach, Interdisciplinary, Technological Advancement, sustainability.

1.0   Introduction

Pottery practice which can also be referred to as Traditional ceramics is clay hardened by the action of heat which in its widest sense includes a variety of materials such as brick, terracotta, earthenware, stoneware, bone china and porcelain. The difference in these materials can be associated with proportion at which the raw ingredients are mixed, their method of preparation and the temperature at which they are fired (Haggar, 1989).

Traditional ceramics has served man's need in many ways as most of our homes are built and roofed with baked clay, and also as utilitarian to enable them to store, prepare their food and carry water. The development over traditional ceramics was the embellishment of products produced by patterns, colouring and glazing which metamorphosed into ceramic art as being practiced in our institutions today. This trend has gone beyond the art and science of making and using solid articles formed by the action of heat on earthy materials, which is far more comprehensive than a common definition of pottery or earthenware. There are different definitions to ceramics that express the technological advancement made in the field in terms of material composition, involving clay with inorganic and non-metallic material by heat treatment to produce composite body that can withstand high temperature.

The tremendous stride accomplished over the centuries in the field of ceramics is none the less the effort of interdisciplinary studies. Ceramic art have witnessed improvement in design approach, quality and uniformity in mass production of ceramic products due to the fact that it has embraced the use of Computer Aided Manufacture / Computer aided Design (CAM/CAD) in generating designs, improved the quality of products manufactured by chemically analyzing the material composite before production and has explore the use of machinery such Rapid Prototyping (RP) machine for improved uniformity in products.

Today, the word ceramics mean different things to different people based on the interrelationship of ceramics with other allied field of studies which has formed the bases for high tech ceramics as the later form of ceramics. The interdisciplinary studies through scientific experimentation of clay with inorganic and non-metallic materials, has uplifted the phase of ceramic art/design in the developed countries. However, the state of ceramic practice in Nigeria institutions and small scale enterprises has not in practice embraced interdisciplinary studies which could gear the level of local ceramic products in Nigeria market. This study then reviews areas in which interdisciplinary study could promote ceramic practice in Nigeria towards technological advancement.

1.2   Conceptual Definition of Interdisciplinary to Ceramics

Interdisciplinary in its simple context can be referred to as the characterization by participation of two or more fields of study. The converging point or interrelationship of two or more study may perhaps be in the use of the same material or in their processes of production. Ceramics is a field of study that cut-across the field of Art, Science, Engineering and Social sciences. This makes the word ceramics to mean different things to different people. In the definition of Kingery (1976), it shows that ceramics involves the art of designing which can be related to Art or Engineering. The production aspect of manufacturing a product using earthy materials which include inorganic and non metallic materials that are formed by the action of heat could also be linked with the disciplines like Art, Engineering and Science. Meanwhile, the behavioural science field as related to ceramics involves ergonomics, thinking of what to be produced, how to produce and also considering the group of people that are to consume the product by meeting their demand.

In recent times, the discovery of the original art of pottery making in the use of material to the finished product as science and engineering have helped to break new grounds of opportunity in the field. However, many ceramic artists today still try to run away from the fact that ceramics material processes and production is practically scientific. Most of them still depend on the craft

method of material processes and production based on assumptions and trials which the researcher termed traditional ceramics.

Ceramics for today's engineering applications has been considered to be non-traditional. Traditional ceramics are the older and more generally known types, such as: earthenware, porcelain, bricks etcetera, while the new and emerging families of ceramics are referred to as advanced, new or fine, and utilize highly refined materials and new forming techniques. The new trend in ceramic application towards technological advancement in the production of spark-plug, its usage as furnace lining, rocket nose cone etcetera is no doubt the result of interdisciplinary action in the material processes and formation. Thus, there is urgent need for interdisciplinary study with ceramic craft practices in Nigeria for better production.

1.3   Advances in Ceramic Technology in the Twentieth Century

The 20th century has produced the greatest advancement in ceramics and materials technology since humans have been capable of conceptive thought. The extensive metallurgical developments in this period have now produced almost every conceivable combination of metal alloys and the capabilities of those alloys are fairly well known and exploited. The push for even faster, more efficient, less costly production techniques continues today. As the limits of metal-based systems are surpassed, new materials capable of operating under higher temperatures, higher speeds, longer life factors and lower maintenance costs are required to maintain pace with technological advancements. Metals, by virtue of their unique properties: ductility, tensile strength, abundance, simple chemistry, relatively low cost of production, case of forming, case of joining, etcetera. have occupied the vanguard position in regard to materials development. By contrast to metal-based system, ceramics is brittle by nature, having a more complex chemistry and requiring advanced processing technology and equipment to produce, perform best when combined with other materials, such as metals and polymers which can be used as support structures. This combination enables large shapes to be made; the Space Shuttle is a typical example of the application of advanced materials and an excellent example of the capability of advanced materials.

1.3.1   Recent Advances in Ceramic Technology: It is only during the last 30 years or so, with the advances of understanding in ceramic chemistry, crystallography and the more extensive knowledge gained in regard to the production of advanced and engineered ceramics that the potential for these materials has been realised. One of the major developments in the field of ceramics this century was the work by Ron Garvie *et al* as cited in Taylor (2001) at the CSIRO, Melbourne where PSZ (partially stabilised zirconia) and phase transformation toughening of this ceramic was developed. This advancement has changed the way ceramic systems were viewed. Techniques previously applied to metals were now considered applicable to ceramic systems. Phase transformations, alloying, quenching and tempering techniques were applied to a range of ceramic systems. Significant improvements to the fracture toughness, ductility and impact resistance of ceramics were realised and thus the gap in physical properties between ceramics and metals began to close. More recent developments in non-oxide and tougher ceramics (e.g. nitride ceramics) have closed the gap even further.

1.3.2   The Link between Ceramics and Other Field of Study: The stages in ceramic production interlinks with some fields of study in terms of conceptualization of design, materials analysis and production process. The relationship of ceramics with fields of study such as Computer science, Chemistry, Geology, Engineering etcetera cannot be overemphasized as they have contributed immensely to technological advancement in present day craft based ceramics practice. For instance, the use of computer software such as CAD has served as a tool and has geared the intellectual instinct of ceramist in generating design. The chemistry behind forming techniques, including glaze chemistry, and the rapid prototyping (mass production) which involve the engineering aspect in production have all contributed greatly to advancing ceramic practices. This

study thus focuses on the inter relationship of the fields of Computer Science and Chemistry with Ceramics as they could promote speedy accomplishment of ceramic products in design approach, quality, quantity and uniformity towards technological advancement of ceramic practice in Nigeria.

2.0   Potential Areas of Interdisciplinary Contributions to Ceramics Development

2.1.   Design Conceptualization

Computer-Aided Design/Computer-Aided Manufacturing (CAD/CAM) is the application of computers in the design and manufacture of components used in the production of items such as automobiles and jet engines. CAD is software for creating precise engineering drawings while CAM adds a computer to a machine tool, such as a drill or a lathe. CAM Engineers similarly use computer modeling to determine the best overall manufacturing procedures for use in an industrial plant, including the testing and handling of finished products. Engineers use CAD and CAM together to create the design in CAD on one computer, and then transmit the design to a second computer that creates the part using CAM. (Grabowski, 2008)

In the design stage, drafting and computer graphics techniques are combined to produce models of objects. Designers manipulate and test these models on video display screens until they incorporate the best balance of features, including ease of production and cost. With the use of CAD/CAM in design approach, Adelabu (2010) remarked that ceramic designer could be able to define their products ideas from the initial design stage when the ideas are conceived to the production stage after the idea has been executed. More so, three Dimensional (3D) model are conveniently defined by drawing simple Two Dimensional (2D) curve, out of which complex free-formed shape are produced. Resembling the manual drafting convention, the product idea is defined from different views some of which denote profile shapes and the others define the surface cross-section shapes. With the way 3D CAD is made easy, most modeling interaction being concentrated in creative form is generated within the platform of the free-form. This potential has been expressed by Brendan Reid in creative development of a dead swallow bird using CAD model in geomatic studio and rendered with Rhino 4 software. See fig. 1, 2, 3, and 4.

2.2.   Creation of Model and Template

The use of computer graphic softwares has made a significant impact to generating template for prototyping ceramic product. Following the creation of a ceramic ware as requested by the client, the computer software like Corel Draw or Photoshop can easily be used to generate a 2D prototype of the ware to be produced as requested by the client by drawing simple curves which gives the true representation of ware to be produced. Computer design softwares have now made it easier for the ceramic designer to define their product ideas from the initial design stage when the idea is conceived, to the production stage when the idea is being executed. See Fig.5 & 6

The use of Corel Draw software was explored to generate a paper template that was used in the production of The Federal University of Technology, Akure logo which was mounted at the top of the University North gate. The software was used to generate the emblem to the precise size and shape of how the finished work would look like. The paper template of the logo was produced with computer graphic software to aid the manual processes of hand building the emblem in clay in order to achieve the actual size, shape and to save time of hand sketching. The use of this software has lessened the fatigue manual measurement of size and shapes which could be very cumbersome. See fig.7 & 8

2.3.   Glaze Composition

The advent of Computer application has also found its place in ceramic processes in the area of glaze formulation in recent time. Since the late 1970's various computer software packages such as Matrix by Lawrence Ewing, HyperGlaze by Richard Burkett, and Insight by Tony Hansen have

been developed internationally to assist ceramic students and practitioners in their glaze chemistry. Ewing (2009) as cited in Adelabu (2011) remarked that the use of computer application as made it possible for ceramists to approach glaze experimentation from an analytical point of view focusing on the chemistry of the raw materials as it affects the fired glaze.

Considering the significance of glaze to finished clay-based ceramic product finishing and towards advancement of glaze technology in Nigeria, Adelabu (2011) aimed at developing standardized indigenous glaze recipes based on raw materials in selected states of Nigeria, through the instrumentality of existing glaze software and was able to formulate new ceramic glaze recipes using established glaze recipes prepare with locally available raw materials in Nigeria. With the aid of the software, it is easier for ceramist to determine the melting temperature range, and the physical properties of the glaze formulated when run with the software.

The use of computer glaze software has assisted ceramists to facilitate the process of glaze calculation and improved the method of glaze formulation compare to traditional method of trial by error. See fig. 9

2.4. Body Composition and Glaze Composition

Ceramics are typically produced by the application of heat upon processed clays and other natural raw materials to form a rigid product. Ceramic products that use naturally occurring rocks and minerals as a starting material must undergo special processing in order to control purity, particle size, particle size distribution, and heterogeneity. These attributes play a big role in the final properties of the finished ceramic products. Chemically prepared powders also are used as starting materials for some ceramic products. These synthetic materials can be controlled to produce powders with precise chemical compositions and particle size. The next step is to form the ceramic particles into a desired shape. This is accomplished by the addition of water and/or additives such as binders, followed by a shape forming process. Some of the most common forming methods for ceramics include extrusion, slip casting, pressing, tape casting and injection molding.

After the particles are formed, the shape produce is called green wares. These "green" ceramics undergo a heat-treatment (called firing or sintering) to produce a rigid, finished product. Some ceramic products such as electrical insulators, dinnerware and tile may then undergo a glazing process. Some ceramics for advanced applications may undergo a machining and/or polishing step in order meet specific engineering design criteria. Some of the challenges that face ceramist in glaze composition include availability and cost of processed raw materials, quality control, quality and cost of labor which eventually affect the market value of their finished product compare to foreign ceramic products and allied products like aluminum, plastic etcetera.

The advent of chemical analysis makes it easier for ceramist to sample the materials that can be found within their reach in order to determine chemical composition of the materials and their viability for ceramic use. This would have reduced the cost of incurring processed raw material and well as the risk involve of loss in production due to trial by error method. Analytical Chemistry is one of the major branches of modern chemistry which is subdivided into two main areas namely, qualitative and quantitative analysis. The qualitative aspect involves the determination of unknown constituents of a material while the quantitative aspect concerns the determination of the relative amounts of such constituents. Thus, for example, determining whether a sample of Feldspar contains the compound of potassium oxide is a qualitative analysis and measuring the percentage by weight of potassium oxide present in the sample is a quantitative analysis.

Most potters or ceramics do neglect the aspect of material analyses and processing which invariably determine the final outcome of their products. Many of them rely on the physical and tactile quality a material to judge their physical and chemical properties which at the end failed them.

A studio experiment carried out by Ogunsusi, 2012 countered the idea of using physical and tactile property to judge the efficacy of any materials which is commonly used by major ceramist. Three different samples of kaolin which were sourced from Ifon, Akure and Omifunfun all in Ondo State were subjected to chemical analysis using X-Ray Fluorescence (XRF) to determing the iron content of the kaolin in formulating a suitable body for insulating refractory bricks which was used in construction of a testing kiln. The results of the analyses were given in tables i, ii, iii, and iv below.

Table 1. XRF Analysis Result for Akure

Elements	Conc. Value	Conc. Error	Unit
K	9860	± 464	ppm
Ca	2.4785	± 0.2730	Wt.%
Cr	983	± 37	ppm
Ti	5242	± 57	ppm
Mn	257	± 8	ppm
Fe	5.0627	± 0.213	Wt.%
Ni	354	± 15	ppm
Zn	327	± 11	ppm

Sourced: Ogunsusi 2012

Table 2. XRF Analysis Result for Omifunfun KAOLIN- C2034

Elements	Conc. Value	Conc. Error	Unit
K	1.1943	± 0.0513	Wt.%
Ca	1.2566	± 0.1966	Wt.%
Cr	1002	± 40	ppm
Ti	2574	± 38	ppm
Mn	90	± 5	ppm
Fe	2.9363	± 0.0162	Wt.%
Ni	372	± 16	ppm
Zn	308	± 12	ppm

Sourced: Ogunsusi 2012

Table 3. XRF Analysis Result for Ifon KAOLIN- A2034

Elements	Conc. Value	Conc. Error	Unit
K	6567	± 378	ppm
Ca	2.4914	± 0.2794	Wt.%
Cr	421	± 18	ppm
Ti	2369	± 38	ppm
Mn	89	± 5	ppm
Fe	1.7347	± 0.0131	Wt.%
Ni	355	± 12	ppm
Zn	163	± 6	ppm

Sourced: Ogunsusi 2012

Table 4. Linear Shrinkage Results

Samples	Wet length (cm)	Fired length (cm)
Akure	14	12.4
Ifon	14	13.1
Omifunfun	14	10.8

Sourced: Ogunsusi 2012

The result of the analysis proved that Ifon kaolin contain less iron oxide and impurities compare to kaolin sourced from omifunfun and Akure despite the fact that the kaolin sourced from Akure was the whitest of all the kaolin in appearance. Moreover, the linear shrinkage result conducted on the samples proved that Ifon kaolin has the less shrinkage level compare kaolin from other sources.

Thus, it is essential for ceramist analyze their raw material before use. This would enable them to discover the potential of their materials.

3.0. Recommendation and Conclusion

The new trend of technological development in the field of ceramic in Europe and Asia countries had greatly benefited from interdisciplinary approach. This has brought about innovation on design, preparation and production of ceramic product. However, the technique and production process of ceramic products in Nigeria are still crude and crafty. It is high time for ceramic practices Institutions in Nigeria to embrace the interdisciplinary approach by introducing a computer aided Design synopsis in their curriculum to develop students' creativity skill.

Students should be enlightened on the need to carry out a chemical analysis on their raw materials within their reach that is being used for production; judging raw material based on their physical properties alone should be discourage, especially in glaze body composition.

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The Fabrication of Three Dimensional Art and Craft Artefacts through Virtual Digital Construction and Output: AHRC large research grant. Sourced from *http: 3Dahrc_ Fabrication ceramics*
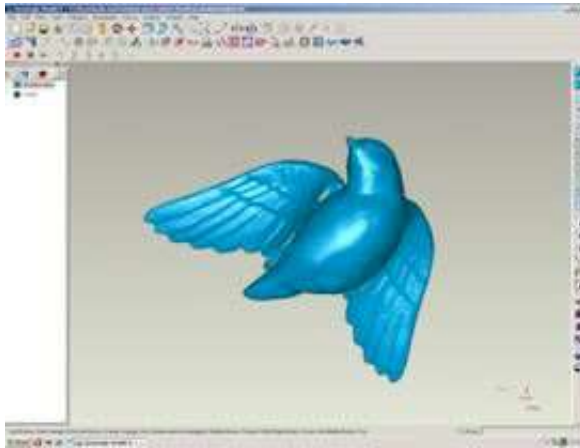
Appendix

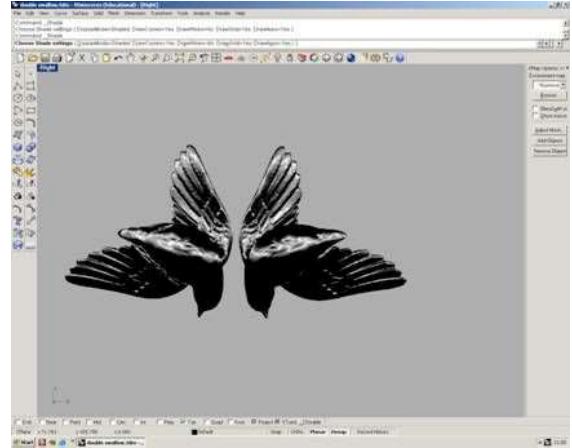*Fig. 1:Finished CAD model in Geomagic Studio*   *Fig. 2 : Final concept rendered in Rhino 4*

Fig.3 Dead Swallows in the kiln before glazing
Source: http: 3Dahrc_ Fabrication ceramics

Fig.4: Fired and glazed 3D ceramic Dead Swallows
Source: http: 3Dahrc_ Fabrication ceramics

Fig 5. A 3-D Model of the Test Kiln   *Fig 6. Test Kiln After completion*

Source: Ogunsusi, 2012

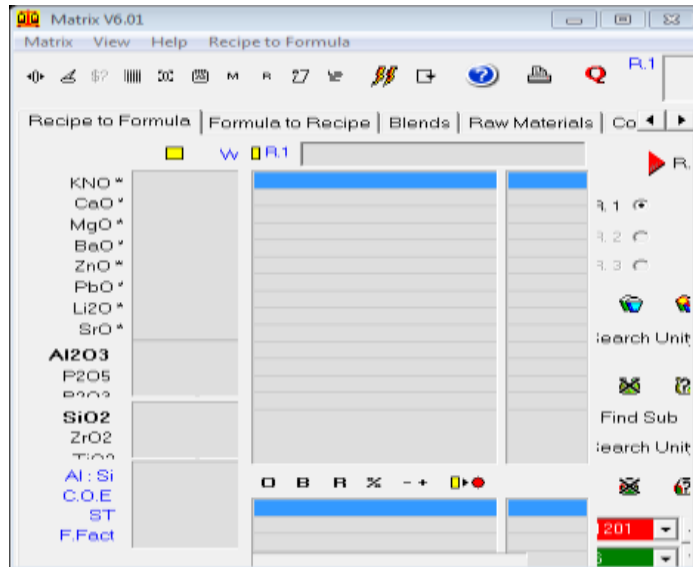*Fig 7. Model Produced from Computer Designed template*   *Fig 8. Finished FUTA Logo*

Fig 9. Matrix software authored by Lawrence Ewing
Source: Adelabu 2011