SCOTTISH JOURNAL OF
ARTS, SOCIAL SCIENCES
AND
SCIENTIFIC STUDIES

VOLUME 15, ISSUE II
September, 2013

Articles

Empowering Women through Continuing Higher Education Programme: A Panacea for Financial Freedom in Developing Country ............................................................... 3
Omoniyi, Mary Banke Iyabo (Ph.D).................................................................................. 3
Olugbemi, Kikelomo Victoria.............................................................................................. 3

Freedom in Margaret Atwood’s Novel the Handmaid’s Tale ........................................... 14
Cheong Pui Yin ................................................................................................................. 14
Wan Roselezam Wan Yahya .............................................................................................. 14

The Relationship between the Incidence of Fraud and CAMEL Ratings of Banks in Nigeria ....................................................................................................................... 27
Agbo J. C. Onu PhD........................................................................................................ 27

Growth Alterations by Water Soluble Fraction of Crude Oil in Fry of Cat fish (Clarias gariepinus) .................................................................................................................. 41
J.I, Izegaegbe, .................................................................................................................. 41
F. F, Oloye......................................................................................................................... 41
E.M, Obuotor...................................................................................................................... 41
V.F, Olaleye....................................................................................................................... 41

Between Primitive Hut and Large Scale Housing, the Presence of Utopia in Architecture ............................................................................................................................... 47
Eva-Maria Seng.................................................................................................................. 47

Antecedent and Development of Adire in Southwestern Nigeria ........................................ 67
Margaret, Olugbemisola Areo (Ph.D) ........................................................................................................ 67

Abstract of the measurement system „Ionospektroskop ©“ ........................................................................ 79

Dr. Rer. Nat. Dietrich Ewert ...................................................................................................................... 79

M. Sc. Hui Tang ........................................................................................................................................ 79

M. Sc. Mohammed Matalqah .................................................................................................................... 79

Dipl.-Ing. (TU) Thorsten Becher ................................................................................................................. 79

Gender Dimensions of Street Children in Ibadan, Nigeria ........................................................................ 89

Ogunkan D.V. ........................................................................................................................................... 89

A.T. Adeboyejo ........................................................................................................................................... 89

Ensuring continuity and credibility of research through audit trail: Guidelines and examples from case studies ........................................................................................................................................ 102

Susan Thomas .......................................................................................................................................... 102

Loo-See Beh .............................................................................................................................................. 102

Effects of Mathematical Modelling on Word Problem Solving and Achievement of Students in Mathematics in Jos South ........................................................................................................................................... 118

Dr. Thomas D. Bot .................................................................................................................................. 118

International EFL postgraduates’ English speaking experience through intercultural communication ................................................................................................................................................... 130

Li Ying ....................................................................................................................................................... 130

Mohammad Attaran .................................................................................................................................. 130

Chin Hai Leng .......................................................................................................................................... 130
Empowering Women through Continuing Higher Education Programe: A Panacea for Financial Freedom in Developing Country.

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Abstract
Women across the world face many challenges, but it’s hard to ignore the crippling effect that lack of education can have on their daily lives. The continent of African as a whole seems to be facing more challenges than other continents. These range from educating its population to economic development. However, due to many western developmental programs such as the Structural Adjustment Programs (SAPs), the Africa Growth and Opportunity Agreement (AGOA) and the recent trend in globalization, many African governments including Nigeria have not successfully addressed the needs of their women population including education. The “one size fits all” policy that characterize the conditions placed on African nations by international lenders such as World Bank and the International Monetary Fund (IMF) has generated educational policies that are geared towards assisting those already educationally advantaged to the neglect of the women education. In order to address these issues, African governments need to look into their peculiar problems, especially acknowledging that gender gap actually exists. They must come to terms with the tremendous outcome of women education: reduction in the number of women living in poverty, reduce infant mortality rate and improved quality of family life among others. These outcomes will foster economic development, social well being and eventually result in sustainable economic development. This paper is aimed at contextualizing the importance of empowering women through continuing higher education programs in African nations as a panacea for financial freedom and better quality of life. The counseling implication was also highlighted to educate African men folk to see women education as complimentary to their efforts rather than rivalry.

Key Words: Empowerment Women, Continuing Higher Education, Financial Freedom and Counseling Implication.
Introduction:

African women have always been active in agriculture, trade and other economic pursuits, but a majority of them do not have access to formal education and are therefore in the informal labour force. African women are guardians to their children’s welfare and most of the time have explicit responsibility to provide for them materially. They are the household managers, providing food, nutrition, water, health and family planning to an extent greater than elsewhere in the world.

The issue of women empowerment seems to be a global concern and access to quality education has been at the root of women empowerment. The increasing cost of education coupled with widespread poverty in Africa has restricted the opportunity for women education. Culturally, women are perceived as having lower social status than men and thus have further worsened their opportunity and consideration for education. The inadequate resource situation in the nation does not help the matter because funding of education has become a huge problem for governments as they can no longer meet the financial obligations.

Nigeria as a nation’s for example, has adopted education as an instrument for social and economic transformation. It was spelt out in the Federal Republic of Nigeria (2004), National Policy on Education that every Nigeria child shall have a right to equal educational opportunities. The efforts of Nigeria government have not yielded significant positive results on girls and women education. Onuebunwa (2008) observed that fewer girls than boys go to school and moreover, female enrolment dwindles as they move up the educational hierarchy. Female education affects family health and nutrition, agricultural productivity, and fertility, yet in African there is a wide gender gap in education. Lack of education, resources and pressures on time and energies put enormous constraints on the ability of women to maintain their own health and nutrition as well as that of their children. As a result, women are less well equipped than men to take advantage of the better income-earning opportunities that have emerged in Africa. Although food and nutrition are women’s prime concerns in Africa and they are the principal participants in agriculture, independent farming by women has been relatively neglected. Women family labour contribution has increased but goes unpaid. Women often suffer employment discrimination because they need to take time off for maternity leave or when a child is sick. Career women often have to work harder at their job to keep even with their male counter parts because of their household chores and others family commitments.

Despite all these obstacles women need to continue to be more education, move into different professions, including those traditionally seen as male jobs such as Engineering and architecture if our nation hope to compete with other technologically advanced countries of the world. The social attitude to women in most African countries is responsible for the gender differences in both the educational system and the labour force. This differential access to educational and training opportunities has led to low proportions of women in formal sector and their subsequent concentration in low paid jobs with limited career prospects. Although women play an important role in African society, they suffer education, economic and social constrains. There seems to be a lack of genuine political will to ensure that girls are given equal access to education in African. As observed by Obbe (2011), more than two-thirds of African illiterates are women. Women are regarded as inferior to men and are not expected to aspire as high as men. It is largely assumed that educating women would make them too independent. In other words, they would not do what they are expected to do –look after the house bring up children, and cater for their husband’s needs. When families face economic problems they prefer to invest their limited resources in the education of boys rather than provide what is considered prestigious education for girls who would eventually marry and abandon their professions anyway. Even when parents can be persuaded of the value of sending their girls to school, there remains the problem of helping the girls to complete their studies. Apart from this, the issues of early marriage and pregnancies are still with us in African. Very few schools
allow pregnant girls and young mothers to complete their education before they are expelled from the schools and women also show some differences (see table 1) Although the number of females who have been continuing on to seconding school level in African has increased, and the gap between male and female enrolments is narrowing, the number of women continuing to tertiary education has been minimal.

Table 1 male and female enrolment ration by level of education in 1999 and 2009 (% estimates)

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th></th>
<th>2009</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First Level</td>
<td>Second Level</td>
<td>Third Level</td>
<td>First Level</td>
</tr>
<tr>
<td></td>
<td>Male Female</td>
<td>Male Female</td>
<td>Male Female</td>
<td>Male Female</td>
</tr>
<tr>
<td>Sub-saharan African</td>
<td>56.7 36.0</td>
<td>9.9 4.4</td>
<td>0.8 0.2</td>
<td>73.5 59.9</td>
</tr>
<tr>
<td>Arab State</td>
<td>77.9 46.4</td>
<td>28.1 12.5</td>
<td>6.3 2.0</td>
<td>92.3 74.2</td>
</tr>
<tr>
<td>Latin American and Caribbean</td>
<td>91.9 89.4</td>
<td>26.3 24.6</td>
<td>8.0 4.5</td>
<td>111.4 107.2</td>
</tr>
<tr>
<td>East Asia</td>
<td>107.9 94.5</td>
<td>33.1 23.6</td>
<td>1.6 1.1</td>
<td>124.6 114.9</td>
</tr>
<tr>
<td>South Asia</td>
<td>87.1 53.2</td>
<td>30.7 13.1</td>
<td>7.4 2.2</td>
<td>100.8 75.1</td>
</tr>
<tr>
<td>North American</td>
<td>103.5 102.8</td>
<td>92.6 93.6</td>
<td>52.8 37.8</td>
<td>103.0 101.4</td>
</tr>
</tbody>
</table>

Source: UNESCO 2011: p.53

Classes (2008) observed that few employees is modern economic sectors in Africa are women and their participation is linked to their level of education. In the same vein, nine Africa Leigh – Doyle (2009) in his study of polytechnic observed that there are very few female staff and students in many of the African polytechnics (Table II and III).

Table II student enrolment in selected polytechnic in nine African counties. 2009.

<table>
<thead>
<tr>
<th></th>
<th>All programmes</th>
<th>Technical Programmes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Student</td>
<td>% Female</td>
</tr>
<tr>
<td>Yaba Collage of Technology, Nigeria</td>
<td>8,510</td>
<td>25</td>
</tr>
<tr>
<td>Kenya Polytechnic, Nairobi</td>
<td>3,488</td>
<td>24</td>
</tr>
<tr>
<td>Accra Polytechnic, Ghana</td>
<td>2,498</td>
<td>30</td>
</tr>
<tr>
<td>Malawi Polytechnic</td>
<td>1,033</td>
<td>14</td>
</tr>
<tr>
<td>Dares salaam Technical Collage, Tanzania</td>
<td>955</td>
<td>7</td>
</tr>
<tr>
<td>Botswana Technical</td>
<td>621</td>
<td>5</td>
</tr>
<tr>
<td>Uganda Polytechnic</td>
<td>566</td>
<td>9</td>
</tr>
<tr>
<td>Technical Training Institute, The Gambia</td>
<td>532</td>
<td>40</td>
</tr>
<tr>
<td>Northern Technical College, Zambia</td>
<td>1995</td>
<td>2</td>
</tr>
</tbody>
</table>

Table III Distribution of staff in selected polytechnics in eight African Counties, 2009

<table>
<thead>
<tr>
<th>Polytechnic</th>
<th>All Programmes</th>
<th>Technical Programmes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Student</td>
<td>% Female</td>
</tr>
<tr>
<td>Yaba Collage of Technology, Nigeria</td>
<td>284</td>
<td>19</td>
</tr>
<tr>
<td>Kenya Polytechnic, Nairobi</td>
<td>270</td>
<td>22</td>
</tr>
<tr>
<td>Malawi Polytechnic</td>
<td>117</td>
<td>12</td>
</tr>
<tr>
<td>Dares salaam Technical Collage, Tanzania</td>
<td>119</td>
<td>15</td>
</tr>
<tr>
<td>Botswana Technical</td>
<td>120</td>
<td>3</td>
</tr>
<tr>
<td>Uganda Polytechnic</td>
<td>100</td>
<td>3</td>
</tr>
<tr>
<td>Technical Training Institute, The Gambia</td>
<td>40</td>
<td>5</td>
</tr>
<tr>
<td>Northern Technical College, Zambia</td>
<td>58</td>
<td>2</td>
</tr>
</tbody>
</table>


The under –representation of women in education, training and employment need to be seriously addressed. This could be done through continuing education system so that more women can join the formal sector of the economy, acquire higher education and become professionals in their various field.

Education and Economic development

Education provides a foundation for eradicating poverty and fostering economic development. It is the groundwork on which much of economic and social well-being of the citizens is built. Education is the key to increasing economic efficiency and social consistency, by increasing the value and efficiency of the labour force and consequently raises the poor from poverty. Education increases the overall productivity and intellectual flexibility of the labour force and ensures that a country is competitive in world market now characterized by changing technologies and production methods.

According to Roberts (2011), the primary determinants of a nation’s standard of living is how well it succeeds in developing and utilizing the skills and knowledge, and furthering the health and educating the majority of its population.

No nation has achieved constant economic development without considerable investment in education and human capital (Ozturk, 2011) many researchers have shown handsome returns to various forms of human capital accumulation basic education, research, training and aptitude building (Denison, 2008, Bowman 2010).

Unequal education tends to have a negative impact on per capita income and thereby increase poverty in many countries. Educating girls and women is probably the single most effective investment a continent like Africa can make, whether or not women work outside the home. It creates a multitude of positive remunerations for families including better family health and nutrition, improved birth spacing lower infant and child mortality, and enhanced educational attainment of children. In order for a nation to be adequately integrated in world market for manufactured goods, and compete in these markets and in globalizing service markets will depend on the excellence of human capital they bring to the competition. Ensuring that all citizens are educated and numerate, that many possess a wide range of problem solving skills beyond the basic level, and that some have world class professional skill will be an advantage.

Education and Productivity

Clearly the educational provisions within any given nation represent one of the main determinants of the composition and growth of that nation’s output and exports and constitute an
important ingredient in a system’s capacity to borrow foreign technology effectively. For example: health and nutrition, and primary and secondary education all raise the productivity of workers, rural and urban; secondary education, including vocational, facilitates the acquisition of skills and managerial capacity; tertiary education supports the development of basic science, the appropriate selection of technology imports and the domestic adaptation and development of technologies; secondary and tertiary education also represent critical elements in the development of key institutions, of government, the law, and the financial system, among others, all essential for economic growth. Empirical evidence at both micro and macro levels further illuminates these relationships. At a micro level, numerous studies indicate that increases in earnings are associated with additional years of education, with the rate of return varying with high level of education (Behrman 1999 Psacharopoulos 1998). The returns to primary schooling tend to be greater than returns to secondary and tertiary education (Psacharopoulos, 2004).

In agriculture, evidence suggests positive effects of education on productivity among farmers using modern technologies, but less impact, as might be expected, among those using traditional methods. In Thailand, farmers with four or more years of schooling were three times more likely to adopt fertilizer and other modern inputs than less educated farmers (Birdsall, 2003). Similarly, in Nepal, the completion of at least seven years of schooling increased productivity in wheat by over a quarter, and in rice by 13% (Jamison and Moock, 2004). Education is also an important contributor to technological capability and technical change in industry. Statistical analysis of the clothing and engineering industries in Sri Lanka, showed that the skill and education levels of workers and entrepreneurs were positively related to the rate of technical change of the firm (Deraniyagal, 2005).

Education alone, of course cannot transform an economy. The quality and quality of investment, domestic and foreign, together with the overall policy environment, form the other important determinants of economic performance. Yet the level of human development has a fearing on these factors too. The quality of policy making and of investment decisions is bound to be influenced by the education of both policy makers and managers.

According to Lucas 2008, for example, the higher the level of education of the workforce the higher the overall productivity of capital because the more educated are more likely to innovate, and thus affect everyone’s productivity. This implies that increased education of individuals raises not only their own productivity but also that of others with whom they interact, so that total productivity increases as the average level of education rises (Perotti, 2008). The impact of education on the nature and growth of exports, which, in turn, affect the aggregate growth rate, is another way in which human development influences a country’s performance. The education and skills of a nation’s labor force influence the nature of its factor endowment and consequently the composition of its trade. It has been argued that even ‘unskilled’ workers in a modern factory normally need the literacy, numeracy, and discipline, which are acquired in primary and lower secondary school (Wood, 2009).

Education and Income

There is also a positive feedback from improved education to greater income equality, which, in turn, is likely to favour higher rates of growth. As education becomes more broadly based, low-income people are better able to seek out economic opportunities. For example, a study of the relation between schooling, income inequality and poverty in 18 countries of Latin America in the 1990s found that one quarter of the variation in workers’ incomes was accounted for by variations in schooling attainment; it concludes that ‘clearly education is the variable with the strongest impact on income equality’ (Psacharopoulos, 1998). Another study suggested that a one percent increase in the labor force with at least secondary education would increase the share of income of the bottom 40 and 60% by between 6 and 15% respectively (Bourguignon and Morrison, 2000).
An investigation of the determinants of income distribution in 36 countries found secondary enrolment rates to be significant (Bourguignon, 2005).

Education may affect per capita income growth via its impact on the denominator, i.e. population growth. For example, a study of fourteen African countries in the mid-nineties showed a negative correlation between female schooling and fertility in almost all countries, with primary education having a negative impact in about half the countries and no significant effects in the other half, while secondary education invariably reduced fertility (Wolfe 1995). The three success countries in terms of reduced fertility, Kenya, Botswana, and Zimbabwe, had the highest levels of female schooling as well as the lowest child mortality rates (Ainsworth, 1995).

**Human capital and the family: Education and the family**

The family is the foundation of a good society and of economic success. Families have differed over time, but they are still very important in the modern economy. To understand human capital, one has to go back to the family, because it is families that are concerned about their children and try, with whatever resources they have, to promote their children’s education and values. Families are the major promoters of values in any free society and even in not-so-free societies.

Families make a variety of decisions. One is whether to have many children or to have fewer children. Also some try to do more for each child. The trend shifts very strongly toward the latter as countries develop. Every nation that has developed has done that, some in remarkably short periods of time. Taiwan, for example, has a birth rate lower than the United States. Declining birth rates also characterize Hong Kong, Mexico, and Poland (Becker, 2008).

In the developed part of Turkey the average number of children that families have is lower than the less developed part of Turkey. This is related with the of education level of families. On average, educated families, particularly educated women, have 1.4 children and uneducated families have 5.1 children in the eastern region of Turkey (Baloglu, 1998). Thus, in order to reduce the birth rate and inequalities between these regions of Turkey, more importance may have to be given to education. Greater education of parents, perhaps of mothers, tends to improve the treatment of children, especially the daughters. The gap between the education of sons and daughters seems to be smaller when parents are educated. More educated men and women also tend to invest more in their own health and the health of their children. Indeed, education may be the single most important personal determinant of a person’s health and life expectancy.

According to Becker, (2008) the educated persons in the United States and other rich nations are the least likely to smoke. He observed that smoking in the United States is now found in significant numbers only among those with no college education, and is especially common among high school dropouts. The educated persons in Turkey are mostly working most of the time. The uneducated people not in work usually sit in cafes and waste their times. Many of them smoke (Baloglu, 1998).

Education of the poor helps improve their food intake not only by raising their incomes and spending on food but also by inducing them to make better, healthier, choices. Studies from different nations indicate that educated persons tend to consume a healthier diet even when the total amount spent on food is held constant (Behrman, 1999). Of course, the relation between education and better health and life expectancy involves causation in both directions, for greater health and lower mortality also induce larger investments in education and other human capital since rates of return on these investments are greater when the expected amount of working time is greater.
Education and Trade

Some countries have successfully combined openness and investment in learning and education, forming a virtuous circle; openness creates demand for education, and learning and education make a country’s export sector more competitive. Knowledge accumulation influences a country’s trade performance and competitiveness (Grossman and Helpman 1999), trade in turn, enhances knowledge accumulation, especially through imports (Ben, 2005).

Birdsall (2003) observed that a World Bank study found that economic growth rates in a sample of 60 developing countries during 1985-95 were especially high where there was a combination of a high level of education and macroeconomic stability and openness. The impact of trade openness on long-term growth thus depends on how well people are able to absorb and use the information and technology made available through trade and foreign investment. It seems to be widely accepted that in order to adapt to an environment of stronger competition and to a world emphasizing the role of information, knowledge and skills, and advanced economies, there is the need to continuously upgrade the overall quality of their labour force through education. This may assist to consequently their poverty or totally eradicate it giving them financial freedom.

Continuing higher education:

Continuing higher education or part-time programme is accentuated by the desire to acquire knowledge, skills and value that would enable the recipient cope with everyday changes in the environment or social milieu in which the individual finds herself or himself. According to Egunyomi (2009), higher continuing education seeks to build highly individualized and flexible programmes of learning and makes use of largely untapped resources for teaching and learning. It moves towards a new faith in the student and his capacity for learning on his or her own, while at the same time providing close and continuing contact between the students and teacher. Thus, continuing higher education can be viewed as a means of acquiring knowledge that will enable the individual keep up with the rapid social cultural, economic, political, industrial and technological changes taking place in the environment in which the individual finds himself (Olomukoro, 2005) continuing education is geared towards ensuring the continued relevance of the individuals in the society, the provision or access to education for all citizens. It is geared towards meeting the need of individual who seek to update his knowledge and feel he needs the education for his personal development. Thus, the idea of continuing higher education is to provide formal instruction to a large group of people who are generally more matured than students who are regard in colleges and whose studies are somewhat irregular and held at unconventional times and places (Egunyomi 2001). Over the decades, most African women have received some sort of informal education, but formal education, has been reserved for men who occupy the more important and elite roles in government and society. Although there has been a slow change over time, the change needs to be expedited, despite the cultural complexities of women situation in African. Continuing higher education is a sources of progress and development for women. Marriage had always been a terminal point for women education. Women rarely leave their homes for further studies because of the risk of loosing their homes and jobs. It was believed among educated African men that little education was sufficient for women just to make them literate. It was also believed that educated women would not be submissive to their husbands, and hence women education met with resistance in terms of financial and moral support from their husbands. Continuing education may bring succour to the women education and subsequent empowerment. Women can aspire to reach any level of education through these programmes.

Types of Continuing Higher Education Programmes in Nigeria

National Open University of Nigeria (NOUN): was established as a supplement and complement to traditional channels of delivering education to Nigerian public. The need for
continues higher education is imperative in view of the ever-increasing growth rate in Nigeria population and the high proportion of Nigerian under the age of 15 (about 51 per cent of the total) have produced the highest number of Nigerian to be educated (Jegede 2002) NOUN provides access to tertiary education through open distance learning ODL. In NOUN, the courses are organized for easy access, grasp, retention and retrieval. The programmes are made available to students at chosen places (e.g. home, school or workplace) at affordable costs and are to be completed at the students’ own and pace (Alaezi, 2006).

Nigeria’s Teachers’ Institute (NTI): Nigeria Teacher’s Institute’s the (NTT’s) pivotal teacher training programme was designed to produce teachers through open and distance learning ODL for the primary schools and junior secondary schools in Nigeria. NTI use self-instructional materials and weekend vacation contact sessions for tutorials, practical lessons and counseling. It has about 600 study centres country wide. Between 1990 and 1992, the NTI graduated 21, 000 Nigeria certificate in Education (NCE holders). This figure compare with the combined total of 58,000 teachers graduated by the nation’s 58 conventional colleges of education (Aderinoye, 2001). The NTI's pivotal teacher’s programme produced 19,025, 20,800; and 15,567 qualified teachers for year 2000, 2001 and 2002 respectively (Aderinoye, 2001).

Sandwich Programmes: They were established and run by tertiary instructions in Nigeria, most especially the universities and colleges of education. Sandwich programmes in Nigeria, dates back to the mid eighties. They are programmes that are run during the school vacations to create opportunities for working class. These programmes are made available to all categories of entry qualifications ranging from; school certificate attempted, school certificate holder, grade two teachers, Nigeria Certificate in Education (NCE) holders to degree holders. Many universities have been running the programmes from its inception in the mid eighties while some have withdrawn as a result of university management policies

Weekend/Part Time Programmes: They are run by some universities, Nigeria teacher Institute (NIT), and some polytechnics. These programmes were established and run to create opportunities for working class and young school leavers as a means of accessibility and opportunity to be educated and to improve on their level of education. In Nigeria today many senior secondary school certificate holders are now seeking admission into these weekend programmes. Indeed these programmes are grace saving devises for Nigeria government since the traditional school system cannot cope with the teeming population of potential students for tertiary institutions. Weekend studies have produce d holders of Degree in various disciplines, national Diploma (ND), Higher National Diploma (HND), Nigeria Certificate in Education (NCE), and Teacher Grade Two Certificate (TCII) in Nigeria.

Correspondence Learning: University of Lagos has established correspondence studies as far back as 1974. It was formerly referred to as the correspondence and open studies unit (COSU), but today it is redefined to produce university graduates in disciplines necessary to meet national labour need (e.g. teachers, nurse etc) Ahmadu Bello University (ABU) also established correspondence, and Teachers in-service programme (TISEP) in 1976 which offers special training programme to prepare middle level teachers for Nigeria’s primary schools (Aderinoye and Ojokheta 2004)

Distance learning Centers (DLC): Distance learning Centers (DLC) was established by the University of Ibadan’s senate in 19988, it was initially referred to as the External study programme (ESP), that later became the center for external studies (CES), and today is called Distance Learning Center (DLC). It was established to provide opportunities for teachers on the job to improve their skills and knowledge through no-the- job training. This in-service training enabled them to subsequently raise their status from holder of Nigeria certificate in Education (NCE) to full fledge university degree holders.
Continuing Higher Education (CHE): create opportunities for women education today to learn throughout life time education giving to a women is un-quantifiable, the spillover effect of women education on children, families, communities and the nation cannot be over-stressed. An educated woman is a better mother, wife, social mobilizer or citizen. It is worthy of note that despite the ample opportunities through continuing higher education programmes, there are still millions of women who are still illiterates due to ignorance, cultural hindrance and poverty in urban, rural and remote areas of the country. CHE would play significant roles in accelerating women education and subsequently women empowerment if adopted. It would created opportunities for women to squeeze time out to learn and further their education. It also created opportunities for women to up-grade their qualifications and skills at reasonable intervals (CHE) Continuing Higher Education is a veritable instrument in bringing social and economic transformation of women in Africa.

Counselling Implication: The cultural challenges encounter by Africa women can undoubtedly affect their attitudes towards learning. These challenges demand for a kind of intervention that would enable them maximums their potential in nation building counselors and other stakeholder are counselled to actually understudy the peculiar challenges of these women and the prevailing situations which may influence their attitude towards learning. This is very important because if there is a variance the real challenges and the perceived challenges by the counsellors and stakeholders, certainly it will be difficult to properly address them by designing appropriate counselling intervention programmes. Identification of these challenges will enable the counsellors to select appropriate counselling strategies such as behaviours modification rational emotive therapy strategies or any other strategies as the case may demand to help in solving these problems. Intervention programmes such as cognitive re-structuring many be put in place through mass media to help change the way African men view the women folk. The irrational believe of that women are just part of men’s acquired property who should be seen and not heard may be eradicated. It is counselled that the government should promote programmes focused on the importance of women education in nation building along with other propaganda that will disabuse the mind of men from seeing educated women as wanting to complete or overthrow the male counter parts. Rather they should see them as partners in progress. On the other hand, counsellors and other stakeholders should help the women rise up to their challenges in continuing their education. This can be done through guidance programmes in the mass media, which can be focused on helping the women to develop positive and assertive attitudes. These attitudes would help them not only to develop positive attitude towards learning, but acquire the desired interest, sustain it and cope with their learning challenges. It is counselled that intervention programmes on multiple role management be put in place. This would assist women to be aware that it is possible to perform many roles simultaneously without role conflict.

Conclusion: Recent global events should lead Africans to a shift in the marginalization of women and allow them to pursue meaningful educational programmes at all levels both in formal and non-formal settings. It is worthy of note that in Africa, women constitute a great asset in nation building and so, increasing women access to education will enable them develop their rich human potentials and maximums their contributions to nation building. Besides, as major home managers, having access to further education, will ensure better child care, reduced fertility and mortality rates, nutrition and better participation in trade and industry which would enhance national economic growth and release the continent from her present state of financial captivity into a lasting breeze of financial Freedom.
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Abstract

The two different eras in The Handmaid’s Tale can be seen and framed in terms of two opposing types of freedom that Isaiah Berlin proposed, i.e. negative and positive freedom. While one may automatically contend that the situation in the dystopian setting of the Gileadean era is worse than the pre-Gileadean, it is necessary for readers to study closely if this is the case. The individual freedom to choose during the pre-Gileadean era indicates that this freedom pertains mostly to an individual’s desire as opposed to the society at large. During the Gileadean era, on the other hand, freedom is seen as a form of collective decision, to curb individual desires to achieve ‘true’ freedom, as aspired to by the rigid, moral, social rules and regulations of a good citizen. Read in relation to Berlin’s idea of freedom, the results show the contrary, that the pre-Gileadean era practises negative freedom while during the Gileadean era positive freedom is exercised. This is an alarming result, especially when individual freedom seems to be valorised and upheld in a modern, pre-Gileadean society, while individual freedom is totally curbed in the traditional society of the Gileadean era. However, it is fair to conclude that Atwood is not in favour of one freedom type over the other because freedom may be viewed as being on a continuum, where there is a middle ground with a fair mix of negative and positive freedom, because one cannot exist without the other.

Keywords: Canadian literature, dystopia, freedom, Isaiah Berlin, liberty, utopia
Introduction

The conception of *The Handmaid’s Tale*, according to Margaret Atwood herself, was a humble one. It was conceived, simply, during dinner with a friend, not too long after the publication of *Bodily Harm* in 1981. As with most casual meet-ups between friends, Atwood and her companion, Harold Bloom (2004: 13), had conversed about “various things as we usually do, including some of the more absolutist pronouncements of right-wing religious fundamentalism” (ibid.), which then prompted one of them to exclaim how: “No one thinks about what it would be like to actually act it out.” This became Atwood’s cue to take the issue on, to “act it out” – fictionally. Following that, *The Handmaid’s Tale* appeared in 1985, to much critical acclaim, thus becoming one of Atwood’s more influential books during the course of her long career.

*The Handmaid’s Tale* has, ever since its publication, been labelled in many ways, categorised under many different genres, and inspected through the different lenses of many literary and scholarly theories. One of the most prominent labels that the text has been tagged with is the feminist label. Deery (1997), for instance, examined the text in terms of the female body, thus constructing a scientific feminist reading of the novel. Hansot (1994), on the other hand, investigates it from the perspective of a dystopian novel when she talks about selves, survival and resistance in her article. Yet others took the liberty to combine the labels of both feminist novel and dystopian novel to call Atwood’s work a distinctive feminist dystopian novel, such as was done by Stillman and Johnson (1994: 70), as indicated when they commented that, “Atwood also joins the ranks of the writers of specifically feminist utopias and dystopias.” Both Bloom (2004) and Keifer-Boyd (2006), on the contrary, went further and referred to *The Handmaid’s Tale* as gothic and speculative fiction, while Wan Yahya and Chin (2013) examined the novel as if it were science fiction.

Each of these approaches provides literary scholars with multiple ways of interpreting the text, all relevant in their own right, and there is little doubt that there will be more to come. This paper may well be one of those ‘more to comes’, proposing that we move away from the current, prevalent views and take a look at the novel from a social science perspective instead, specifically in relation to the idea of freedom within *The Handmaid’s Tale*.

It would hardly be erroneous to claim that freedom is one of the major themes found within Atwood’s text, perhaps even the core of the story. This is evidenced by the numerous allusions to it that we find peppered within the text, through both direct mentions and indirect actions. Perhaps one of the more memorable ones that was made with regard to the issue was articulated by Aunt Lydia (a major character in *The Handmaid’s Tale*) when she declared that, “[t]here is more than one kind of freedom … Freedom from and freedom to. In the days of anarchy, it was freedom to. Now you are being given freedom from. Don’t underrate it” (Atwood 1998: 24).

Thus one must question what are these notions of ‘freedom from’ and ‘freedom to’ that Aunt Lydia lectures the Handmaids about. While it is true that it makes sense syntactically (‘freedom from’ and ‘freedom to’ certainly make sense in a different way, denotative-wise), what makes one better than the other? Why should Offred and her kind be grateful for one over the other? How do these notions of freedom define their lives? These are questions that remain largely unanswered in the text. For this purpose, then, this paper seeks to examine solely this concept of freedom for what it is, as well as the way in which it is manipulated within the novel, particularly in terms of how people before and after Gilead have come to view it. More precisely, it intends to define how ‘freedom from’ and ‘freedom to’ have impacted on the politics of the government of the Gilead regime and its people.

The theory that this paper has opted to use as its foundation and guiding philosophy is Isaiah Berlin’s concept of negative and positive freedom (2002). As is customary with most theory-based literary papers, this paper will first begin with an explication of the theory before bringing it into context by applying it to the text. This paper adopts Berlin’s stand of not distinguishing between the
concepts of ‘freedom’ and ‘liberty’; as such, any following encounters with the word ‘liberty’ in later parts of the essay should be regarded in the same light.¹

Isaiah Berlin’s Theory of Negative/Positive Freedom

When one refers to the concept of freedom in this day and age, conventional society does not treat it in too complicated a manner, and would commonly understand it as being nothing more than a situation where one is allowed, i.e. not hindered, to do the things that one wants to do. Indeed, to put things into perspective as to how the public, by and large, understand freedom, there is a need to look at the dictionary definitions given to this concept/word, because dictionaries are the usual, common source of information that most people will generally turn to when they do not understand a certain word.

The older Chambers Twentieth Century Dictionary (1959: 421) defines freedom from a particularly wide range of aspects: “liberty: frankness: outspokenness: unhampered boldness: separation: privileges connected with a city (often granted as an honour merely): improper familiarity: licence”. Of the many definitions given, most relevant to the case of this essay are these: “unhampered boldness”, “privileges connected with a city” and “licence”. As we can see, these descriptions of freedom carry the meaning of ‘being allowed to do the things that one wants to do’.

The more contemporary Oxford Advanced Learner’s English-Chinese Dictionary (2004: 697), on the other hand, has four entries for the word “freedom”. The first entry describes freedom as “the right to do or say what you want without anyone stopping you”, while the second gives “the state of being able to do what you want, without anything stopping you”. The third and fourth describe “the state of not being a prisoner or slave” and “the state of not being affected by the thing mentioned”, respectively (2004: 697).

Looking at and comparing the entries from both the older Chambers and the more up-to-date Oxford Advanced Learner’s dictionaries, we can clearly discern that little has changed in society’s understanding of freedom. As defined here, freedom is a one-dimensional concept that carries only one meaning: permission to perform as one desires to do. Isaiah Berlin, however, challenges this view by introducing the idea that freedom is not a one-dimensional notion. Rather, there are, like many other abstract issues and concerns, two (or more) views of the matter. Thus, he brings in the idea of what he calls negative and positive freedom, as two contrasting ways of looking at liberty as a philosophical subject: two sides to a coin, according to Berlin. In time, however, these two ‘types’ of freedom subsequently acquire another moniker for themselves: ‘freedom from’ and ‘freedom to’, respectively.

Thus, we begin to see a link to how Berlin’s theory of negative and positive freedom is applicable to Atwood’s The Handmaid’s Tale. Regardless of whether Atwood knowingly or unknowingly weaved Berlin’s theory into her work, it remains a fact that she had made reference to it, and thus we can now begin, perhaps, to gain a little insight into what Aunt Lydia may have meant as well as to how freedom was ‘packaged’ in Gileadean times.

To ease into an understanding of Berlin’s theory, we start by looking at what negative and positive freedom are, and then examine how they are different from one another. In Berlin’s famous essay, ‘Two Concepts of Liberty’, first published in 1985, he opens the discussion by defining negative freedom as the notion that it “is involved in the answer to the question ‘What is the area within which the subject – a person or group of persons – is or should be left to do or be, what he is able to do or be, without interference by other persons?’” (Berlin, 2002: 169). He follows this by adding that positive freedom is an “answer[s] to the question ‘What, or who, is the source of control or interference that can determine someone to do, or be, this rather than that?’” (Berlin, 2002: 169). In other words, Berlin is suggesting that negative freedom is more concerned with the area or things

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that one is free to do or be, whereas positive freedom focuses on the person(s) who determine(s) one’s freedom.

Carter (2003) tries to simplify Berlin’s statement by linking the type of freedom to the notion that it represents. He says that “[t]he reason for using these labels is that in the … case [of negative] liberty [there] seems to be a mere absence of something (i.e. of obstacles, barriers, constraints or interference from others), whereas in the … case [of positive liberty] it seems to require the presence of something (i.e. of control, self-mastery, self-determination or self-realization)” (emphasis in the original) (Positive and Negative Freedom).

Carter (2003) also offers another way of understanding negative and positive freedom. He attempts to explain the two sides of freedom through the idea of the factors that influence the agent. Negative freedom, he claims, is often associated with external factors, such as external influences and interference that affects a person. Positive freedom, on the other hand, concerns itself with the internal factors that affect the agent’s actions and ability to conduct himself or herself.

Brennan (2010), too, recognises the role that external and internal factors play in the concept of negative and positive freedom, except that he phrases it in the discourse of power. He says that “[w]e can define ‘freedom’ as a power to do what is right, free from all temptation to do otherwise” (Brennan, 2010:12). By phrasing it so, Brennan admits that “there are internal as well as external impediments to freedom”, for the notion of ‘temptation’ is hardly only ever confined as an external obstacle; most temptations are often understood as the struggling between oneself and one’s own desires.

More important, however, is the fact that Brennan also introduced the idea of morality through this discourse of power and temptation. The notion of morality is one of the many disparities that Berlin quotes as an important distinction between negative and positive freedom, particularly in the way both types of freedom frame the idea of people’s desires. Bringing the issue of morality into the issue of negative/positive freedom forces this question: In the face of all the desires/temptations that one faces, both external and internal, do we have the “power to do what is right, unimpeaded by contrary desire” (Brennan, 2010: 12). Even more importantly, what does one mean by ‘doing what is right’, i.e. to be morally upright?

Berlin, who appears to favour negative freedom more than positive freedom, claims that negative freedom permits the employment of a more ‘personalised’ form of human desire than that of positive freedom. He vehemently says that within the concept of negative freedom, “the self that should not be interfered with is no longer the individual with his usual wishes and needs as they are normally conceived, but the ‘real’ man within, identified with the pursuit of some ideal purposes not dreamed of by his empirical self” (Berlin, 2002: 181).

In other words, negative freedom is the type of freedom that is dependent on our own choices for our own sake instead of for some ‘ideal purposes’ that must always consider the good of other people. It is only concerned with the idea of removing the obstacles and restraints that lie in one’s way to his or her ultimate goal: freedom of choice to do as one desires. The more liberty one gets in terms of his or her choices, the more powerful he or she is; the more choices one gets, the freer he or she is – such is the foundation of negative freedom. There is little need to worry about the morality of these choices, such as if a person’s choice will benefit or help those people around them. As long as they do not hurt others in executing their individual freedom of choice, they do not have to worry about helping society.

Positive freedom, in contrast, deals with a self that acts as “this entity [that] may”, Berlin claims, “be inflated into some super-personal entity – a state, a class, a nation, or the march of history itself, regarded as a more ‘real’ subject of attributes than the empirical self” (Berlin, 2002: 181). Instead of being linked to the realisation of individualistic, personal desires, positive freedom
requires one to make the right choice. Thus, it does not allow one to do as we like, but rather, to do as we should do if we desire to be free. It is little wonder, then, that positive freedom is less favourable in Berlin’s eyes; if one submits to the view of positive freedom, he or she is compelled to a certain moral obligation, which may sometimes swell into an immense array of responsibilities.

To better illuminate this situation, there is a need to refer to Berlin’s mention of ‘higher’ and ‘lower’ nature in his essay. Berlin proposes that, within everyone, there are two selves: the dominant self and the dominated self. He goes on to explain that “[t]his dominant self is … identified with reason, with my ‘higher nature’, with the self which calculates and aims at what will satisfy it in the long run, with my ‘real’, or ‘ideal’ or ‘autonomous’ self, or with myself ‘at its best’” (Berlin, 2002: 179). The dominated self is, of course, everything opposite; it is “contrasted with irrational impulse, uncontrolled desires, my ‘lower’ nature, the pursuit of immediate pleasures, my ‘empirical’ or ‘heteronomous’ self, swept by every gust of desire and passion, needing to be rigidly disciplined if it is ever to rise to the full height of its ‘real’ nature” (Berlin, 2002: 179). This goes on to mean that the ‘higher’ self carries the responsibility for ‘disciplining’ the ‘lower’ self in order to help it attain its ‘real’ nature.

Put that way, this dichotomy of ‘higher’ and ‘lower’ selves may operate quite nicely within a larger social context, such as that of a tribe, a race or a nation. Within a social community, then, there will be individuals who are considered to be ‘higher selves’ whereas the others remain ‘lower selves’. Thus, to obtain positive freedom, the ‘higher-self’ individuals must bear the obligation of disciplining, teaching and guiding the ‘lower-self’ individuals. They must “impose its [the society’s] collective, or ‘organic’, single will” (Berlin, 2002:179) upon the ‘lower self’ individuals, i.e. dictate to them what they must or must not do, so that they may improve for their own sake.

It is precisely this restrictive imposition of ‘collective, single will’ that made Berlin questions the benefits of positive freedom. If positive freedom means the inflicting of society’s will upon individuals, then what is personal freedom? If positive freedom means forcing duties and commitments upon individuals without asking for their consent, even if it is for their own sake, then is that particular society an authoritarian, totalitarian society?

From the above elucidation, then, we can deduce that there is yet another difference between negative freedom and positive freedom, and that it lies in the way both ‘types’ of freedom locate their idea of liberty.

In basing their idea and amount of liberty on the act of choosing and the choices given to people, advocators of negative freedom have, in effect, framed their type of freedom as “a source of value’ rather than a means to something else” (Putterman, 2006: 418). Choice is what offers a person freedom, and so it becomes a source. Positive freedom, on the other hand, views liberty in exactly the reverse manner. Liberty, to those who uphold the ideology of positive freedom, is an end – a result that is only achievable from their actions and deeds. Putterman (2006:418) puts it this way: “Positive freedom is valued by its proponents because of what it enables them to achieve, be it justice, knowledge, wisdom the list of ends has no conceivable end even freedom itself.”

As a result of this differing view of liberty itself, negative and positive freedom are also set in opposition in terms of the way both ‘types’ of freedom view the issue of consequences. To put it simply, advocators of negative freedom have less of a fixation with this issue than those who believe in positive freedom. This is largely due to the focus that they place on the things that constitute freedom. Due to the fact that negative freedom is more concerned with liberty as a ‘source’ instead of an ‘end’, the consequences of an individual’s actions are given less emphasis by the proponents of negative freedom. This, however, is not the only reason why supporters of negative freedom prefer not to take consequences into account. Their reluctance to pay attention to the consequences of one’s
actions also stems from a very rational line of thought: the more one factors in the consequences of one’s action, the more likely he or she will be inclined to limit his or her individual freedom/choices.

Along the same lines of rationalisation, then, it is comprehensible why consequences matter so much to those who are in support of positive freedom. Unlike negative freedom, positive freedom aligns its representation of freedom with the consequences of an individual’s actions. Thus, one must always think twice before he or she takes an action lest it tamper with the desired consequences.

A final difference between negative and positive freedom that will be discussed in this paper is the function that both ‘types’ of freedom carry. Putterman (2006:439) puts it most succinctly when he says that “[p]ositive freedom not only proscribes – which negative freedom does too – it also prescribes”. In other words, both negative and positive freedom do ban or condemn certain actions or deeds, but only positive freedom will set down and impose ‘rules’, to a certain extent, to limit the amount of liberty allowed to their subscribers. This need stems directly from the need for ‘higher-self’ individuals to discipline ‘lower-self’ individuals in order to help them improve and achieve their ‘real’ aim in life.

Having said that, it must be mentioned that the explications discussed here are not the only distinctions that divide negative and positive freedom that are provided by Berlin (and many other proponents of both negative and positive freedom). The reason why we have opted to look at only these five distinctions (negative and positive freedom with regard to (a) an individual’s desire, (b) the issue of morality, (c) the way freedom is located, (d) the way they view consequences, and (e) the role that they carry) is because these five issues are the ones that I intend to bring up for examination in Atwood’s *The Handmaid’s Tale*.

**The Theory of Negative/Positive Freedom in The Handmaid’s Tale**

Having taken quite an in-depth look at Berlin’s theory of negative and positive freedom, we can now draw parallels between the theory and how it is fleshed out in Atwood’s novel. As mentioned earlier in the introduction to this essay, Aunt Lydia makes references to negative and positive freedom when she says that “[t]here is more than one kind of freedom … Freedom from and freedom to. In the days of anarchy, it was freedom to. Now you are being given freedom from…” (Atwood, 1998: 24). It is possible, then, for us to begin by reviewing the situation from Aunt Lydia’s pivotal labelling of periods in the text (pivotal because without her distinguishing of the periods, i.e. discerning pre-Gileadean times as a period of ‘freedom to’ and Gileadean times as ‘freedom from’, it would have been difficult to find a constant point of reference).

In this section, this paper will begin by drawing out the characteristics of the freedom practised during pre-Gileadean and Gileadean times, and then it will compare the circumstances to Berlin’s concept of negative and positive freedom, as well as Aunt Lydia’s labelling of ‘freedom from’ and ‘freedom to’, for validation purposes.

**Freedom During Pre-Gileadean Times**

Atwood was not specific about the time frame of her novel, except for the final chapter where it mentions that the Twelfth Symposium on Gileadean Studies, where the ‘Historical Notes on The Handmaid’s Tale’ will be presented, is being held in the year 2195 at the University of Denay, Nunavit. Based on observations of a few different incidents that are mentioned in the novel, however, it is possible to locate the events in *The Handmaid’s Tale* in the general years of the late 20th century, most probably after the 1960s.

One of the more obvious clues that points to this assumption is the mention of feminist demonstrations that Offred’s mother had taken part in, where she marched for the “FREEDOM TO CHOOSE. EVERY BABY A WANTED BABY. RECAPTURE OUR BODIES…” (Atwood, 1998:120). The demonstration, obviously, is one that is associated with women’s rights, but it is not just any
women’s rights, for the phrase ‘EVERY BABY A WANTED BABY’ indicates that this is a demonstration that asks for reproductive rights.

Within the timeline of a feminism war, experts have acknowledged the existence of three waves of feminist activities. The first wave of feminism was generally concerned with overcoming obstacles to gender equality, such as voting rights, whereas the second wave of extended its issues to include such topics as sexuality, family and reproductive rights. The third wave of feminism, however, fights for various differing racial and class identities, as well as nationality, which exist within women themselves (Topics in Feminism). Thus, we can safely say that the demonstration in which Offred’s mother partook was one that happened during the second wave of the feminist movement, which then allows us to locate the time frame of this text to the late 1960s or early 1970s. Further, more accurate proof lies in several carvings that Offred encounters on a desk in the Rachel and Leah Center (also called the Red Center): “On the top of my desk there are initials, carved into the wood, and dates … M. loves G. 1972 … There are no dates after the mid-eighties. This must have been one of the schools that was closed down then, for lack of children” (Atwood, 1998:113). Thus, we can narrow down the year to after 1972.

That said, the type of freedom practised during this time is generally individual-based, where each person is allowed to practise their own ‘freedom’ and to act according to their own desires. Again, the protest that Offred’s mother had taken part in serves as an important example. In that demonstration, we see women fighting for the “FREEDOM TO CHOOSE” and to do things as they desire to. Offred’s mother, in particular, is a strong figure that embodies this individualistic freedom. Her decision to conceive Offred at the age of thirty-seven and to bring her up as a single mother may have met with many remonstrations from her friends and other women (Atwood, 1998: 120-1), but the fact that she was able to proceed successfully, as she desired, as long as her decisions and actions did not harm anyone else, is indication enough that the type of freedom practised during this time is one that pertains mostly to an individual’s desire.

In fact, Offred’s mother’s belief in individual freedom is so strong that it even transcends the factor of age. Offred recalls an occasion when her mother had taken her to the park in which a magazine-burning event was being held. When one of the women in attendance had asked Offred’s mother if it was “okay” for Offred “to throw one [magazine] on, honey?” (Atwood, 1998: 38), Offred’s mother had allowed her daughter to choose instead of vehemently objecting to it (as opposed to most protective parents): “If she wants to, my mother said” (ibid.). Thus, in Offred’s mother’s opinion, the ability to choose for herself was important even for a child.

Aside from Offred’s mother, Moira, too, presents an equally imposing figure as an example that demonstrates the spirit of this type of freedom. Moira’s portrayal as a hard-headed, tough-talking, self-sustaining lesbian (later termed ‘Gender Traitor’ during Gileadean times) who works in the publishing division of a women’s collective (Atwood, 1998: 178) during this period reveals her to be a person who values individual freedom. Her choice to reveal her sexual preference as a homosexual makes for a strong stand as it indicates that she is following her desire instead of that of society.

Her generally rebellious nature, too, is another example of individualistic freedom. Moira is depicted as someone who is willing to fight for her own rights and wants instead of obeying the instructions given her by a higher authority, and this characteristic of hers remains throughout the transition from pre-Gileadean times to Gileadean times. When Moira was enlisted as a Handmaid and first brought to the Red Center, she expressed her disgust with the submissive, conforming Handmaid system through her constant need for a cigarette (Atwood, 1998: 73). It was almost impossible to be an individual within a structure where women were forced to wear similar red attire that did not help to distinguish one person from another, and where they were made to adopt
identities according to their current masters instead of retaining their own individuality. Distinctive names and identities were not significant enough features to be preserved, it seems.

Soon after some time at the Center, Moira took matters into her own hands and began to fight for her own individual freedom by escaping. Unlike Offred, who was more cautious and warned her of the consequences, Moira was more daring and willing to risk paying the price for her freedom. In her first escape attempt, she was caught and severely punished for: “Her feet did not look like feet at all. They looked like drowned feet, swollen and boneless, except for the colour. They looked like lungs” (Atwood, 1998: 89, 91). In her second attempt, however, she managed to go as far as Maine, almost to the border (Atwood, 1998: 247), before she was again caught and sent to a detainment camp, and subsequently, to Jezebel’s. The fact that Moira was willing to try and escape despite, having to go through so much pain and endure so many difficulties, indicates just how much she valued her individual freedom. While it is true that she was still caught and sent to Jezebel’s in the end, at least she manages to maintain a measure of individual freedom whereby she can attend to her own desires. As Moira herself puts it, “Don’t worry about me … I’m still here; you can see it’s me … there’s lots of women around. Butch paradise, you might call it” (Atwood, 1998: 249). She may have been forced to accept her situation with “indifference, a lack of volition” (ibid.), but she maintains her individuality, both as a person and as a lesbian.

Even Offred herself, during pre-Gileadean times, is ‘guilty’ of making choices that cater to her own desires, i.e. invoking her personal, individual freedom, without considering the consequences or the subject of morality. Prior to Gileadean times, Offred was involved in an affair with Luke, a married man, before he was properly divorced. In the eyes of society and most religions, such an act would have been morally wrong but Offred seemed to have cared little for their opinions.

From the few examples given above, the emphasis on freedom being an individual choice is obvious, which ultimately helps us understand that freedom, during these pre-Gileadean times, is located as a source instead of an end result.

Also, the practice of freedom during this time is proscribed instead of prescribed, as can be seen when people are more prone to banning things instead of setting down rules to be followed. We see this, again, in the feminist demonstration examples found within the novel. The demonstrations took place not because society had prescribed rules to be obeyed, but because certain things had been banned or disallowed. In the case of the feminist demonstrations and Offred’s mother, the women had been excluded from certain privileges and rights and were, therefore, protesting for them.

**Freedom during Gileadean Times**

As one can expect, then, when the government and people during pre-Gileadean times practised a certain type of freedom, those of Gileadean times would attempt to practise the exact opposite type of liberty in an attempt to reverse the ‘failures’ of the previous age. Aunt Lydia demonstrates this very sentiment when she calls the previous period “the days of anarchy” (Atwood, 1998: 24), indicating a comparison between pre-Gileadean times, which were disordered, chaotic and filled with lawlessness, and the Gilead regime which is ordered, efficient and disciplined – a utopia compared to pre-Gileadean times (which is ironic as the novel is often classified as a dystopian novel).

In order to achieve the aspired orderly society, then, the Gilead government has to resort to a form of iron-fisted rule – an application of a ‘higher-self’ government ruling over ‘lower-self’ individuals in order to help them achieve what is best for them, i.e. their ‘real’ self. They do this through the implementation not only of new bans, but also laws, regulations and new words that create a sort of constraint on both the actions and the mentality of the people. The ‘higher’ selves believe themselves to be knowledgeable enough to make decisions for the rest of the nation, and we
see this exemplified through such instances as when the new, ‘higher’ government begins to prescribe, i.e. pass laws that dictate what are and what are not temptations to the people. For instance, the government, in an act that frames women as individuals who are nothing but an unthinking entity that will respond only to temptations, dictates what kind of attire women should wear (“I sit by the partly open window … in my nightgown, long-sleeved even in summer, to keep us from the temptations of our own flesh, to keep us from hugging ourselves…” (Atwood, 1998:191)), what they can or cannot see (“Everything except the wings around my face…” (Atwood, 1998: 8); “…where the lettering was painted out, when they decided that even the names of shops were too much temptation for us ” (Atwood, 1998:25), even what they can or cannot know (“At the Centre, temptation was anything much more than eating and sleeping. Knowing was a temptation…” (Atwood, 1998:195).

Not only were laws prescribed, certain things were proscribed too. Items considered ‘frivolities’, such as leisure and fashion magazines, make-up and skincare items were banned from certain groups of people, such as the Handmaids. Not only that, the so-called ‘higher-self’ government banned the acts of reading and writing among women. Consequently, this form of rule also translates into a patriarchal, paternalistically-natured, chauvinistic regime where men became the ‘higher’ self and women became the ‘lower’ self to be ‘awakened’, though there were also similar segregations within the gender itself. This domination of ‘higher-self’ women over ‘lower-self’ women is most obvious within the Red Center itself. The rules are numerous, and the Aunts are merciless in their upholding of the laws “for your own good” (Atwood, 1998: 144), but more than that, the girls at the Center are “hers to define, we must suffer her adjectives” (Atwood, 1998: 144).

Nevertheless, men begin to dominate a woman’s life in ways like never before. They ‘package’ the women into categories (such as the Marthas, the Handmaids and the Wives) according to their ‘uses’, claiming that people have to rid themselves of their individual desires for the good of the country, their religion and other citizens. Handmaids, in particular, are susceptible to these kinds of persuasion. They are made into “cradle[s] of life, made of bones; and within, hazards, warped proteins, bad crystals jagged as glass” and “shock troops … [who will] march out in advance, into dangerous territory” – a kind of baby-machine who will produce soldiers to fight for the country. They insist that it is an honour for the Handmaids, and then further strengthen their logic with elements of religion, drawing mostly from the parables of Rachel and Leah to convince the Handmaids that their role is preordained. When the Handmaids pray, they are instructed to pray for “emptiness, so we would be worthy to be filled: with grace, with love, with self-denial, semen and babies … Oh God, obliterate me. Make me fruitful. Mortify my flesh, that I may be multiplied. Let me be fulfilled” (Atwood, 1998: 194). In this way, the Handmaids are coaxed even to allow these ‘higher-self’ males to intrude into their most private life – their sex life.

Thus, from the above examples, we see an abrupt shift in the meaning of freedom. While in pre-Gileadean times, freedom meant having individual choices that might cater to one’s own freedom, i.e. choices are a source of freedom, here freedom becomes an end – one is required to sacrifice one’s desires for the sake of achieving ‘true’ freedom, i.e. making the country a better place for its citizens.

And precisely because freedom has now become a matter of results within this Gilead regime, ideas of morality and consequences, too, become extremely important issues. All women are expected to act morally under this new Gileadean rule, to obey all the laws imposed upon them so as to lead a morally upright life. Everything that they do, they must do because it is morally correct. Aunt Lydia, who speaks of the pre-Gileadean times with (misled) condescension as an immoral period to be ashamed of, is a prime example of a character that is obsessed with morality: “we make her salivate morally” (Atwood, 1998: 114). On occasions, she shows the Handmaids Unwoman documentaries: “old porno films, from the seventies or eighties. Women kneeling, sucking penises or
guns, women tied up or changed” (Atwood, 1998: 118), labelling them “Unwomen [who] were always wasting time” (ibid.) and “Godless” (Atwood, 1998: 119). Here, then, we see how Aunt Lydia has connected the idea of morality with religion which, again, shows the fondness that Gileadean officials have for using religion to boost the significance of certain concepts, morality being one of them.

In terms of consequences, everything that is done under Gileadean rule is calculated to obtain only the results that they desire. Take, for instance, the situation of the Handmaids. Prior to becoming Handmaids, women are required to go through a strict medical check-up (Atwood, 1998: 59) to make certain that they are fertile and ensure their chances of conceiving (i.e. a result) are almost guaranteed. When the results are not as expected, however, such as when they do not conceive or they miscarry, it is usually unfortunate enough to cause a Handmaid to lose her composure and begin to blame herself, such as in the case of Janine: “She [Janine] had an eighth-month miscarriage, didn’t you know … She thinks it’s her fault … Two in a row. For being sinful. She used a doctor, they say…” (Atwood, 1998: 214-5). In all rationality, we can, of course, understand that miscarriage is not a blame that should be assumed wholly by the woman; there may be many other reasons for a miscarriage, but when one is conditioned to think that one’s identity is tied closely with one’s reproductive ability, the situation becomes exactly as Offred puts it: “It’s like Janine … to take it upon herself, to decide the baby’s flaws were due to her alone. But people will do anything rather than admit that their lives have no meaning. No use, that is. No plot” (Atwood, 1998: 215).

Discussion and Conclusion

Following the overview and comparison of the situations in pre-Gileadean and Gileadean times made earlier in this paper, we can, therefore, attempt to slot both periods into their respective ‘types’ of freedom, as per Berlin’s theory. As we can see, then, the type of freedom practised during pre-Gileadean times is one that fits the mould of negative freedom well, whereas that applied during the Gilead regime is one of positive freedom:

Having established that, however, we must now also return to Aunt Lydia’s claim of ‘freedom from’ and ‘freedom to’ to reconfirm the accuracy of her assertion. Is there a discrepancy between Aunt Lydia’s assertion and the way Berlin framed his two freedoms?

To recap, Berlin’s negative and positive freedom are expressed as ‘freedom from’ and ‘freedom to’ in this way: “It is in this sense that positive freedom is the freedom to do certain things while negative freedom is freedom from having to do them” (Putterman, 2006: 420). Aunt Lydia’s use of ‘freedom from’ and ‘freedom to’, on the other hand, is the opposite:
Thus, we notice that there is, indeed, a discrepancy between the way Aunt Lydia uses the terms and how Berlin uses them; Aunt Lydia may have been theoretically wrong in her use. But after all the explication and discussion, a more crucial question remains: is the distinction between ‘freedom from’ and ‘freedom to’, as well as the need to ascertain who is right and who is wrong, so important? Is there a need to draw the line so clearly?

MacCallum (1967: 319) thinks that there is not a need to do so. Instead, he argues that freedom has only ever been one single entity that has a triadic relation. “Freedom”, MacCallum argues, “is always both freedom from something and freedom to do or become something”. In other words, the triadic relation exists between the agent who is searching for freedom from something and the freedom to do something.

Atwood seems to agree, to a certain extent as, throughout the novel, there is no evidence to show that Atwood favoured one over the other. Instead, she realistically depicts how neither type of freedom can exist without the other. In pre-Gileadean days, while one had the freedom to choose, “[w]omen were not protected then. I remember the rules, rules that were never spelled out but that every women knew: Don’t open your door to a stranger…” (Atwood, 1998: 24). People had the freedom to hurt others. In Gileadean times, on the other hand, the circumstances were oppressive, but not entirely so. Take Serena Joy’s coercion of Offred to have sex with Nick, for instance. Serena Joy could have forced Offred into doing it, considering her higher status, but instead, she allows Offred a choice, albeit a limited one. Morality, too, does not seem to be very important to the Commander when he forces Offred into having an affair with him, despite being one of the upholders of a society practising positive freedom.

If anything, what Atwood may be proposing is the fact that extreme execution of either ‘type’ of freedom would be catastrophic. Instead of seeing ‘freedom from’ (negative freedom) and ‘freedom to’ (positive freedom) as two opposite sides of the same coin, instead, Atwood suggests that they may be viewed as being on a continuum, where the middle ground, i.e. a fair mix of negative and positive freedom is at play, is the safest. After all, one cannot exist without the other.

In conclusion, the two different eras in The Handmaid’s Tale can be seen as being framed in terms of the two opposing types of freedom that Isaiah Berlin proposed, i.e. negative and positive freedom. While we may automatically contend that the situation in the Gileadean era is worse than in pre-Gileadean times due to the text’s dystopian setting, and thus it is true, by extension, that the type of freedom practised during pre-Gileadean times is better, it is necessary for the reader to take a step back and question if Atwood is in fact advancing such an argument.
Notes


2 An underground nightclub where prostitutes work.
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The Relationship between the Incidence of Fraud and CAMEL Ratings of Banks in Nigeria

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Abstract

The banking sector mobilizes resources for productive investments and contributes to the economic growth of Nigeria. The sector is operating in a rapidly innovative industry. The significant changes that have occurred in the financial sector have increased the importance of performance analysis of banks. The CAMEL rating system has proved to be an effective internal supervisory tool for evaluating the soundness of a financial firm. The paper, therefore, assessed the relationship between the incidence of fraud and CAMEL ratings of banks in Nigeria. The main argument is that there is no relationship between the rate of fraud and CAMEL ratings of banks in Nigeria. The focus of this paper is the twenty-four (24) deposit money banks in Nigeria within the period 2001-2011. The CAMEL rating was employed for the study. The paper also employed qualitative data collection techniques, correlation and multiple regression analysis. The study revealed that the CAMEL ratings as used by the regulatory bodies did not capture adequately the true situation of banks in Nigeria within the study period. The paper concluded that inadequate appraisal of credit proposals, unfavourable environmental factors and unwillingness of borrowers to repay credit facilities contributed immensely to the deterioration in the quality of banks’ risk assets in Nigeria. The paper recommended that the supervisory and regulatory bodies, the Central Bank of Nigeria (CBN) and Nigeria Deposit Insurance Corporation (NDIC), need to review the CAMEL ratings in terms of the weight assigned to the quality of assets to capture correctly the soundness of banks in Nigeria.

Keywords: Relationship, Incidence, Fraud, CAMEL Ratings, Banks
Introduction

Nigeria is endowed with a large domestic market, abundant natural resources, a considerable amount of entrepreneurial talent and a geographical location capable of exploiting regional and continental markets. The country is one of Africa’s fastest growing economies with banking and financial services companies experiencing significant growth in size and profitability.

The banking sector is an important component of the financial system (Khatun, 2012). The sector mobilizes resources for productive investments and contributes to the economic growth of the country. Banking business depends on trust despite the complexity of transactions and vulnerability of customers due to imperfect information. Banks are expected to observe certain ethical principles of banking profession and organizational ethics, such as honesty, integrity, social responsibility, accountability and fairness, while working under the principles of profitability and productivity. Banking business in Nigeria has, however, encountered a number of fraud and fraudulent incidences that have affected its performance.

Performance is an approach to determining the extent to which set objectives or goals of an organization are achieved in a particular period of time. The objectives or goals can be financial or non-financial. Thus, bank performance is the capacity to generate sustainable profitability. This can be measured looking at the bank’s income and expenses as they affect profitability using financial ratios such as return on assets (ROA), net interest margin (NIM), return on equity (ROE), amount of deposits mobilized, ratio of non-performing credit to total credit available, ratio of non performing credit to shareholders’ funds and bank soundness as measured by CAMEL ratings.

The CAMELS rating system is an international bank-rating system where bank supervisory authorities rate institutions according to six factors namely Capital adequacy, Asset quality, Management quality, Earnings, Liquidity and Sensitivity to Market risk (Investopedia, 2013). This paper considers five of these factors: Capital adequacy, Asset quality, Management quality, Earnings and Liquidity (CAMEL). This is because ‘Sensitivity to market risk’ as a factor is subsumed in Capital adequacy. Dang (2011) sees capital adequacy as the capital expected to maintain balance with the risks exposure of the financial institution such as credit risk, market risk and operational risk. Capital adequacy effectively takes care of sensitivity to market risk.

Dang (2011) avers that CAMEL has proved to be an effective internal supervisory tool for evaluating the soundness of a financial firm, on the basis of identifying those institutions requiring special attention or concern. Bank supervisory authorities, therefore, assign each bank a score on a scale of one (best) to five (worst) for each factor. Thus, if a bank has an average score less than two, it is considered to be a high-quality institution. On the other hand, banks with score greater than three are deemed to be less-than-satisfactory institutions. The CAMEL rating system helps the supervisory authority identify banks that are in need of attention.

The objective of this paper, therefore, is to assess the relationship between the incidence of fraud and bank CAMEL ratings in Nigeria. The main argument is that there is no relationship between the rate of fraud and CAMEL ratings of banks in Nigeria. The focus of this paper is the twenty-four (24) deposit money banks in Nigeria within the period 2001-2011.

Statement of the Problem

Banks facilitate the proper utilization of financial resources and serve as backbone to the financial sector of a country. Khan (2008) and Monnin and Jokipii (2010) found a positive association between financial development and economic growth. Serwa (2010) and Park (2012), on the other hand, discovered that crisis, volatility and corruption in the banking sector have negative implications for the growth of the banking industry.

The banking sector is operating in a rapidly innovative industry. This makes it mandatory for them to create more specialized financial services to meet the varied needs of their customers. In
pursuing this objective, the Nigerian government embarked upon the deregulation of the financial system since 1986 which allowed the influx of banks into the industry. Banks, in the bid to outdo each other, granted credits indiscriminately without proper appraisal (Phillip, 1994). This resulted into bad debts with non-performing loans far exceeding the banks’ loan portfolios. Sanusi (2002) and Owolabi et al (2011) note that the increased number of banks overstretched their existing human resources capacity which culminated in problems such as poor credit appraisal, financial crimes, accumulation of poor asset quality, adverse ownership influences and other forms of insider abuses. These contributed to the distress in the banking industry in Nigeria and the eventual liquidation of some.

Banks are exposed to a variety of risks that are growing more complex every day (Dang, 2011). The economic downturn of 2008 which resulted in bank failures worldwide also had its negative effect on the banking sector in Nigeria. In the light of the banking crisis in recent years worldwide and to cope with the complexity and a mix of risks confronting the banking sector in Nigeria, it is necessary to evaluate the overall performance of banks by implementing a regular banking supervision framework. A measure of supervisory information is the CAMEL rating system. The paper, thus, investigates the use of the CAMEL rating system as a tool to ascertain the safety and soundness of banks and to mitigate the potential risks which may lead to bank failure in Nigeria.

Literature Review

Banks are involved in the financial intermediation activities of a country and also serve as catalysts to the financial sector. Banks operate in a dynamic business environment and are confronted with a lot of challenges including fraud and fraudulent practices. Though banking business should be conducted on trust and confidence derived from competence, the sector is experiencing some measure of malpractices and unethical behaviors. Bank frauds are a worldwide problem. Both developed and developing countries experience the incidence of bank frauds and other forms of financial malpractices with increased magnitude (French, 1986; Rhoads, 1994; Adewunmi, 1998 and Xinhua, 2004).

Coughlan (1983) notes that incidences of fraud and fraudulent practices are not limited to the banks and other organizations in the private sector. They are equally manifest in the public sector and other areas of the economy. The incidence of fraud in the banking industry was, however, exacerbated by the influx of banks into the industry from 1986 as a result of the deregulation of the financial system in Nigeria. Banks gave out loans indiscriminately without proper appraisal. This created many problems such as bad debts, financial crimes and poor asset quality. The deterioration in the quality of banks’ risk assets affected the health of the industry. This was evidenced in the rating of all licensed banks by the Central Bank of Nigeria (CBN) using the CAMEL parameters.

The significant changes that have occurred in the financial sector of Nigeria have increased the importance of performance analysis of banks. As observed by Casu et al. (2006), performance analysis is an important tool used by various agents operating either internally to the bank or who form part of the bank’s external operating environment. Bank rating is a supervisory tool which enables supervisors to evaluate the performance of banks and serves as an early warning signal for detecting emerging problems. To properly rate a bank, both quantitative and qualitative factors are considered. Quantitative assessment is usually based on either the CAMEL or LACE approach, while qualitative assessment is based on such factors as compliance with laws and regulations and control environment. The effectiveness of bank rating is further enhanced, if it allows for comparison, both horizontally and over time. Horizontal comparability in bank rating is achieved by categorizing banks with similar characteristics into peer groups.

There has been some semblance of peer rating of banks in Nigeria, with such descriptions as “the big three”, “first generation banks” and “new generation banks”. Banks can be classified into
Peer group analysis according to the bases or criteria used (e.g. assets and volume of deposits), on the basis of ownership (e.g. state-owned or privately owned banks), by the segment of the banking industry to which the bank belongs (e.g. merchant or commercial), by business line; by geographical spread and the health status of the bank. Peer group analysis is undertaken to ascertain whether an individual bank is performing in a significantly different way from its peers and the reason for such a difference, which may attract supervisory concern. The analysis is also used to examine trends in the banking sector as a whole, or in a particular segment of the banking sector, and to carry out a systematic analysis across the selected field. In a limited form, it is used for performance stress testing and scenario analysis. Table 1 shows the bank classification based on CAMEL ratings.

Table 1: Bank Classification based on CAMEL Ratings

<table>
<thead>
<tr>
<th>Class</th>
<th>Composite Score</th>
<th>Rating</th>
<th>Condensed Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>86-100</td>
<td>Very Sound</td>
<td>Sound</td>
</tr>
<tr>
<td>B</td>
<td>71-85</td>
<td>Sound</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>56-70</td>
<td>Satisfactory</td>
<td>Unsound</td>
</tr>
<tr>
<td>D</td>
<td>41-55</td>
<td>Marginal</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>0-40</td>
<td>Unsound</td>
<td></td>
</tr>
</tbody>
</table>


Peer group analysis alone is not sufficient to identify the complex risk structure of a banking institution as changes in the performance, either of peer groups or of the banking system as a whole, are not accounted for in the results. The analysis also depends on the data reported in the statutory returns and annual accounts. The integrity, timeliness and quality of the processing of data as well as sound accounting practices are a pre-condition for the analysis to be effective. Peer rating of Nigerian banks is based on assets size. The banks are grouped as follows: N5 billion and below, above N5 billion to N10 billion, above N10 billion to N20 billion, above N20 billion to N100 billion, and over N100 billion. Group averages are calculated and applied in the final rating. The assessment of group performance is also facilitated by comparing the group averages with the industry average. The choice of assets size is informed by the fact that it allows for better comparison of performance indicators than any of the other criteria.

The CAMEL ratings as assigned by the Central Bank of Nigeria (CBN) and Nigeria Deposit Insurance Corporation (NDIC) uses a weighted rating based on Capital, Asset quality, Management quality, Earnings and Liquidity to assign ranks to banks as either very Sound, Sound, Satisfactory, Marginal or Unsound. But for purpose of analysis, the paper condensed the ratings into two - Sound and Unsound banks. Sound banks comprised banks that had been given ratings of very sound, Sound or Satisfactory. The condensed unsound category then comprised banks that had been rated Marginal or Unsound by the supervisory agencies. The percentage component and factor weights of CAMEL factors in Nigeria are as contained in Table 2.
### Table 2: Weight of CAMEL Factors in use in Nigeria

<table>
<thead>
<tr>
<th>Factor</th>
<th>Component</th>
<th>Component Weight (%)</th>
<th>Factor Weight (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital</td>
<td>i. Capital to risk asset ratio</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>ii. Adjusted capital ratio</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iii. Capital growth rate</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Asset quality</td>
<td>i. Non-performing risk assets to total risk assets</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>ii. Reserve for losses to non-performing risk assets</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iii. Non-performing risk assets to capital &amp; reserves</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Management quality</td>
<td>i. CAEL/85*</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>ii. Compliance with laws/regulations</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Earnings</td>
<td>i. Profit sector tax to total assets</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ii. Total expenses to total income</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iii. Net interest income to total earning assets</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iv. Interest expenses to total earning assets</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Liquidity</td>
<td>i. Liquidity ratio</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>ii. Net loans &amp; advances to total deposits</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iii. Volatility dependence ratio</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

CAEL/85 = Composite scores for Capital, Assets, Earnings & Liquidity divided by 85

*Net of interest in suspense

**Source:** CBN Annual Reports 2001-2011

Bank regulators use financial ratios to help evaluate a bank’s performance as part of the CAMEL rating system (Yue, 1992). Maishanu (2004) and Mous (2005) used ratios to appraise bank performance. Maishanu (2004) employed a univariate model for predicting failure in commercial banks. In comparing two bankruptcies predicting models using financial ratios, Mous (2005) found that the decision tree approach classified 89% of bankrupt banks within two years. The financial ratios used had variables of profitability, liquidity, leverage, turnover and total assets. However, the changing nature of the banking industry calls for more flexible alternative forms of financial analysis. The parametric methods (Asaftei & Kumbhakar, 1995), the stochastic frontier approach (SFA), the thick frontier approach (TFA) and the distribution freehall approach (DFA); and the non parametric method of data envelopment analysis (DEA) [Wirnkar & Tanko, 2007] are types of the alternative forms of financial analysis which are flexible to employ.

In evaluating the performance of 60 Missouri Commercial Banks between (1984-1990) using DEA with an intermediary approach of inputs (interest expenses, non-interest expenses, transaction deposits, and non-transaction deposits) with outputs (interest income, non-interest income and total loans), Yue (1992) found that while five of the Missouri banks were technology efficient, they were not operating at the most efficient scale of operation.
Performance measures are quantitative or qualitative ways to characterize and define performance. They provide a tool for organizations to manage progress towards achieving predetermined goals. Venkatraman & Ramanujam (1987) state that it is generally preferable to use multiple methods of measuring a phenomenon of interest to minimize the effects of method bias. Performance links an organization’s goal and objectives with organization decisions. According to Uboh (2005), performance can be based on results, output or outcomes such as competitiveness, profit and determinants of results such as prices or products.

Kaplan (1984) asserts that effective organizational performance should be measured using a “balanced scorecard” to bridge the gap between theory and practice. Studies have shown that performance measurement interlinks financial indicators such as the use of financial ratios, as suggested by Sagar and Rajesh (2008). These measurements aid in interpreting bank performance while serving as crucial policy-making tools in reacting to the dynamics of the market for financial services. This also necessitates several classifications of banks into failed/surviving financially; successful/non-financially successful; and vulnerable/resistant as well as troubled/healthy banks (Sinkey, 1992; Siems, 1992). Other drivers of success in banks are non-financial measures such as process efficiency, human resource development, leadership effectiveness, customer retention and growth, product and service innovation, brand image and reputation, customer and employee satisfaction, innovation and quality. The balanced scorecard measures include market share, changes in intangible assets such as patents or human resources skills and abilities, customer satisfaction, product innovation, productivity, quality, and stakeholder performance.

In 1990, the CBN issued the circular on capital adequacy which relate bank’s capital requirements to risk-weighted assets. It directed banks to maintain a minimum of 7.25 percent of risk-weighted assets as capital; to hold at least 50 percent of total components of capital and reserves; and to maintain the ratio of capital to total risk-weighted assets as a minimum of 8 percent from January, 1992. Despite these measures and reforms embodied in such legal documents as Chartered Institute Bankers of Nigeria (CIBN) Act No. 24 of 1991 and Banks and Other Financial Institutions (BOFI) Act No. 25 of 1991 as amended, the number of technically insolvent banks increased significantly during the 1990s. It is estimated that, on the average, banks in Nigeria were at risk of losing one million naira every working day due to the incidence of fraud which comes in different forms. In response to this, commercial banks have almost universally embarked upon an upgrading of their risk management and control systems. Also, it is in the realization of the consequence of deteriorating loan quality or profitability of the banking sector and the economy that this research work was motivated.

The negative impact of moral hazards and price shocks on the financial system can be reduced by good regulation and supervision. Consequently, this will minimize bank failure and financial system distress. NDIC, in 1995, highlighted inadequate manpower as one of the challenges confronting its supervisory function. In 1999, the CBN reiterated this problem when it noted that the ability of CBN to perform its regulatory role in the past had been affected by inadequate manpower both in terms of quality and quantity. The collapse of the Bank for Credit and Commerce International (BCCI) Ltd. of London in 1991 was the most famous and biggest bank fraud in history and revealed the supervisory body’s failure in its duty.

Okeke (2004) contends that ethics and good conduct were sacrificed for deposits and professionalism thrown overboard. A peculiar unethical practice in the Nigerian banking industry to mobilize funds was the debasement of womanhood. This practice manifested itself in the use of young female bankers as baits for deposit mobilization. The young girls were employed and given fantastic remunerations but unrealistic targets for deposit mobilization. Thus, in an effort to realize these targets, they (girls) engaged in unethical practices that debased womanhood and tarnished the banking profession. The banking sector has been criticized for celebrating prostitution in the guise of
marketing banking services and products (Unegbu, 2004). The implication is that in an effort to attract deposits by all means, these bankers may even contravene the provisions of the Money Laundering Act by collecting deposits from questionable persons. This implies that when performance goals set by management are overly outrageous and unrealistic, fraud and unethical practices will occur.

Methodology

The CAMEL rating was employed for the study. This used a weighted rating based on Capital adequacy, Asset quality, Management quality, Earnings and Liquidity to assign ranks to banks as very sound, sound, satisfactory, marginal or unsound. The study also employed qualitative data collection techniques, correlation and multiple regression analysis to determine the relationship between the incidence of fraud and CAMEL ratings of banks in Nigeria within the period 2001-2011.

Results and Discussion

The CAMEL ratings assigned by the CBN and NDIC, as discussed in the literature, was employed to determine the relationship between fraud and bank ratings in Nigeria within the period of study. Fig. 1 established the relationship between ROA, ROE and amount of money lost to fraud by banks.

Fig. 1: Relationship between ROA, ROE and amount of money lost to fraud for the period 2001-2011.

![Graph](image)

**Source:** CBN Annual Reports 2001-2011

The figure revealed that ROA and ROE were highly correlated (r =0.709) but amount lost to fraud was only negatively correlated to ROE (r= -0.273). The amount of money lost to fraud was also negatively correlated with bank efficiency. The correlation was, however, very low with the value r=-0.050.

Fig. 2: Ratios of Non-performing credit to total credit and Shareholders’ funds 2001 - 2009
Data for the period 2010-2011 were not available during the period of study. As shown in Fig. 2, the quality of risk assets worsened progressively from 2001 to 2004. The data revealed that the ratio of non-performing credit to total credit was greater than 100% in 2004. This implied that the shareholders’ funds had been completely eroded by the non-performing credit portfolio throughout the industry. The improvement in the ratio of non-performing loans to total loans in subsequent years was linked to the purchase of toxic loans by Asset Management Company of Nigeria (AMCON).

The percentage of banks rated sound or unsound by the CAMEL ratings is shown in Figures 3 and 4.

**Fig. 3:** Percentages of sound and unsound banks using modified CAMEL rating

**Source:** CBN Annual Reports 2001-2011

Fig. 3 shows percentages of sound and unsound banks using a condensed CAMEL rating. Between 2001 and 2004, more than 70% of banks were rated sound by supervisory agencies in spite of the fact that most banks were pronounced distressed and some had to merge or re-capitalise. The banking industry level of soundness declined in 2009. This confirms Winkar and Tanko (2007)’s finding that the CAMEL rating did not adequately capture the holistic performance of banks. They advocated the changing of CAMEL to CLEAM rating to reflect the weight or importance in each of
the factors. They also showed that the best adequacy ratios to be used by bank regulators should be the ratio of total shareholders’ fund to total risk weighted assets.

**Fig. 4:** Condensed CAMEL ratings shown against fraud cases

![Graph showing the relationship between fraud cases and CAMEL ratings.](image)

**Source:** CBN Annual Reports 2001-2011

Fraud and forgery cases were highest in 2010, though 2009 recorded the highest percentage of unsound banks. There seems to be a lag between the effects of fraud cases on bank soundness. This is further strengthened by the correlation result of the condensed CAMEL rating with the number of fraud cases which revealed a negative association between them (r = -0.424). This implies that there is relationship between CAMEL ratings and percentage of unsound banks.

The paper also employed multiple regression analysis to determine the relationship between incidence of fraud and CAMEL ratings of banks in Nigeria within the period of study.

**Table 3:** Ratio of Non-Performing Credit

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
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<tbody>
<tr>
<td>1</td>
<td>(Constant)</td>
<td></td>
<td>2.401</td>
<td>.047</td>
</tr>
<tr>
<td></td>
<td>Ratio of non performance to shareholders</td>
<td>10.721</td>
<td>4.466</td>
<td>.526</td>
</tr>
</tbody>
</table>

**Source:** Field Survey 2013

Table 3 shows the relationship between incidence of fraud and CAMEL ratings of banks. The value of fraud and CAMEL ratings of banks is 0.146; which is greater than the alpha value of 0.05. This implies that there is no significant relationship between incidence of fraud and CAMEL ratings of banks.

**Conclusion and Recommendations**

The paper found that inadequate appraisal of credit proposals, unfavourable environmental factors, sheer unwillingness of borrowers to repay credit facilities and the corresponding ineffectiveness of the rule of law to catch up with pathological loan defaulters contributed immensely to the deterioration in the quality of banks’ risk assets in Nigeria. Robert and Gary (1994) state that
the most obvious characteristic of failed banks is not poor operating efficiency, but an increased volume of non-performing loans. Non-performing loans in failed banks have typically been associated with regional macroeconomic problems. Brownbridge (1998) claimed that the single biggest contributor to the bad loans of many of the failed banks was insider lending. He further observed that the second major factor contributing to bank failure was the high interest rates charged to borrowers. The calibre of management also accounted for the difference between failed banks and those that remained healthy or recovered from problems. The most profound impact of high non-performing loans in a bank’s portfolio is reduction in the bank profitability especially when it comes to disposals.

The study also revealed that the CAMEL ratings as used by the regulatory bodies did not capture adequately the true situation of banks in Nigeria within the study period. Evidence from the study showed that although existing banks had CAMEL ratings showing that over 70% of them were sound in 2002, by December of the same year, 35 banks were distressed and their licences revoked. In January 2006, licences of 14 more banks were revoked following their failure to meet the minimum re-capitalization directive of the CBN. Ironically, some of these banks had ratios of performing credits that were less than 10% of loan portfolios.

The paper recommends that the supervisory and regulatory bodies, CBN and NDIC, need to review the CAMEL ratings in terms of the weight assigned to the quality of assets to capture correctly the soundness of banks in Nigeria. Also, given the substantial growth in the quantum of frauds and forgeries within the period of study, it is important that banks strengthen their internal control and security systems to reduce the incidence of frauds and forgeries.
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Appendix 1

Relationship between Return on Assets and Return on Equity

<table>
<thead>
<tr>
<th>Year</th>
<th>Return On Assets</th>
<th>Return On Equity</th>
</tr>
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<tr>
<td>2001</td>
<td>4.73</td>
<td>55.81</td>
</tr>
<tr>
<td>2002</td>
<td>3.47</td>
<td>36.60</td>
</tr>
<tr>
<td>2003</td>
<td>2.67</td>
<td>25.52</td>
</tr>
<tr>
<td>2004</td>
<td>3.12</td>
<td>27.35</td>
</tr>
<tr>
<td>2005</td>
<td>1.85</td>
<td>12.97</td>
</tr>
<tr>
<td>2006</td>
<td>1.61</td>
<td>10.60</td>
</tr>
<tr>
<td>2007</td>
<td>3.89</td>
<td>23.44</td>
</tr>
<tr>
<td>2008</td>
<td>3.95</td>
<td>22.01</td>
</tr>
<tr>
<td>2009</td>
<td>-9.28</td>
<td>-64.72</td>
</tr>
<tr>
<td>2010</td>
<td>3.91</td>
<td>162.98</td>
</tr>
<tr>
<td>2011</td>
<td>0</td>
<td>0.50</td>
</tr>
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</table>

Source: CBN Annual Reports 2001-2011

Appendix 2

Ratio of non-performing credit to shareholders funds

<table>
<thead>
<tr>
<th>Year</th>
<th>Non-performing Credit</th>
<th>Ratio of non-performing Credit to shareholders funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>16.90</td>
<td>77.1</td>
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<tr>
<td>2002</td>
<td>21.30</td>
<td>85.9</td>
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<tr>
<td>2003</td>
<td>21.60</td>
<td>88.9</td>
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<tr>
<td>2004</td>
<td>23.10</td>
<td>105.3</td>
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<tr>
<td>2005</td>
<td>20.13</td>
<td>59.0</td>
</tr>
<tr>
<td>2006</td>
<td>7.92</td>
<td>22.1</td>
</tr>
<tr>
<td>2007</td>
<td>7.39</td>
<td>22.6</td>
</tr>
<tr>
<td>2008</td>
<td>6.30</td>
<td>16.6</td>
</tr>
<tr>
<td>2009</td>
<td>27.60</td>
<td>13.6</td>
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Source: CBN Annual Reports 2001-2009

Appendix 3

Correlation Matrix for Independent Variables

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<th>1</th>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retun on Assets (1)</td>
<td>0.709</td>
<td>0.017</td>
<td>0.321</td>
<td>0.382</td>
<td>0.401</td>
<td>0.152</td>
<td>-0.188</td>
<td>-0.248</td>
<td>-0.370</td>
</tr>
<tr>
<td></td>
<td>(0.22)</td>
<td>(0.966)</td>
<td>(0.365)</td>
<td>(0.276)</td>
<td>(0.276)</td>
<td>(0.676)</td>
<td>(0.603)</td>
<td>(0.489)</td>
<td>(0.293)</td>
</tr>
<tr>
<td>Return on Equity (2)</td>
<td>0.333</td>
<td>-0.103</td>
<td>0.091</td>
<td>0.103</td>
<td>-0.273</td>
<td>0.467</td>
<td>-0.370</td>
<td>-0.103</td>
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<tr>
<td></td>
<td>(0.381)</td>
<td>(0.777)</td>
<td>(0.803)</td>
<td>(0.776)</td>
<td>(0.446)</td>
<td>(0.174)</td>
<td>(0.293)</td>
<td>(0.777)</td>
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<td>Efficiency</td>
<td>-0.583</td>
<td>-0.300</td>
<td>-0.343</td>
<td>-0.050</td>
<td>0.500</td>
<td>-0.117</td>
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<tr>
<td>Ratio (3)</td>
<td>(0.099)</td>
<td>(0.433)</td>
<td>(0.366)</td>
<td>(0.898)</td>
<td>(0.170)</td>
<td>(0.765)</td>
<td>(0.125)</td>
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<tr>
<td>Fraud&amp; Forgeries (4)</td>
<td>0.764</td>
<td>0.907</td>
<td>0.218</td>
<td>-0.700</td>
<td>0.673</td>
<td>0.936</td>
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</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td>(0.000)</td>
<td>(0.519)</td>
<td>(0.016)</td>
<td>(0.023)</td>
<td>(0.000)</td>
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<td>Description</td>
<td>Correlation</td>
<td>Significance Level</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Amount Involved</td>
<td>0.902</td>
<td>(0.000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Amount Lost by banks</td>
<td>0.387</td>
<td>(0.239)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>No of Fraud cases that led to losses</td>
<td>-0.545</td>
<td>(0.083)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of mobilised funds lost</td>
<td>-0.327</td>
<td>(0.326)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Total No of Staff Involved</td>
<td>-0.609</td>
<td>(0.047)</td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>

The first number listed is the correlation; the number in parentheses is the significance level.

*** Significant at the .001 level or less (two-tailed). ** Significant at the .01 level. * Significant at the .10 level.
Growth Alterations by Water Soluble Fraction of Crude Oil in Fry of Cat fish (Clarias gariepinus)

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Chemistry Department, Adekunle Ajasin University Nigeria

E.M, Obuotor,
Obafemi Awolowo University, Ile Ife, Nigeria.

V.F, Olaleye.
Obafemi Awolowo University, Ile Ife, Nigeria.

Abstract
This study investigated the growth of the Clarias gariepinus fry under varying concentrations of water soluble fraction of crude oil. Escravos crude oil samples were collected from warri refinery and Petrochemical Company, Delta State, Nigeria and prepared in the laboratory into water soluble fraction using standard methods. Brood stock of two adult female and one adult male for the study were purchased from a local farm in Ota, Ogun State, Nigeria, kept in conditioned aquarium in the laboratory and induced to lay eggs after days. In the chronic toxicity assay, a set of 60 14-day old fry were exposed to varying water soluble fraction concentrations of crude oil 0.00%, 0.09%, 0.18% 0.37% 0.74% 1.49% for 30days. The experiment was replicated four times. The test solution was replaced daily and fish fed ad libitum with artemia. Swimming behavior and changes in body weight of fry were monitored. The data obtained were subjected to Dunnett statistical test and linear interpolation to obtain values for No-observed-effect-concentration (NOEC), Lowest-observed-effect-concentration (LOEC), Inhibition concentration at 25% (IC_{25}) and 50% (IC_{50}) and application factor (AF). The no-observed-effect-concentration (NOEC) and the lowest-observed-effect-concentration (LOEC) recorded were 0.09% and 0.18% respectively. The application factor was 0.13. The inhibition concentration IC25 and IC50 of the crude oil on the fry were 0.12-0.18% and 0.18-0.37% respectively. Significant lower growth rate value (P<0.05) occurred in fry of 0.18% concentration. The study concluded that water soluble fraction of crude oil at increasing concentrations adversely affected the growth of Clarias gariepinus fry.
Introduction

Nigeria is the largest oil producer in Africa and the eleventh largest in the world. The mainstay of Nigeria’s economy is the Petroleum sector, contributing about 90% of the nation’s foreign exchange earnings and about 25% of the Gross Domestic Products but there are environments problems when the crude oil spills. Oil spillage did not receive much attention until the late 1970’s when documentation commenced. According to the National Oil spill detection and Response Act 2006, available statistics in it showed that a total of 9,107 oil spill incidences occurred between 1976 and 2005 resulting in about 3,121,909.8 barrels of oil spill into the environment (Ojediran and Ndibe, 2005). In the Niger Delta area alone, there have been over 550 reported cases of crude oil spillage since 1976, releasing 2.8million barrels of crude oil into the environment (Odiete, 1999). The presence of crude oil into the environment through spillage most of the time is accidental, while its deliberate introduction into the environment is often termed sabotage (Nwankwo and Ifeadi, 1998). It is now a recognized fact that environmental pollution problems associated with oil and gas exploration exist in the Niger Delta area (Kori-Siakpere, 1998)

Oil pollution, which is one of the environmental consequences of crude oil exploration and exploitation activities produce aqua-toxicological effects which are deleterious to aquatic life (Kori-Siakpere, 2000; Agbogidi et al; 2005). A variety of pollutants including crude oil and its pollutants are known to induce stress conditions which impair the health of fish (FEPA, 1991). Ekweozor (1989) reported that frequent spillage of crude oil and its products in creeks and rivers of the Niger Delta have resulted in marked reduction in the number of both fresh water and marine organisms. Crude oil can have population effects through destruction of sensitive juvenile stages or through reduction of the prey species (Horsefall and Spiff, 1998) and contamination of water bodies by hydrocarbons have been shown to produce sub-lethal changes in fish that are both chronically and briefly exposed (Sabo and Stegeman, 1977).

Clarias gariepinus is of high importance in Nigeria fresh water and is widely cultured due to its market price, fast growth rate and ability to withstand adverse environmental conditions especially low dissolved oxygen content (Esenowo and Ugwumba, 2010). This study is aimed at investigating the growth alterations of the water soluble fraction of crude oil on the fry of C. gariepinus.

Materials and Method

i. The WSF’s were prepared following the procedure described by Afolabi et al (1985) two hundred (200ml) of crude oil was added into 800ml of dechlorinated tap water into a 1000ml capacity borosilicate screw capped conical flask. Each crude oil/water mixture was shaken for 24hrs using a Gallenkamp orbiter stirrer. The mixture was then allowed to stand for a minimum of 3hours to obtain a clear interphase between oil and water. The mixture was later poured into a glass stopper separating funnel and allowed to settle overnight after which most of the oil droplets in the WSF would have settled in the upper layer and only a pure and clear WSF’s was obtained at the lower part of the separating funnel. The WSF was then siphoned into dark coloured screw-capped Winchester bottle.

ii. Fish collection and hatchling– 1kg female and 1.2kg male Clarias gariepinus bloodstocks were purchased from a fish farm in Ota, Ogun State and brought to the laboratory for artificial induction. The female brood stock injected with 1ml ovaprim and left for a latency period of 8hrs at 250C. The ripe eggs were then stripped into a clean plastic bowl and the batch of milt collected from the male C. gariepinus brood stock was spread on the eggs and mixed together with feather for fertilization to take place. To facilitate the mixing, 1ml of 5% saline solution was added. The fertilized eggs were then spread on
netting material in the prepared glass tank with constant aeration for 24 hours. The hatchlings that emerged were then used for the chronic toxicity testing.

iii. Chronic bioassay-1000 fertilized hatchling subsequently obtained were allowed to acclimatize in the laboratory for 14 days and fed ad libitum with Artemia cysts prior to the chronic toxicity. Five graded concentrations (0.09, 0.18%, 0.37%, 0.74% and 1.49%) of WSF of the crude oil were prepared in transparent plastic bowls with a dilution factor of 0.5 and a control without the crude oil. Each concentration and control was in four replicates. Twenty (20) C. gariepinus were randomly selected and introduced into each of the exposure chambers. The test solution was replaced daily and fish fed ad libitum for 30 days. Feeding was terminated before the final expiration of the experiment. The number of living fry in the test solution was recorded daily and dead larvae removed. The test was stopped at the end of the 30 days exposure. Surviving fry in each test chamber were counted and immediately prepared as a group for drying and weighing to determine changes in body weight. The result was subjected to dunnett statistical test to obtain the values for NOEC and LOEC. The data was also subjected to linear interpolation for IC25 and IC50.

iv. Determination of water physico-chemical conditions - water quality test in the static renewal bioassay was determined for selected parameters such as pH, dissolved oxygen, conductivity and temperature at the end of every 24 hour exposure for each test concentration and control. pH was determined using a La Motte Analogy pH meter, conductivity was determined using a Jenway conductivity meter E512, mercury in glass thermometer and titrimetric method were used for temperature and dissolved oxygen respectively.

Results

The result of the chronic toxicity test is shown in table 1. During the first week of exposure, the results showed that high mortalities occurred when C. gariepinus fry were exposed to WSF of crude oil with concentrations between 0.37% and 1.49%. Mortalities ranging between 11.25% (0.18% inclusion) and 23.75% (1.49% WSF inclusion) occurred in the fry during the 2nd week of exposure. During the third week of exposure, introduction of WSF of crude oil resulted in mortalities ranging between 7.5% (0.09% inclusion) and 28.75% (1.49% WSF inclusion). The highest mortality (35.00) % was recorded in C. gariepinus fry exposed to 1.49% WSF of crude oil after 4 weeks exposure. At the end of the 4 weeks exposure, 7.5% mortality was recorded in the control tank without WSF of crude oil inclusion.
Table 1: Chronic Toxicity of WSF to *C. gariepinus* frys after 30 days exposure

<table>
<thead>
<tr>
<th>Days of exposure</th>
<th>Concentration %</th>
<th>% Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>0.00</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>0.09</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>0.18</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>0.37</td>
<td>11.25</td>
</tr>
<tr>
<td></td>
<td>0.74</td>
<td>12.50</td>
</tr>
<tr>
<td></td>
<td>1.49</td>
<td>15.00</td>
</tr>
<tr>
<td></td>
<td>0.00</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>0.09</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>0.18</td>
<td>11.25</td>
</tr>
<tr>
<td></td>
<td>0.37</td>
<td>13.75</td>
</tr>
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<td>0.74</td>
<td>18.75</td>
</tr>
<tr>
<td></td>
<td>1.49</td>
<td>23.75</td>
</tr>
<tr>
<td></td>
<td>0.00</td>
<td>5</td>
</tr>
<tr>
<td>21</td>
<td>0.09</td>
<td>7.5</td>
</tr>
<tr>
<td></td>
<td>0.18</td>
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<tr>
<td>30</td>
<td>0.09</td>
<td>12.50</td>
</tr>
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</tr>
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<td></td>
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<td>18.75</td>
</tr>
<tr>
<td></td>
<td>0.74</td>
<td>30.00</td>
</tr>
<tr>
<td></td>
<td>1.49</td>
<td>35.00</td>
</tr>
</tbody>
</table>

Table 2: Average weight gain (g) in the African catfish *C. gariepinus* frys exposed to different concentrations of WSF of crude oil

<table>
<thead>
<tr>
<th>Days of exposure</th>
<th>Control</th>
<th>0.09%</th>
<th>0.18%</th>
<th>0.37%</th>
<th>0.74%</th>
<th>1.49%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.11</td>
<td>0.10</td>
<td>0.10</td>
<td>0.11</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td>7</td>
<td>0.25</td>
<td>0.24</td>
<td>0.24</td>
<td>0.21</td>
<td>0.12</td>
<td>0.11</td>
</tr>
<tr>
<td>14</td>
<td>0.42</td>
<td>0.31</td>
<td>0.29</td>
<td>0.28</td>
<td>-0.02</td>
<td>-0.05</td>
</tr>
<tr>
<td>21</td>
<td>0.51</td>
<td>0.48</td>
<td>0.40</td>
<td>0.17</td>
<td>-0.06</td>
<td>-0.03</td>
</tr>
<tr>
<td>30</td>
<td>0.59</td>
<td>0.52</td>
<td>0.48</td>
<td>0.03</td>
<td>-0.03</td>
<td>-0.33</td>
</tr>
<tr>
<td>Mean +SE</td>
<td>0.44±0.03</td>
<td>0.38±0.03</td>
<td>0.35±0.02</td>
<td>0.17±0.02</td>
<td>0.025±0.11</td>
<td>0.000±0.00</td>
</tr>
</tbody>
</table>

Table 3: Mean % survival and weight gain by *C. gariepinus* fry (n=80)

<table>
<thead>
<tr>
<th>WSF CONC.</th>
<th>% Survival</th>
<th>Mean weight gain (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>96.80</td>
<td>0.44±0.33</td>
</tr>
<tr>
<td>0.09</td>
<td>94.30</td>
<td>0.38±0.03</td>
</tr>
<tr>
<td>0.18</td>
<td>85.60</td>
<td>0.35±0.02</td>
</tr>
<tr>
<td>0.37</td>
<td>85.60</td>
<td>0.17±0.02</td>
</tr>
<tr>
<td>0.74</td>
<td>78.10</td>
<td>0.025±0.01</td>
</tr>
<tr>
<td>1.49</td>
<td>74.35</td>
<td>0.000±0.00</td>
</tr>
</tbody>
</table>

The Anova’s table for the dunnet’s test and the result of the student’s test for each WSF of crude oil showed that *C. gariepinus* fry exposed to 0.18% WSF of crude oil have a significant lower growth rate P(0.05) than the control. The results also showed that 0.18% WSF of crude oil inclusion gave the Lowest-Observed-effect-control (LOEC) while 0.09% WSF of crude oil concentration in
the static bioassay gave the No-observed-effect-conc. The highest dilution of the WSF of crude oil that the *C. gariepinus* fry were exposed to and caused no observable effect was 0.09% while the lowest concentration that fry were exposed to and caused no adverse effect was 0.18% at the same time, 0.18% WSF represents the concentration at which growth rate of the fry was inhibited by 50% while 25% inhibition growth rate occurred at 0.12% WSF of crude oil.

**Chronic value**

Analysis of the geometric means between the NOEC and LOEC values gave the chronic value (CHV) of 0.30 for the WSF exposed to *C. gariepinus* fry

\[ \ln(CHV) = \frac{\ln(NOEC + LOEC)}{2} \]

\[ = -2.407 + (-1.7148) \]

\[ \ln(CHV) = -2.026 \]

\[ CHV = 0.12 \]

**Discussion**

Earlier studies by Dede and Kaglo (2001) observed that the dissolved oxygen tension in water contaminated with water soluble fraction of diesel fuel impacted oxygen stress in *Oreochromis niloticus* fingerlings. Decrease in weight in the fish fry with increase in WSF of crude oil observed in this study agreed with the observation of Omorogie et al (1990) who reported that sub-lethal concentration of toxicants in aquatic environments often result in several physiological dysfunctions instead of outright mortality of fish. The weight gained by the fry in the control tank were significantly different (P<0.05) from those of fry exposed to 0.09% WSF of crude oil, however fish fry exposed to 0.18% concentration WSF of crude oil had significant weight reduction than the fry in the control tank. This was similar to Esenowo and Ugwumba (2010) who reported that growth performance of *C. gariepinus* fingerlings exposed to sub-lethal concentration of detergent and diesel oil had significant weight difference from the control (P<0.05). The weight reduction in fry exposed to very high concentrations of WSF could not be attributed to temperature because during the study, the temperature fell between 24-27°C which were within the limit for optimal growth in tropical fishes. The overall toxicity recorded for the fry of the African catfish *Clarias gariepinus* was not influenced by temperature which was within the normal range (25°C). It was established from this study that the maximum concentration at which the crude oil could be present and not toxic to the fish fry was 0.09-0.18%. The 0.12% WSF concentration of crude oil inhibited growth of *C. gariepinus* by 25% and the effect of the WSF began to manifest in the exposed fish. (USEPA, 2002)

The lowest concentration of WSF crude oil concentration that caused an adverse effect (WSF 0.18%) was also the concentration at which growth of the fry was inhibited by 50% (USEPA, 2002)

**Conclusion**

The water soluble fraction of crude oil at increasing concentrations negatively affected the growth of fry of *C. gariepinus*. The chronic toxicity of WSF to the fry has serious implication for recruitment of the young into fish populations.

**Recommendation**

Government as well as oil company in the area where oil are been exploited and process should ensure that petroleum is not spill and if spilled it should be immediately clean from the environment.
References


Between Primitive Hut and Large Scale Housing, the Presence of Utopia in Architecture

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Abstract
Not until the emergence of early Humanism do concepts of ideal cities enter urban development history.

Leon Battista Alberti composes the first architectural theory of post-antiquity (Leon Battista Alberti, „De Re Aedificatoria“). The city Pienza is the first to be built by ideal standards and Thomas Morus publishes the first literary utopia (Thomas Morus, „Utopia“). From now on, these strands remain in parallel. Another corresponding element between the form of thought and the utopian genre and their influence on modern practices of act and thought lies in their demand for change. The ability to change things is no longer revoked from human activity, but assigned to human agency. A similar idea can be found in those works of architectural theory and drafts of ideal cities that assign architects to the task of solving problems of close living conditions in a rational manner.

However, there is no initially defined architectural structure for literary utopias. While utopias are acting as alternative concepts to their society of origin, the particular architectural models are also standing for disruptions in their respective epoch. Therefore architecture as well as utopias allows conclusions to be drawn concerning specific social and economic situations of upheaval. The talk will address both variants of utopian concept, the archistic and anarchistic architecture tradition, and the corresponding architectural ideas. By drawing upon known and unknown written texts, drawings, planned and built cities, the talk traces these ideas from the ideal cities of the Early Modern Period to current day architectural designs and built architecture in the Asian Region. The ideal types, architecture build and un-built, can be summed up into two categories. Compacted large structures like palace buildings, community houses and large-scale housing on the one hand and small structures like the primitive hut, houses in the green belt of a garden city and sustainable building of the late 20th and early 21st century on the other hand.

Keywords
Utopian architectural models, community housing, large-scale housing, garden city, urban planning, contemporary architecture, sustainable architecture
On January 4th, 2012, under the provocative headline “Der Fluch des Eigenheims (The Curse of the Private Residential Building)” the FAZ (Frankfurter Allgemeine Zeitung) presented Moriyama House, built by the architect Ryue Nishisawa in a suburb of Tokyo in 2005, as the future of housing. The house is meant to be a counter-design to the “closed off” single-family house of the nuclear family, the 20th century’s highly valued house in the green belt. Moriyama House is a miniature town consisting of ten one- to three-storey cubes on a plot of 300 square metres. The miniature houses or room boxes are connected by a labyrinth-like, roofless system of paths and gardens. The roofs of the miniature houses serve as roof terraces. The network-like system of paths provides semi-public or semi-private places for all inhabitants. Each residential box is equipped with a bathroom and a stove, furthermore there is a communal room. One or several of these miniature houses may be used as residential places both by “singles, families, pensioners and those on their way through”, and by “extended circles of friends” or “cross-family residential clusters”.1

On February 28th, 2012, 48-year-old Chinese architect Wang Shu was awarded the most renowned architectural award, the Pritzker Architecture Prize. His buildings were praised particularly for “taking care of the environment”.2 Furthermore, his “feeling for materials” was emphasized, and his architecture firm with the programmatic name “Amateur Architecture Studio” was mentioned, the name referring to the specifically Chinese reality of spontaneous, illegal and provisional building. As Mark Siemons explained, “on the coast which is often hit by typhoons, [Shu] watched people who, when rebuilding their houses that had collapsed from the storm, often pieced the bricks together simply as they found them, due to lack of time and money.” Appropriately, Shu himself “often uses recycled bricks (fig. 3). For the roofs of the Xiangshan Campus of the Hangzhou Art Academy he used more than two million tiles which had been saved from demolished traditional buildings in the province.”

That same February saw the publication of Christian Kracht’s much-debated and much-reviewed novel “Imperium (Empire)”, the colonial plot focusing on the dropout August Engelhardt. In 1902, Engelhardt emigrated from there to German-New Guinea (Papua-New Guinea), to the island of Kabakon in the Pacific Ocean, to run a coconut plantation and to found a society of naked, god-like sun worshippers, the “Sonnenorden-Aquatoriale Siedlungsgemeinschaft (Sun Order Equatorial Settlement Community)” whose members were supposed to live as vegetarians, more precisely: exclusively on coconuts. They considered the coconut not only to be food in respect of its milk, its fat and its pulp, also its fibres were supposed to be used for mats, roofs, ropes as well as the wood for furniture and houses.3 According to the novel, the first of

URL: http://www.spiegel.de/kultur/gesellschaft/0,1518,817944,00.html (Status: 2013-08-28)
5 Kracht (comp. fn. 4), p. 20.
Engelhardt’s huts was built in the native’s fashion in which roof and walls were made of palm leaves (fig. 4).  

As a final current example I would like to present the new residential towers, the vertical garden cities of the Woha architecture firm in Singapore, which – also in February, 2012 – were considered perfect examples of “condensed, resource-friendly and community-supporting building” in a newspaper article (fig. 5). Just recently, these buildings and designs were at display in Frankfurt, at the exhibition entitled “Breathing Architecture” by the Deutsches Architekturmuseum (German Museum of Architecture). In the case of the large buildings in Singapore and Bangkok the architects transfer elements of traditional Indonesian and Malaysian village structures, Kampong. These one-storey, elevated wooden buildings with far protruding roofs as a protection from sun and rain are characterized by their rooms being open and airy, by including shady plants as well as by a combination of private, semi-public and public spaces. In case of the Moulmein Rise tower block in Singapore, built in 2003, the two architects transferred the air-conditioning techniques of traditional longhouses on Borneo onto a slim, one hundred metres high residential tower, by constructing monsoon windows at the bottom of oriels, so that they may be opened even during extremely heavy rain.

The 36 storeys Newton Suites (2007) were designed by the architects as sky village segments with four storeys each. Following the example of village communities, semi-public exploration and open spaces were built, also sky gardens with trees on every fourth floor and one hundred metres high, green-clad walls, which are supposed to improve the micro-climate of the tower block. As a result of the house being perforated by gardens, terraces, balconies, and paths, the air is allowed to circulate in-between the flats, so that despite the tropical heat of up to 32° C no air conditioning is needed.

Two considerations arise from the outlined current publications: 1. It seems as if the end of utopia, which has often been claimed after the failure of Real Socialism twenty years ago (and before), did not happen. Instead, obviously we are in the midst of a renaissance of utopia or a renaissance of political considerations concerning alternative ways of human cohabitation. 2. These renewed approaches of utopian thinking deal particularly with architecture and problems of housing, stimulated – as always when it comes to utopias – by the problems of the society of origin, that is our time.

In how far, however, this way a so to speak ageless constant of the relation between architecture and utopia becomes obvious, when this started to be expressed in which ways, and which elements have been added as a result of the respective contemporary societal changes, shall in the following be discussed from six points of view: 1. It is about the two variants of utopian design, 2. about their architectural counterparts, 3. about architectural condensation in the context of castle building, community housing or large-scale housing as well as about the thus-connected architectural implementation of the demanded equal rights of the sexes and the emancipation of women, 4. about the greening and thinning-out of cities while following the model of the garden city and the thus-connected propagation of the nuclear family, 5. about utopian architectural models in the context of ecology and sustainability as well as enabling of most different ways of life, 6. I shall try to answer the question concerning the presence of utopia in contemporary architecture.

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1. The two variants of utopian design

For long, utopia research has been working with two models of utopian design: the ideal types of archistic vs. anarchistic utopia. By the keyword archistic we summarize the model of alternative ideal societies introduced into the academic debate in 1855 by Robert von Mohl, who characterised these societies by referring to the “Staatsroman (political novel)” and the therein projected development of repressive state institutions for the regulation, organisation and control of the individual’s life in every field. In 1906 Andreas Voigt contrasted this model to that of an anarchistic utopia of absolute personal freedom combined with the complete absence of any kind of rule.

Both models can be traced back to patterns from antiquity. Rightly so, most of all Plato’s “Politeia” is considered the ancient original pattern of the archistic design of society, whereas the anarchistic type of utopia must be traced back to those myths and poems telling about people outside the realm of civilisation, referring to them as “noble barbarians”, as Herodotus does, or as the herdsmen of the “Golden Age”, as Hesiod does. Striving for a cooperative relationship, the anarchistic type of utopia represents a life according to and in harmony with outside nature. There is no need to subdue the latter, but by a natural automatism the humans will be supplied with everything they need for a good life.

2. The archistic and the anarchistic traditions of utopia and architectural ideas connected to them

Here the first utopian model of a state, Thomas Morus´ Utopia, published for the first time in 1516, shall be exemplarily referred to regarding the architectural designs it propagates. By his criticism of the social and political wrongs of European society in the 16th century, probably referring to ideal constructs of the city, Thomas Morus´ ideas of urban development went far beyond those of his ancient idol, Plato. He did not develop his design of the world on the basis of the existing situation but broke with traditional models, so to speak letting the community grow from a tabula rasa. Accordingly, his alternative model of a society was based on rational planning and purposeful construction. The expression and symbol of his design of the city, which was no longer obliged to hierarchical qualities of being but to reasonable, secular rationality, was his way of constructing the city by calculable basic figures such as square, rectangle or circle. For example the city of Amaurotum on Utopia Island is depicted as a strongly fortified city with a square ground plan.

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“The entire city is [furthermore] [divided] into four districts of the same size”, each of which having a market square in the centre, “where the goods are collected in stores and magazines, to be distributed according to need”.13

Not only plan, appearance and structure of the city are characterized by the highest degree of homogeneity and rationalistic planning, but even every single house. These are type houses that are built in long rows consisting of several blocks. Each house has three storeys, a “front gate to the street” and a “backyard gate to the garden”.14 To the interchangeability of these standardised houses fits that the inhabitants are supposed to change house every ten years, just as the lack of any private sphere and individuality for the Utopians.15

Although Morus supposed the realisation of his model of society to be connected to extensive mechanisms of order and security, the latter were accompanied by a change of socio-political conditions. Accordingly, as the core of the constitution of Utopia he emphasized public property as the foundation of all economy.

The full breakthrough towards anarchist utopia and the appropriate change of architectural paradigms can be observed at about the turn from the 17th to the 18th century, in Fénelon’s educational novel “The Adventures of Telemachus” (1699).16 The people in Fenelon’s utopian Baetica live in harmony with outer nature. Also, the Baeticians reject all “architectural arts” as being useless, “for the simple reason that they don’t build houses.” “Without houses they live in tents made of furs or bark, like nomads in the desert or like Indians on the American prairies.”17 However, Fénelon’s model of Baetica is also anarchistic in the sense that state-inaugurated ways of repression will completely disappear together with the state’s disappearance, as all conflicts are solved in the context of the extended family.

Without problem, this reference to the Native Americans may be accompanied by that to the ancient Greeks and their architecture in those days.18 Since the return to antiquity in the age of Italian Renaissance, the only preserved written theory of architecture by Roman architect and engineer Vitruvius from the 1st century BC, “De architectura libri decem”, was the valid foundation of Renaissance architects and theoreticians of architecture. In his teachings Vitruvius drafted the idea of the primitive hut which the humans had “made of clay or slips … for their homes” after their sociation as the starting point of the art of building (fig. 6).19 Later, after improving their skills, says Vitruvius, the humans did not build huts anymore but houses and finally temples.20

20 Vitruv (comp. fn. 19), IV, 2, p. 98f.
Thus, in his understanding it was the primitive hut that marked the beginning of all architecture and particularly of ancient column architecture. In the mid-18th century the Jesuit, later Benedictine priest Abbé Marc-Antoine Laugier demanded, in the most popular treatise on architecture of the time, a return to nature, no longer considering the symbol of the primitive hut as the nucleus but the model and reference point of architecture.\(^{21} 22\)

3. Architectural condensation in castle building, community housing or large-scale housing

In his novel “Gargantua and Pantagruel”, which was consecutively published from 1543 on,\(^{23}\) Francois Rabelais developed a utopian model, which at first sight, from a socio-political point of view, looks like the countertype to the predominant archistic pattern of the Renaissance. Liberated from the compulsions of material reproduction, a small courtly avant-garde realizes her individualism to full extent in an absolute self-determination. At Thelema Abbey, the rule of the Order consists of one single paragraph: “Do as you like!”\(^{24}\) Accordingly, also the relations among the sexes are depicted as being completely free of domination and based on equal rights. Free humans, as is the argument, will be virtuous by themselves. Thus, Thelema Abbey seems to meet every criterion of an anarchist utopia. However, the individual’s autonomy is limited to the courtly society, whereas the mass of the population stays to be socio-economically dependent. Above all, the instrumental relation to nature becomes obvious by the architecture of the utopian space Thelema Abbey is based on: It is as fixed to a geometric structure as it is the case with the archistic type of utopia in the ages of Renaissance and Enlightenment. Accordingly, the building of Thelema Abbey is “a hexagon, at each corner there was a huge, round tower, sixty steps in diameter, all these towers had the same size and shape […]”.\(^{25}\)

Basically, Rabelais describes a very huge, regular, four-winged Renaissance castle. Obviously, what he has in mind are those castles in his immediate home region, the Loire Valley, which were then just being built.\(^{26}\)

Thus we see: Even in Rabelais’s type of utopia, which is anarchist if measured by socio-political criteria, the architectural elements of the classical utopia of the age of Renaissance appear once again. What is new, however, is the fact that no longer the outer subjugation of nature – as it is the case with contemporary anarchist utopias – comes along with inner disciplining.

Three hundred years later, in 1822, Charles Fourier for his cooperatively organised residential complex for 900 to 2,000 people, a phalange, used the Baroque castle with main building and two wings as a model (fig. 7). Once again, Fourier connected the reshaping of the geometric pattern of the Baroque castle into the communicative architecture of the phalange with the goal of sustainable naturalisation of the environment, where work and leisure are combined to form a playful synthesis. In this context, one essential consequence of the hegemony of the pleasure principle he emphasizes is the emancipation of women in the context of a liberalised sexual morality.

At the beginning of the 20th century, the concept of the community house played a crucial role for the discourses on New Man and the kind of urban planning which was supposed to meet his


\(^{25}\) Rabelais (comp. fn. 23), p. 173.

\(^{26}\) Rabelais (comp. fn. 23), p. 170.
anticipated needs as well as for the architectural design of his environment especially in Soviet Russia or the Soviet Union. This becomes particularly obvious by the narrations, lectures and publications of Alexandra Kollontai, that Russian revolutionary, diplomat and author who was the first woman to be a member of the revolutionary Soviet cabinet and, as a people’s commissar, eased the marriage law in the nascent Soviet Union, improved maternity rights and spoke out in favour of communal kitchens, collective child education and free love. What makes Kollontai’s emancipative approach so radical is that her concept of liberty was supposed not only to pave the woman’s way towards the world of work, thus making an end to “household slavery”, but also to replace patriarchy by the woman’s sexual autonomy. The projection surface of Kollontai’s utopia of a new way of living, however, was the community house. Analogously to the project of individual and collective emancipation, which step by step became more concrete, we must distinguish the transition house from the completed community house. The first category took the Marxist thesis into account according to which the dying-out of the family would be a long-term process. Thus, the state did not propagate the complete abandoning of individual households but made compromises with traditional ways of housing.

As the most famous example of such a transition house, in most cases the residential building on Novinski Boulevard in Moscow is given, built in 1928-1930 according to plans by Ginsburg and Milinis. A six-storey, longitudinal building on supporting pillars (fig. 8) with functionally differentiated flats of different size and places for municipal services and economy, roof garden and a glass passage on the first floor. Thus, unmistakably the so-called Dom Narkomfina anticipated elements and outer shape of Le Corbusier’s Unité d’habitation in Marseille from 1947-52. It was followed by further realisations in Moscow, such as the community house by the architects Wolfenson, Aisikovitch and Wolkov that resembles Fourier’s Phalanstère (fig. 9).

4. The reduction of the compactness of cities and their greening by the example of the garden city and the propagation of the nuclear family coming along with it

In his treatise “To-morrow: A Peaceful Path to real Reform” from 1898 the Parliament and Court stenographer Ebenezer Howard developed a model of a garden city to work against rural exodus resulting from industrialisation and the thus connected urban decay of London. His ideas came from two lines of tradition: The utopias of the 19th century and the single-family-house in the green, a product of the Victorian culture to take family life out of the narrowness and disorder of the big cities.

Against the background of the social situation of those days, Howard assumed different “forces of attraction” of city and country, whose advantages and disadvantages he believed to be ideally eliminated by a third possibility, that of the “Town-Country”. He designed the latter as an independent city on a circular ground plan with a diameter of 2 km for a maximum of 32,000 inhabitants. (I am sorry for not being able to give further details here.)

How far, on the other hand, utopian novels were influenced by architectural concepts is demonstrated by Howard’s idea of the garden city soon being included into Emile Zola’s (1840-1902) second to last novel “Le Travail” (1901), where he tells about the transformation of a city dominated by steel mills into the “city of the future”. Zola’s labour utopia had great impact on the field of architecture. Between 1901 and 1904 Tony Garnier worked out the project of a modern

industrial city (exhibited in 1904; published on 164 tables in 1917). Both by its overall concept and by developing architectural series and types, Tony Garnier’s industrial city influenced the architects of the modern age, such as Le Corbusier, among others (fig. 10).29

In the early Soviet Union the model of the garden city was discussed and propagated as well. Accordingly, the early post-war years of the Soviet Union were dominated by garden cities, based on detached houses in combination with community houses, which were erected in the context of the building of industrial complexes outside the cities (fig. 11). Later, by the sociologist Mikhail A. Okhitovich’s concept of the “new kind of settlement”, disurbanisation or the “green city” and thus the concept of the garden city was still present. Then the dramatic shortage of building materials at the end of the 1920s resulted in a number of experiments with standardised new wooden elements of waste materials from the industry, which were used for producing residential buildings from prefabricated parts. Wooden houses with a low number of storeys were built, such as in 1930 based on designs by the architects collective around Ginsburg (fig. 12).

5. Utopian models of architecture in the context of ecology and sustainability

Even after World War II the tension between archistic and anarchistic types of utopia went on. Since the 1960s, the latter experienced an unpredicted revival due to the beginning ecologic crisis, women’s emancipation and the experience of the totalitarian regimes of the 20th century. Ursula K. Le Guin gave in her novel “The Dispossessed” exemplary expression to these trends. By using the example of Planet Terra she demonstrates what may result from misusing nature and her reckless exploitation: Ancient Earth is destroyed, there are no woods anymore, the air is poisoned, the skies are grey and the climate is constantly hot. In contrast to that, the inhabitants have chosen a desert-like country as their habitat, whose barrenness renders impossible any reaching back to the ancient idea of “Nature as an automaton” with their new, anarchist Planet Anarres. The survival of the Anarresti seems to be possible only if, by networking with the living beings of their environment, they carefully adjust to a barren planet.

The new utopian settlements following Le Guin’s model have only little in common with the ideas of urban development in the 20th century, with its demands for the separation and reorganisation of the functions of living, working, leisure time and traffic. Concerning residential buildings, the principle of the interchangeability of their elements is dominant; thus they are similar to each other, simple, solid, made of stone or cast high temperature insulating brick. At the same time, the highest principle regarding design and building construction is adjustment to the conditions of Nature. Due to the frequent earthquakes, the buildings are, although of different size, exclusively one-storeyed.

Furthermore, the utopian novel “Ecotopia. The Notebooks and Reports of William Weston” by Ernest Callenbach (1975) belongs to the socio-political context of the first half of the 1970s. A decline in population seems necessary as prerequisite of the described emancipation project of some US American federal states in Utopia, “to limit the exhaustion of the natural resources of raw materials and the pressure on flora and fauna as well as to increase the general quality of life”.30 Instead of the big cities of the past new towns with a maximum of 40,000 to 50,000 inhabitants, connected by their own transit networks, developed. “Old quarters were given up and demolished, the thus gained open spaces were used for parks and woods.”31 At the same time, a sustainable naturalisation of the big cities started. The skyscrapers in the city centres, the former corporate

31 Callenbach (comp. fn. 30), p. 85.
headquarters, were changed into residential buildings. Pedestrian bridges were set up between them in the height of the 15th or 20th level.32 The new towns, so called “neighbourhoods”, consisted of three- to four-storey wooden houses, grouped around yards, with planted rooftops and balconies.33 In these neighbourhoods the centre formed not the city hall but a factory, which produces ecologically compatible equipment. Most of the buildings in Ecotopia are made of the country’s favourite material, which is wood. However, wooden houses are difficult to construct, and the material is costly. That is why the so-called “press-house” gains more and more significance. The name refers to industrially produced synthetic plates or tubes which can be bought in the form of closed cavities or with blanked out windows.34 If necessary, the Ecotopians may use them as modules and thus themselves compose them to form the most different types of house.35 The size of the flats is meant for communities of 5 to 20 members, for societal transformation has led to the dissolution of the nuclear family. It has been replaced by the patchwork family, where everybody contributes to bringing up the children. Still, there are “families” without children, most of which are based on working in the same profession. With up to 40 members these are much bigger, and live in community houses with common kitchens, studies, gyms and residential libraries.36 In Ecotopia the emancipation of women has made much progress, also concerning sexuality.37 Appropriate to the emancipatory idea of life is the habitus of the female head of government, who practices a communicative way of governing. Sustainability, care for resources, and the endless cycle of biodegradable materials are those normative postulates, which must not be violated by any Ecotopian.38

6. The presence of utopia in contemporary architecture?

Apart from the far-away extremes of the architectural models of archistic and anarchistic utopias, of the condensed stone city with straight-running streets and uniform semi-detached houses or blocks of houses on the one hand and the simple hut made of natural materials on the other, the utopian novels also know mixed models. Either they keep the architectural pattern of planned or ideal cities, just socio-politically tending towards the communities being free of domination, or vice versa the presented architecture takes up anarchistic naturalisation tendencies while keeping up rather traditional types of society. In particular these mixed models tell about the social or urban-development innovations of the respective times or reveal the demands on architecture and housing in the face of societal change. For example Rabelais, by his Thelema Abbey, makes equal rights for the sexes and the emancipation of women topics of discussion, which then, from the 18th century on, were to become crucial topics of literary utopias and later also for overall society. At first architecture reacted to this by large residential units modelled after the castle, until finally the community house was developed as the 20th century’s architectural answer to the final dissolution of the nuclear family.

Starting out from the anarchist architectural tradition of the simple hut and the naturalisation paradigm of the 18th century, the ideal of the modest, small house in the green is developed, which may be considered an answer both to industrialisation, increasing rural exodus and the thus connected urban decay of the big cities, to environmental pollution, noise and traffic in the city as well as a way of protecting the nuclear family. Insofar, at an early stage these naturalisation models discuss ecologic problems, which then, in the second half of the 20th century, come to the fore again.

33 Callenbach (comp. fn. 30), p. 35.
34 Callenbach (comp. fn. 30), p. 164.
35 Callenbach (comp. fn. 30), p. 179.
37 Callenbach (comp. fn. 30), p. 88.
38 Callenbach (comp. fn. 30), p. 104.
In ecologic terms, these utopias are architecturally answered by a withdrawal from modern age urban development and its separation of functions and the accompanying suburbanisation, that is “back to the city”. This happens between the extremes of the simple building on the one hand and the residential machine of the Le Corbusier kind or the skyscrapers of the big cities on the other. In between, so to speak as mediators, the multi-storey wooden buildings or synthetic press-houses of the small towns, accompanied by ways of living of most different size and composition, exist. Here the care for resources, sustainability, biodegradation and recycling were added as central demands to architecture.

Referred to the initially presented architectural examples, it seems as if the literary utopias anticipated all those innovations in the fields of architecture, urban development and living as being mentioned in the arts sections of newspapers and magazines, insofar as they are supposed to provide answers to problems of our time. Accordingly, both the boxrooms of the press-houses and the recycling of building materials, such as in the case of Wang Shu, or his orientation at houses being built by laypeople were pre-formulated in Ecotopia. Even the bridge-terraces of Woha or the sky gardens, which are integrated in skyscrapers, have been basically propagated, however in this case contemporary architecture goes even beyond the imaginativeness of the utopias. However, the crucial points of human co-existence are obviously the problems of the possibility of retreating to the private sphere without this sphere becoming isolated, semi-public or semi-private spaces for the inhabitants to encounter each other both in buildings and in green zones.
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Picture credits

Fig. 1: http://www.artistsparadigm.com/2012/03/moriyama-house-sanaa-ryue-nishizawa.html, Status: 09.10.2012

Fig. 2: http://www.artistsparadigm.com/2012/03/moriyama-house-sanaa-ryue-nishizawa.html, Status: 09.10.2012


Fig. 4: Post card Kabakon, Owner: Dieter Klein, Scan: Marc Thümmler.

Fig. 5: 091 Duxton Plan_view out of ps with trees below, WOHA Architects Pte Ltd., 2012.

Fig. 6: Kruft, Hanno-Walter (1985). Geschichte der Architekturtheorie : von der Antike bis zur Gegenwart. München: Beck, fig. 92.


Fig. 9: Gradow, Georgij A. (1970). Stadt und Lebensweise. Berlin: Verl. für Bauwesen VEB, p. 53, fig. 27.

Fig. 10: Garnier, Tony (1989). Die ideale Industriestadt. eine städtebauliche Studie. Tübingen: Wasmuth 1989, p. 106, fig. 82.


Appendix

Fig. 1: Tokyo, Moriyama House, by Ryue Nishizawa, 2005. Photo: Takashi Homma. Copyright: Sanaa.

Fig. 2: Tokyo, Moriyama House, Modell, by Ryue Nishizawa, 2005. Copyright: Sanaa.
Fig. 3: Ningbo, Ningbo Historic Museum, by Wang Shu, Amateur Architecture Studio, 2008, Photo: Iwan Baan.

Fig. 4: August Engelhardt, Founder of the „Sun Order“ in front of his hut on Kabakon, around 1910, Copyright: Dieter Klein.
Fig. 5: Singapore, Duxton Plain Public

Fig. 6: Marc Antoine Laugier, the „Primitive Housing, by WOHA 2001/2002. Sky Hut“, Frontispiece to the second edition of Villages with Sky Streets, Sky Parks. „Essai sur l'Architecture“, Paris 1755.
Fig. 7: Draft of a Phalanstère, Reproduction by August Bebels work on live and theory of Charles Fourier, 1907.

Fig. 8: Moissej Jakowlewitsch Ginsburg and Ignati Frabzewitsch Milinis, Apartment House at Nowinski-Boulevard in Moscow, draft, 1928-1930.
Fig. 9: Georgi Jakowlewitsch Wolfenson and Samuil Jakowlewitsch Aisikowitsch, J. Wolkow, Project of a community building in the Chawsko-Schabolowsker Alley in Moscow, 1929.

Fig. 10: Tony Garnier, Une cité industrielle, residential district, view.

Fig. 11: Nikolai Wladimirowitsch Markownikow, Tenement of the cooperative housing estate "Sokol" in Moscow, total view, 1923.
Fig. 12: Michail Ossipowitsch Barstsch, Moissej Jakowlewitsch Ginsburg. Experimental model of a living unity in natural size for a Green City (Seljony Gorod).
Antecedent and Development of Adire in Southwestern Nigeria

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Abstract

Adire, an art form and the patterned resist-dyed cloth of the Yoruba of Southwestern Nigeria are extant, dynamic, widely practiced and ubiquitous. This art has suffered systematic scholastic neglect, due to the initial scholarly attention to sculptural art traditions. Challenges such as, technological and technical changes through foreign contacts, competition from cheaper imported fabrics, inconsistent government policies, and the ephemeral nature of the material of Adire, among other challenges, threaten the continuation of the art and its history, and made its study expedient. The study, an art historical analysis, investigated the origin, history, spread, centres, materials, techniques and technology, and also analyzed the motifs, iconography, thematic peculiarities and usage of Adire of the Yoruba over the period of time. Based on direct field research, it has drawn largely from few available literature materials, visual art materials in private and public collections, in fabric markets, and critical observations of the artists and their works. Introduction of cotton fabric, synthetic dye, and drum receptacles into Nigerian market from 1880 to 2012 aided multi faceted innovations and consequent dynamic development of Adire. There was also a shift from female domination to male participation and organic growth in styles and their diffusion of the art across centres. Development in motifs, and shift in patronage are also discernable and highlighted. These developments have been classified into five periods of a each. Through Adire, the textile art has contributed significantly to the Nigerian economy and a sound textile industry will substantially uplift the nation’s economy.

Keywords: Adire, Antecedents, Developments, Nigeria, Southwest
Introduction

The Southwestern Nigeria is the home of the Yoruba, whose population is about 30 million. They constitute over 21% of Nigeria’s population (CIA World Factbook, 2008).

Cloth is significant in the Yoruba culture. Appropriateness of the dress for any given occasion for which it is worn is also emphasized. Nudity is abhorred and is believed to be tantamount to abject poverty or insanity. Their aesthetic appreciation is therefore related to both human character and physical appearance, as portrayed especially by cloth.

Adire, an art form and the patterned resist-dyed cloth of the people are extant, dynamic, and widely practiced. The origin of Adire is not certain, and a few number of scholars have attributed its origins to accidental discovery (Polakoff, 1982 and Larsen, 1979). This is not probable as traditional origin suggests deliberate and local origin of the art. Nonetheless, archaeological finds that have been radio carbon-14 dated to the eleventh century (Sieber, 1992 and Bolland, 1992) from the Tellem burial caves of Mali discovered in the 1960s, yielded an indigo dyed cap with a pattern similar to Osubamba motif used in the Adire art of the Yoruba. In addition Kalilu findings (1992), and observations on the spread of the art of Old Oyo Kingdom and empire, all hypothetically point to the Yoruba as the origin of this art tradition.

The Adire art tradition has suffered systematic scholastic neglect as a result of the initial scholarly attention to the sculptural art tradition of the people. But future indepth studies on Adire are expedient. This is because of certain problems such as, technological and technical changes brought about by contacts with foreign influences, competition from cheaper imported fabrics, inconsistent government policies, and lack of young persons (girls) willing to learn the art, which is considered tedious that all militate against the development of the art. Further to these are the problems of the ephemeral nature of cotton which is the canvas of Adire production, the individualistic nature of the art which when is bought is used as utility by individuals, and thus not a public art with a collection for public viewing. Finally Adire is becoming obsolete as it is considered an ordinary cloth for ordinary people, and does not carry the same prestige like Aso Ofi, the Yoruba hand woven cloth (Picton, 1992). All the foregoing therefore makes the study of Adire expedient.

Based on direct field research, this study, an art historical analysis of Adire, of the Yoruba of Southwestern Nigeria, covers the six states of Oyo, Osun, Ondo, Ekiti, Ogun, Lagos and parts of Kwara and Kogi States. It studied the antecedents and developments of Adire over fifty-five years; between 1957 and 2012. It chronologically traced the epochal moments of Adire art practice and tradition. It also analyzed the technical, technological, thematic and socio-cultural changes that occurred within this period by investigating the origin, history, spread, materials, techniques and technology of Adire. It also critically analyzed the motifs, iconography, thematic peculiarities, usage of Adire and effects of socio-cultural changes, governmental policies on the art and the impact of the art on the nation’s economy over time. The study has also drawn largely from the few available literature materials, oral tradition, and visual art materials in private and public collections, and fabric markets in the study area, as well as critical observation of the artists and their works.

Although the systematic study of Adire is recent, literature materials nonetheless abound on the various aspects of the arts and textile tradition of the Yoruba. These literature materials fall into six different categories; writings by early explorers who visited Yoruba land, works of historical significance that mentioned textiles and Adire of the Yoruba and works of socio-cultural significance that mention Adire. Others are; works on Yoruba art that mention Adire, works on Yoruba textiles, and works on Adire.

Early explorers such as Mungo Park (1799), recorded seeing vast cultivation of cotton of quality “well thought of in the Liverpool market” (Milson 1891), and a vibrant textile industry with
cloth being a product of exchange in Old Oyo (Clapperton 1829). All these portray a long standing textile tradition among the Yoruba.

Works of historical significance by Johnson (1921), Ogunba (1973), Oyelola (1981), Boser-Sarivaxevanis((1948), Adenaike(1993), and Perani (1992), differently made mention of Elu, the indigo dye of the people, focused on the socio cultural changes in Adire art tradition and other crafts, and the manufacture of kura, the gauze of the Hausa. Writers such as Fadipe (1991), Sofola (1973), Poyner (1978), Borgatti (1983), Buhler (1951), Polakoff (1982), Gillow and Sentence (1999), severally focus on the people’s socio-cultural life in relation to textiles, and not on Adire specifically.

Works by Willet (1958), Ekpo Eyo (1977), Callaway (1964), Bascom (1969), Fagg (1971), Wahlman (1974), Eluyemi (1970), Adepegba (1995), Bray (1976), Sieber (1973), and Kalilu (1992), have been the bedrock of scholarly studies, and insightful into the artistic wealth of the Yoruba and their early usage of clothing. None of the works specifically dwelt on Adire, its motifs and the period covered by this research.

Publications on Adire by Eicher (1976), Boyer (1983), Scot (1983), Aig-Imoukhuede (1969),Stanfield (1971), Oke (1971), Barbour (1971), Jackson (1971), and Areo (2005), grouped and described the basic process of making Adire, the preparation and chemistry, the challenges and prospects of indigo dyeing, types of design and costing of the finished work. Similar works by Brooks (1971), Taylor (1975), Larsen (1976), Barkley (1980), Vol (1982), Bayfield (1993), Oyelola (1981), Beier (1993), and Wolff (20001), all discuss Adire but none have indepthly studied the motifs and the changes that occurred in the last fifty-five years. Though the foregoing publications have contributed generally on the art of the Yoruba, and the socio economic aspect of Adire, but they left out index studies of the thematic, technological, technical and historical changes, thus making the study expedient.

Centres and Spread of Adire

Indigo dyeing is traditionally found to a large extent in most Yoruba towns. Large Yoruba cities that have been noted for Adire are, ‘Ibadan, Ede, Ondo, Osogbo and Abeokuta. However, the people of Osogbo in are in the contemporary periods regarded traditionally as good dyers and the town is regarded as the ‘home of dye’: hence the Yoruba’s appellation for the town; Osogbo ilu aro. TheYoruba saying ‘Aro mbe l’ Osogbo, omo eniyan ni mbe nile Ibadan’ that is, It is dye (indigo) that dominates Osogbo, while large human population dominates Ibadan (1971), corroborates the preeminence of Osogbo as an indigo dyeing centre in Yorubaland. Of the four notable producing centres that once existed in the town, only the Aka dyeing centre at Opo Ile area near the Oba’s palace still exists.

Historically, Adire was introduced into Abeokuta in the early part of twentieth century by the Egba settlers who returned to Abeokuta from Ibadan which was hitherto their base (1971). Though the Egba dyers were not very good at the beginning of the twentieth century, they learnt so quickly that eighty per cent (80%) of the cloth trade in the town was Adire by 1933 (Egba National Council). This tremendous growth has turned Abeokuta into the real important centre of Adire.

Sixteen family compounds traditionally were noted for dyeing in Ede. Of the sixteen family compounds, only the Akoda centre of the Akoda family is still in operation, being run by old dyers aged between fifty and eighty years, and with no young apprentice learning the trade. The other fifteen centres gradually stopped practicing with age and demise of the Adire artists from the middle seventies till date.

As a result of the nineteenth century Yoruba civil wars, many migrants artisans, dyers and specialists in other textile art migrated to Ibadan and settled in different quarters of the town (London Religion Tract Society, 1877). There were dyers compounds all over the city where a large number
of them settled at Idi Aro. As a result of this influx of artisans, cloth consequently ranked among the most vibrant craft industry in Ibadan during this period (Falola, 1976). However, only two of such traditional centres still exist in Ibadan.

Though Eluyemi (1978), identified seven traditional indigo-dyeing centres in Ile-Ife in the 1980s, none is in existence in the town as of the time of this research. There are however numbers of synthetic dye - using centres in the town.

Similarly, Perani (1992) records that many weavers, dyers, and other artists moved to Ilorin and other Yoruba towns at the collapse of Oyo Ile in 1836, and that indigo dyed yarn for Etu, the indigo coloured woven strips, was one of the products of the weavers in this town, but no indigo dyeing centre presently exists in Ilorin. The patronage of the only dyer identified is skeletal, and is largely by herbalists, who use the exhausted dye solution in preparing herbal antidotes for poison, and by those who want their yarns pre-dyed for Etu. There are a few synthetic dye - using centres in the town whose trainings are traceable to Abeokuta, Osogbo, academic institutions and textile workshops.

Workshops of the middle 1960s to the middle 1970s such as Mbari Mbayo in Osogbo and Ori-Olokun in Ife have blossomed into many centres engaging in contemporary Adire practices using new materials, techniques, and the training of other dyers. Among such centres is the Nike Art Gallery, Artists Cooperative and Heritage Gallery, all of which are located in Osogbo. These centres are owned by the products of the Mbari Workshop or those who learnt the art from them. Added to this pool, are university graduates that learnt resist dyeing techniques in the universities in the 1970s; among such artists trained in the University is Margaret Olugbemisola Areo whose workshop also trained school leavers.

As a result of the economic downturn, and the resultant unemployment in Nigeria, many skills acquisition centres have evolved. Government establishments such as academic institutions, the National Directorate of Employment (NDE), Centre for Art and Culture, the National Commission for Museums and Monuments, non-government organizations, such as Alliance Francaise and charity spirited individuals periodically organize Adire making workshops to reduce youth restiveness and unemployment in the society. Such workshops are considered part of the contemporary centres of Adire considered by this study. Many of these workshops are however fluid, temporary and non-permanent in nature.

Materials, Methods and Tools of Adire production

The Adire art tradition has been kept alive inspite of many daunting challenges by the ability and efforts of the Adire artists to adapt new materials, techniques, and technology for their art. The factors of material, technique and technology have been the three major agents of change and innovation in the Adire art tradition in the last fifty years.

Materials of Adire production are many, but cloth and dye are indispensable in Adire production. Cloth is actually a motivating factor for the Adire artists. And where other art traditions, such as sculpture are going obsolete among the Yoruba, there has been continuous dynamic and evolving tradition in the textile art (Picton, 1992). Cotton, the basic raw material of Adire is cultivated in vast quantities among the people and the manufacture of cotton cloth dates back to the advent of European travelers and explorers of the 17th century (Adepegba, 1995 and Eicher, 1976). The original prototype for Adire was therefore kijipa, the handwoven cloth of the Yoruba. However with the importation of cotton shirting and calicos between 1880 and 1925, a dramatic growth of Adire ensued. This was because the imported material were cheap, and had soft and smooth surface that encouraged tieing and stitching of smaller, definite patterns and is particularly suitable for constructing women body wrappers, the traditional measuring size of Adire (Wolff, 2001).
With the introduction of these fabrics however, by the 1960s, *Adire* was being sold by the yard, instead of as wrappers. Nonetheless in the contemporary time, every absorbent material is now being used by the *Adire* artist. The material on which the pattern is dyed distinguishes the *Adire* type. Consequently, there are those referred to as guinea Kampala, dry lace Kampala and so on.

Dye is another motivator of change in *Adire* production. Indigo dye obtained from the leaves of the *indigofera*, called *elu* remains the oldest dyestuff of world textiles traditions (Proctor and Law, 1992). Indigo dying is a specialized art among the Yoruba who are considered the most passionate lovers of indigo (Boser-Sarivaxevanis, 1980). The tedious process of its extraction has been described in detail by Stanfield (1971). Synthetic dye was however introduced into *Adire* market early in 1960s. Since that time, the art tradition has been witnessing changes as indigo dyers substitute the natural indigo leaves with imported synthetic indigo powder, because of the ease and speed of preparing the imported synthetic dyes. Secondly, the traditional receptacle of indigo dye which was clay pots has largely been replaced with metal drums, due to its durability and unbreakable nature, and the difficulty of obtaining ceramic pots large enough for indigo extraction. In a few number of cases, cement pots are used.

The introduction of multi coloured synthetic dyes resulted in old patterns being produced in more vibrant colours, different from indigo colour hitherto used. *Adire* which up till the 1960s was considered ordinary cloth for the poor, the old, and the rural women, was instantly adopted by the youths, as cloth of urban fashion. Furthermore, *Adire* art shifted from being a restricted and a specific family based art for women, to an art for all comers. There was also a shift in gender as many young male youths started producing *Adire* (Wolff, 2001).

*Adire* in the last fifty – five years can be grouped into six broad categories namely; *Adire* Oniko, *Adire* Eleko, Batik, Discharge Dyeing, Direct Application, and Factory Printed *Adire* based on the techniques and technology employed. Each of these categories has many variants under it.

*Adire* Oniko is the original method. This involves pattern - tying with *iko*, raffia threads. *Adire* Eleko, in its own case involves the usage of starch slurry to create patterns on the fabric. Its variants are freehand, stencilled eleko, eleko splash and lace eleko. Batik which on the other hand involves the use of wax was introduced into Nigeria by Susanne Wenger, an Austrian who settled in Osogbo. She adapted her knowledge in *Adire* Eleko into creating modern art form using starch, and later wax. Her effort in addition to that of Ulli and Georgina Beier led to the Mbari Mbayo Workshop in Osogbo which resultant effect is the vibrant batik artistry that is still extant in Osogbo today. Under this category are variants such as free hand, stamping, and Batik wax splash.

Discharge dyeing in its own case involves the use of bleaching solution such as JIK and Parozone to remove colour from an already factory dyed fabric. Textile students of the Department of Fine and Applied Arts of Ladoke Akintola University of Technology, Ogbomoso, Nigeria, have also succeeded in using stencils to produce patterns under this category.

Methods under direct application, involves application of dye on fabric. The pattern is determined by the folds created before the application of the dye. Some variants of this type are marbling, *wuruji* and spray gun patterns.

The history of foreign and indigenous textile mills printing imitation of *Adire* patterns is recent and not longstanding hence its being categorized as the last one in the categories; Factory Printed *Adire* is called Ankara kampala. Ankara is the Yoruba generic word for wax printed fabrics. Individuals such as Pat Morgan, an American resident in Nigeria operated a textile screen printing workshop named *Aladire* in Lagos, where she printed about 1,000 yards a week using traditional *eleko* motifs. This idea of printing traditional motifs was imbibed by the Textile Design Unit of the Department of Fine Arts of University of Ife, now Obafemi Awolowo University since the early 1970s. It is noteworthy that an array of new patterns has evolved through the combination of many of
the variants from the different categories. And through such experiments the Adire art tradition has remained vibrant.

**Iconography, Themes and Iconology**

The motifs of Adire are not an individual’s fresh creation, but have become standardized, accepted, and understood by the Yoruba through generations of use. They comprise of themes drawn from the people’s philosophy, religion, objects of day to day living, world of fauna and flora around them, and their reflections on events in a constantly changing world. These motifs run into hundreds (Wolff, 2001), and have been grouped into four (Areo, 2010). Those based on geometric shapes, all of which connote deep spiritual meaning to the Yoruba. The dot for instance is a point of light and blessing, a sign of human soul, and of power, uniting the destinies of each individual to specific divine forces (Drewal and Mason, 1998), while a circle represents the cyclic nature of man’s existence in a continuous existence of birth, death, reincarnation and rebirth.

The second are motifs based on figural patterns such as zoomorphic representation of plants and animals, which are significant and ubiquitous part of the Yoruba’s tropical and spiritual life. Copious usage of birds in Adire and other art traditions, for instance, is an acknowledgement of powerful female witches known as ‘iya mi,’ our mothers, who are capable of using their power for good or evil, and transforming into birds at night to travel to places beyond mere mortals’ ability.

There are motifs based on skewmorphic objects such as Isana (Matches), Ooya (comb), and others that highlight the constant changes in the life of the people. Lastly, there are motifs based on letters of the alphabet which evolved out of the people’s interest in education and the subsequent power it bestows in a Eurocentric world. Since many of the stencil cutters were not literate, the resultant motifs are almost indiscernible sentences that are cut without gaps between the words.

Since Adire artists merely produce patterns as it has been passed down to them, without an understanding of the meanings, the interpretation of the motifs were therefore based on findings by earlier scholars, and on personal experience and knowledge of the Yoruba culture.

**Typology, Production Chronology and Usage**

Adire’s origin is traceable to indigo dyeing of yarns meant for weaving, and rejuvenating of old faded cloth. It developed in the ninetieth century with the prototype made on Kijipa, the local hand woven strips of the women’s upright loom. These were joined either into women’s wrappers, men’s cover-cloth, or sewn into top and knickers for rough work.

By the end of the nineteenth century, importation of factory produced, cheap, plain and printed textile materials revolutionized Adire production. These were wide and very suitable for wrappers, and also soft and smooth for tying tinner and more precise patterns. This evolution coincided with that of hand painted Adire Eleko in Ibadan between 1880 and 1925 (Oyelola). Adire, made on brocade and velvet, were thus important articles of commerce in the 1930s (Beier, 1997). The period was notably marked by entrance of males into this hitherto female art tradition. They introduced stencil cutting into hand painted Adire Eleko, and sewing machine into hand stitched techniques, in order to save time. Adire, up to this period was made into wrappers. The period under study, 1957 to 2012, is reviewed at eleven yearly intervals and is based on peculiar characteristics of each period. Five periods are discernable. These periods are named as Post World War II, The Workshops Period, Post Workshops Ripples Period, Self-Employment Period, and Adire Boom Period.

The first, Post World War II period (1957-1966), was marked by the ban on exportation of cotton to Nigeria and resultant scarcity of cotton material for Adire production, flooding of the market with cheap printed materials from Europe, Asia, Japan and Nigerian textile mills, imitations of the Adire Eleko motifs by Japanese textile mills, and importation and introduction of synthetic
indigo and other brightly coloured dyes. Traditional patterns in bright colours were produced; Adire was sold by the yard, and also sewn into other items apart from the traditional wrapper. This appealed to foreigners and educated elites who wore Adire as shirts as sign of ethnic and national identity of the newly acquired independence. Other uses such as table cloths, bedspreads, draperies, western-type dresses, and men’s sport shirts featured at this period.

The Workshops Period (1967-1976) was marked by the ban on importation of textiles by the then Head of State, General Yakubu Gowon. Adire also became a backyard industry for many unemployed people. Workshops such as the Mbari Mbayọ in Osogbo, and Ori-Olokun in Ile-Ife, taught batik as an art form and in other forms, to youths. Pat Morgan’s industry, Aladire, commenced production of screen printed Adire Eleko motifs. Adire products during this period were used in furnishing, and making fashion statements by the youth. It was the cloth worn mostly by delegates at the Kampala Peace Conference to resolve Nigerian civil war. Adire was thus named ‘kampala’ after the venue of the conference.

Post Workshop Ripples Period (1977-1986), was marked by the emergence of workshop trained graduates who now established their own centres for producing Adire and training others. Festival of Arts and Culture (FESTAC ’77) was held with Adire costumes copiously showcased by many troupes. At its apogee, Adire during this period was used as chausibles by the visiting pontiff, Pope John Paul II and all the priests who offered mass with him in Kubwa, Abuja in 1982. 1983 marked the opening of Nike Davies-Okundaye’s centre for Arts and culture where indigo dyeing tradition was resuscitated.

Self-Employment Scheme Period (1987-1996), witnessed mass unemployment in Nigeria and the popularity of the National Open Apprenticeship scheme in which had been established since 1987 to stem this ugly trend. The period also witnessed the Oyo State Graduate Self Employment Scheme established by the then Oyo State Military Governor, Col. Tunji Olurin, of which many youths including one of the authors of this paper, Mrs. Margaret Areo, then a young textile graduate of Fine Arts of the University of Ife, was a beneficiary.

Lastly, the Adire Boom period (1997-2012), coincided with the time of President Olusegun Obasanjo as the democratically elected president of Nigeria and extends half a decade after he left office taking a peep into the relevance of Adire. He, more than any of the country’s leader before him encouraged the use of locally made materials especially the Yoruba Adire throughout his eight years tenure. Tagged “Obasanjo style,” his patronage lifted Adire from “cheap, ordinary cloth” to a cloth of prestige, and encouraged its usage among other eminent personalities in the society who hitherto abhorred or considered Adire too “cheap” for their status. By the end of this period Adire was so successful that it was used for virtually everything. Wedding gown, evening wear, and casual wear, were some of the projects Adire was used for by Textile students of Fine and Applied Arts Department of Ladoke Akintola University of Technology, Ogbomoso with tremendous success. The ripple effect of the popularity he as the country’s president gave Adire is still evidence.

Contributions of Adire to the Economy

Adire has been a source of economic independence for Yoruba women practitioners for centuries. At the zenith of its patronage Adire was sold as far as Senegal and Ghana as the least expensive coloured cloth (Bayfield, 1993). Records show that Senegalese merchants bought as many as two thousand Adire wrappers from Abeokuta daily in the 1920s (Wolff, 2001). And by 1926, 25% of the town’s population was involved in Adire production the peas. And by 1933, 80% of cloth trade in Abeokuta was Adire (Egba National Council). At k of demand, other Yoruba towns were not left out, Adire producers in Abeokuta took their cloths to Osogbo for dyeing, and Ede town supplied indigo balls, elu, the raw material of indigo dye to Abeokuta dyers (Akinwumi, 2008). Demand from Gold Coast, the present day Ghana. Spurred Ogbomoso textile traders to export Adire
to Ghana by 1910 (Sudarkasa) while Ibo traders of Southwestern Nigeria supplied Adire to the countries of Congo and Cameroon (Keyes-Adenaike, 2001).

Sale of the materials of Adire such as absorbent textile materials, traditional indigo dye balls and in contemporary times, imported multicoloured dyes and fabrics provide some people means of livelihood. Nigerian textile mills were also given a boost such that between 1960 to 1980s they provided employment for 25% of the country’s labour force (UNIDO, 2003). Fashion is a factor of clothing in Nigeria and all over the world (Ayitey, 1998), the fashion industry has also benefitted economically from the dynamic evolution of Adire.

Efforts by various informal art workshops, governmental and non-governmental organizations have provided means of livelihood for many young school dropouts who would have become societal menace. Finally the gender shift of Adire art from a female dominated art tradition into an all comer’s trade has provided economic relevance to many who were not biologically born into Adire producing compounds. Adire and its iconography have thus become means of expressing cultural identity, and providing the people a voice on matters of public interest.

Conclusion

The ephemeral nature of cotton, the material of Adire production, the individualistic nature of its collection, and constant change in fashion have all made a detailed historical construction in the last fifty –five years very difficult. Getting individuals with old samples was therefore not easy, and traditional markets of Oje in Ede and Ibadan once renowned for old samples of Adire seem to have been stripped of such samples by tourists. However, pictorial evidence from individuals, literary works; magazines and personal collection over the past three decades by these researchers have been of invaluable help in this exercise. Though, the origin of Adire is not known and may never be known until archaeological materials improve, the available materials nonetheless piece together a logical sequence from the hand-woven prototype to the myriad of patterns available in 2007.

Factors responsible for the dynamism of Adire are; appeal of indigo dye, novelty of synthetic dyes, new cloth, changes from clay dye pot to metal drum receptacle, demand for Adire, and the ingenuity of Adire makers to socio-cultural changes around them to mention a few.

There was also a shift from female domination of the art to male participation. Organic growth in styles and their diffusion across centres were apparent. Development in motifs from geometric through figural to skewmorphic are also discernable and highlighted. A shift in patronage from old women to users of all sexes and classes are also apparent and highlighted. These changes are highlighted and classified into five periods of eleven years each. Through Adire the textile art, has contributed significantly to the Nigerian economy. Adire is therefore a sound textile industry which will substantially uplift the nation’s economy.
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Abstract of the measurement system „Ionospektroskop“

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Abstract
In the following report, a case study will be addressed showing that how measurement precision and time can be greatly enhanced by the employment of modern digital measurement techniques and its linkage to mathematical operations. In both the fundamental research and in the practical production of technical devices, standards have to be satisfied when measurement devices are acquired to be used in the observation of individual processes. As an example we describe, hereby, our research of a partial ionospheric simulation by means of low-frequent cold plasma. The experimental set-up exists as a protected utility patent in the federal republic of Germany under the number: 20 2011 004 346.0.
Figure 1: overview of the middle components of the Ionospektroskop©

For example: if the task of observing the magnetic field variations in the ionosphere is targeted, one needs beside detectors for the ULF (Ultra Low Frequencies) a suitable amplifier, which is capable of amplifying the signals in all measurement ranges in a reliable and, possibly, undamped manner. This is for sure a difficult requirement to fulfill. Then a spectrum analyzer is needed, whose amplitude rendering in the range of 1 mHz allow an appropriate calibration. This is possible for example for expensive spectrum analyzers up to 200 kHz. For higher ranges above 200 kHz, other spectrum analyzers would be needed; for example up to 8 GHz. From 8 GHz (microwaves range) up to around 20 GHz, analyzers with special technical specification would be needed.

In this range and other higher ranges various possible noise signals exist, which can exert different influences on the quantities to be measured by its impulse-characterized sub-harmonic, harmonic and also nonlinear interferences.

Therefore it is very necessary nowadays for every manager of a measurement project to gain an overview of the overall spectrum of the electromagnetic waves. This holds also for all kinds of fields, which can be measured with different detectors: electrical, magnetic and electromagnetic fields. If the whole range from mHz to GHz is targeted to be acquired and rendered, many spectrum analyzers would be needed, which had to be consecutively calibrated.
Figure 2: The observation of the NULL-rate for particle counting and the display of voltage inductions by plasma currents by LeCroy 104Xi.

One difficulty which is often easily overlooked, lies in the adaptation between signal detectors, signal analyzers and their output ports to the computer. Especially in the case of a field measurement using laptops, by which different measurement values can result from the receiver antennas which are mounted inside the cover frame. The value deviations would depend of the cover tilting angle and this complicates any calibration effort, although they are normally equipped with software tools which suggest proper and reliable measurements (especially of alternating fields).

Therefore it had been for many years a key target of our work group to find a comprehensive calibrateable solution, which had also to reduce the measurement time which is very expensive when undertaken by „man-power“. Consequently, a successful employment of oscilloscopes and high-end oscilloscope for diverse tasks resulted from a cooperation with the company Teledyne-LeCroy over many years. The key criterion for this successful deployment was that all previously mentioned requirements of the measurement tasks (and especially for the overview spectra) were fulfilled and even preferably in an all-in-one device.
Figure 3: Measurement of the plasma variations by the Helmholtz coils (Left: signals, Right: FFTs)

Signal amplitudes ranging from mV to kV can be processed by 4 independent channels, whereby the acquired signals remain reliably constant in the form, frequency and phase besides wide triggering possibilities. Additionally, a variety of mathematical operations enable the user apply complex mathematical operators beside the discovery of possible hidden relationships between signal analysis magnitudes.
Figure 4: Measurement of the geomagnetic variations by the variations in the "Bounce Motion" based on the differential spectra approach
Figure 5: A recording of the plasma chamber with low-light amplification.

Figure 6: Plasma forming, stabilized, shot with a low-light amplifier.
Figure 7: LeCroy SDA 820Zi-A (up to 20 GHz with 40 GS/sec)

Figure 8: LeCroy SDA 820Zi-A shows an example of the measurement of discharge processes
In the following depictions and short overviews, it will be shown with which extent of precision and consistency did the products of Teledyne-LeCroy help the scientific research. The resulted outputs of this research were and are parts of shortly finished PhD-dissertations, previous master thesis and the scientific colloquia, summarized in the following:

A partial simulation of the earth's ionosphere with a stabilized plasma as a basis of the simulation has been realized. Thanking the previously mentioned measurement equipments, a simultaneous measurement of the plasma current variations was made possible. Thus, simulations of the Birkeland, Pederson and Hall currents as well as events in the near earth space (triggered by solar events like Flares, CMEs ... etc.) can be represented. Similarly it is possible to investigate the properties of atmospheres of almost arbitrary types (for example of exoplanets) considering its conductivity and other parameters. With the respective slight alterations, the Ionospektroskop© is able to register complex parameters of diverse investigations.

As a conclusion of this report, an overview of a measurement procedure for a partial ionospheric simulation in the region up to 80 km height will be outlined in the following:

1. Pumping the gas mixture to be investigated to an end pressure of approximately 0,05 to 0,01 mbar.
2. The calculation and manufacturing of a container of the gas volume to be investigated, which has to be big enough so that ionization currents (electrons and ions) can evolve in 3 directions depending on the applied fields.
3. Normally only a single plasma filament evolves in an electrical plasma discharge which exhibits a raised current density. Therefore, a continuous breakdown impulse (frequency between 3 and 5 kHz) must exist through a break spark contact, which assures the generation of stabilized plasma (similar as in the ionosphere).

Figure 8: High voltage generation
4. The evacuated tube is provided with two rows of 7 electrode pairs fronting each other on its upper and lower sides. In these electrodes different signals can be fed to influence the plasma.

5. All evolving currents and fields in the x-y-z directions can be simultaneously measured in the picoseconds-range by the Helmholtz coils.

![Figure 9: LeCroy LC534 used for monitoring the high voltage generator (Heinzinger)](image)

6. Plasma fields and currents behaviors can be repeatedly altered by feeding predefined currents in the Helmholtz coils.

7. Currents directions, densities and its variations can be detected from the μV range up to kV by modified Rogowski coils and high voltage probes.

![Figure 10: Microwave generation and detection](image)

8. Using the mathematical operations provided directly by the measurement equipment (without adaptation problems!!!), different signal analysis procedure can be carried out such as the
Fourier analysis, weighted averaging along other analytical functions. This presents an enormous time saving by the results analysis especially for inexperienced measurement engineers.

9. A direct read-out with USB-sticks or external hard disks enables the quick integration in reports as well as a reliable coupling with other computer programs.

10. A cross-linkage of the measurement devices (for example using 3 oscilloscopes with 4 input channels each) can enable a real concurrent monitoring of 12 parameters. The interconnection can be additionally connected to an external atomic clock for synchronization purposes.

![Figure 11: The Microwave System](image)

These measurements were conducted additionally with LeCroy SDA 820Zi-A and had shown important physical coherences of plasma discharges, which have not been revealed yet as far our knowledge goes.

![Figure 12: the optical system](image)

The existence verification of Ozon in the plasma chamber was successfully achieved by a wideband spectrometer in the range 200 nm to 1200 nm.
Gender Dimensions of Street Children in Ibadan, Nigeria

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Abstract
While the dramatic proliferation and plight of street children in Nigerian urban centres have attracted considerable research attention, the gender dimension of this social phenomenon remained understudied. This study therefore analyses the gender dimension of street children in Ibadan. It first enumerated street children in the three residential neighbourhoods (urban high, medium and low density areas) in Ibadan and then selected 10% of observed figure for purpose of questionnaire administration to obtain information on their socio-cultural and socio-economic characteristics. Relative Incidence of Street Children (RISC) was computed and used to analyse gender and spatial variations of street children, using cross tabulation. Results reveal among others, that there were more boys (69.1%) than girls (30.9%) on the street of Ibadan. Similar pattern was observed when disaggregated by residential densities and land uses except in markets where there were more girls (53.68%) than boys (46.32%). The observed gender disparity in school attendance was in favour of street boys (63.7%). Similarly more boys (90%) than girls (10%) had stayed for more than one year on the street. As a means to ensure effective policy programme, the study suggests the need to address gender dimension in any intervention strategy or policy for street children.

Keywords: Gender, Street Children, Poverty, Land use Pattern
Introduction

Nigerian cities are faced with multifaceted problems among which the social aspects are most pronounced (Obioha, 2009). “Street children” is a social menace and it is observed to result majorly from poverty (Okpukpara, 2006; Falloore, 2009), though other socio cultural and environmental factors may have catalytic effect. Nigeria has experienced a high incidence of poverty in the last two decades. For instance, an estimate from World Bank (2000) indicates that over 45% of the country’s population live below poverty level while about two third of this group are extremely poor. This estimate has also been confirmed with the fact that about 68.7 million Nigerians are poor (Punch, March 30, 2005). This has direct bearing on the children and it is particularly noteworthy in the way most children are deprived of nutrition, potable water, sanitation facilities, access to basic health care services, shelter, and education. To worsen the situation, the social and political accountability of Nigerian societies to these children is non-existent and to a large extent not challenged either by internal or external elements. Therefore in order to cope with the appalling situation, children take to the street in search of opportunities.

Street children come in diverse forms and are manifested as vendors or hawkers, beggars, shoe-shiners, car washers and watchers, head-loaders, scavengers and bus conductors. However, one distinct manifestation of this social malaise is the “Almajiri” system in Northern Nigeria. This is the system of Islamic education that has grown to become a social problem in the country today. Young boys bearing bowls are seen in most towns and cities in northern Nigeria, begging in order to survive or as an adventure. Many of them live in unhealthy environment, thereby vulnerable to various diseases. A few of such are found in Southern cities, although in different forms, usually as a guide leading the physically handicapped adults to beg on the streets. In Eastern Nigeria, children as young as eight or nine are on the street early to trade as less premium is placed on education in this part of the country as compared to trading activities (Fakoya, 2009).

There is no gainsaying in the fact that the problem of street children in Nigeria has attracted the research attention of scholars (Okpukpara, et al, 2006; Falloore, 2009, Fakoya, 2009; Obioha, 2009; Ogunkan. 2013) as well as attracted a great deal of attention in the media and public debate. However, the gender dimension of the problem remained under-researched. An objective study of children living and working on the streets requires an investigation of not only the causative and remedial factors, but also of the gender dynamics in the streets. (WERK, 2009) it is argued here that, the impact of living and working on the street will be significantly different for the female and the male child on the street, more so that, the former are not only more vulnerable than the latter, but that the impact and implications of streetism are more far reaching for the female gender. Furthermore, an understanding of the manner and extent to which girls and boys work and are living on the street is of practical importance as it has implications for methods of intervention. However, a cursory look at the existing literature reveals that despite this acknowledgement over the last decade or so, much of the available research on street children are not gender sensitive (Faloore, 2009, Fakoya, 2009; Okpukpara, 2006) among others. This is the goal of this research.

Conceptual and Theoretical Issues

Like any other social issue, there is a great deal of fluidity in the use of the term street children, the different conceptualization reflecting varying socio cultural context and professional perspectives. Perhaps, demonstrating the claim by CSC (2009), that the term is increasingly recognized by sociologists and anthropologists to be a socially constructed category that in reality does not form a clearly defined, homogenous population or phenomenon. Therefore, particular circumstance in a particular society dictates who should be included in the definition (Owoaje et al, 2009). Hence, terms like latchkey child, vagrant, abandoned, waif, urchin etc. are synonymously used in different societies and at different circumstances to denote street children (Veale, 1992).
Nevertheless, Veale (1992) conceptualized street children from two stand points: popular and legal meaning of street children. According to him, the popular meaning of street children sees them in the context of the particular society in which they evolved whereas the legal conceptualization is historical in the criminalization of vagrancy in England. Vagrancy law in England has its root in societal perception of vagrants in the mid-nineteenth century and children were not exempted from such portrayal and as of today, were perceived as a social threat (Veale, 1992). The broad definition provided by Inter-NGO (1995) seems to enjoy popular support of practitioners, scholars and policy makers. According to the body, the term street children refers to any girl or boy who has not reached adulthood, for whom the street (in the broadest sense of the word, including unoccupied dwellings, wasteland etc.) has become her or his habitual abode and/or sources of livelihood, and who is inadequately protected, supervised or directed by responsible adults. Following from this broad definition, UNICEF (2004) distinguishes between “children of the street” and “children on the street”. Children of the street are homeless children who live and sleep on the street in an urban area. For those children, family ties may exist, but they are tenuous and maintained occasionally (Halloy and Huser, 2005). On the other hand, children on the street earn their living or beg for money on the street and return to their homes at night. They are likely to hand over all or parts of their earnings to the family. They may be attending school and retain a sense of belonging to the family. Because of the economic fragility of the family, these children may eventually opt for a permanent life on the street (Wikipedia, 2012).

The concept of gender is a socio-cultural variable which is established in different socio-cultural contexts. The prevailing socio-cultural elements determine what is expected, allowed and valued in a woman/ man and girl/boy in different socio-cultural settings. The term sex and gender have often been used interchangeably; however a distinction was made between the two terms in the 1950s and 1960s by British and American psychiatrists and other medical personnel working with intersexual and transsexual patients (Moi, 2005). It follows therefore, that the term gender has been increasingly used to distinguish between sex as a biological concept and gender as socially and culturally constructed. Sex as a biological concept is fixed and based in nature while gender as a social concept is fluid and based in culture (Goldsten, 2003). From this perspective gender refers to economic, social and cultural attributes and opportunities associated with being male or female at a particular point in time (WHO, 2001) while sex refers to the biological characteristics that defines human as female or male (WHO, 2002)

Bornstein (1998) while solving the gender puzzle presents a variety of definitions of gender as (i) a fanatical cult, demanding blind obedience to mostly unwritten, un-agreed upon rules, regulations and qualifications; (ii) any standard (usually but not necessarily biological) by which we can easily and without much thought conveniently divide human race into two neat parcels (e.g sociological, genital, chromosomal, psychological, hormonal etc) (iii) an oppressive class system of two and only two classes, usually held in place by assumption that the class system is “natural” in which system one class has nearly total economic and political power over the other.(iv) a means of cultural traction, an identity or persona by which to identify oneself to another or maintain some position within a relationship or culture. (v) currently a system of dividing people into one or two impossible to-live-up-to standard; male or female (vi) a means by which we can express our sexual desires and (vii) a means by which we can attract others, to whom we are attracted.

Irrespective of the dimension by which the concept of gender is conceived, it is central to how societies assign roles, responsibilities, resources, and rights between women and men. Allocation, distribution, utilization, and control of resources are thus incumbent upon gender relations embedded in both ideology and practice. Gender analyses do not merely focus on women, but also look at the ways in which men and women interact with each other and the gendered nature
of their roles, relations, and control over resources. Therefore any gender sensitive study should concern and engage men as well as women.

Social scientists explain gender roles according to several theoretical perspectives - general ways of understanding social reality that guide the research process and provide a means for interpreting the data. In the process many theoretical arguments have been put forward to describe, explain and trace the origin and implications of differences in the behaviour and experiences of men/women and boys/girls. From the functionalist perspective, gender differences between men and women are immutable, and therefore universal. The immutability is traced back to biology and the social institutional needs for men and women to fill different roles, especially but not exclusively in the family (Tischler 2006). Functionalisitc argue that men and women are socially assigned different roles and expectations. This, they argue, minimized disruption and maximizes harmony within the family and society at large (Parsons, 1966; Parsons and Bales, 1955)

The structural oppression theories (e.g. Marxist, Socialist feminism, Third World feminism, Black feminism) are an antipodal of functionalist explanation of gender roles. The structural oppression theorists contend those women’s experiences of differences, inequality and oppression varies by their social location within capitalism, patriarchy, class, nationality, race and ethnicity etc. (Ritzer and Goodmen 2003). The combined views from the structural oppression theorists, underpin the notion that women are not a homogenous group and therefore analysis of women’s condition should not be reduced to gender relations only, even though these have a powerful effect on their development as social subjects.

The symbolic interactionists use the term “Doing Gender” to explain the origin and existence of the concept “gender”. Symbolic interactionists contend that the concept “gender” does not exist objectively but emerge through a socially constructed process. People called “females” or “males” are endowed with certain traits defined as feminine or masculine. Therefore the concept “gender” must be found in the meanings people attached to it (Denzin, 1993; Deutscher and Lindsey, 2005). Gender emerges not as an individual attribute but something that is “accomplished” in interaction with others. People, therefore, are doing gender (Fenstermaker and West, 2002). In “doing” gender, symbolic interaction takes its lead from Erving Goffman (1922–1982), who developed a dramaturgy approach to social interaction. It has been argued that the best way to understand social interaction is to consider it as an enactment in a theatrical performance. Like actors on a stage, we use strategies of impression management, providing information and cues to others that present us in a favorable light (Goffman, 1959, 1963, 1971)

Having examined the variant of theories underlying the concept of gender, the question that comes to mind is how do children internalize the gender roles? This can be explained using social constructionist approach as espoused by Coltrane (1998) which views gender acquisition as a self-fulfilling prophecy.

“Children learn about gender and how to “do gender” because it is central to the way we organize society. Children learn culturally appropriate ways of thinking and being as they follow routine rituals and respond to the everyday demands of the world in which they live... To be considered competent members of society, they must learn how to fit in as appropriately gendered individuals.” (Coltrane, p. 114)

According to social construction theory, society treats boys and girls differently, and gives them different opportunities for development. This differential treatment promotes certain behaviors and self-images that recreate the preconceived cultural stereotypes about gender. (Coltrane.) This ultimately has bearing on the socialization process of the children. Therefore, gender socialization turns children into “cultural natives,” who know their culture’s reality without realizing that other realities are possible.
Methodology

The study setting is Ibadan metropolis which consists of Ibadan North, Ibadan North East, Ibadan South East and Ibadan West local governments. Ibadan is a pre-colonial urban centre with vast spatial extent and well distinguishable residential neighbourhoods; urban high, medium and low residential densities. Ibadan is a town in highly urbanized South–Western Nigeria which urbanization predates colonial influence in the country. The city of Ibadan has recorded substantial growth primary owning to its central location in Yorubaland as well as its accessibility from colonial capital city of Lagos (Udo, 1994). In addition to rural-urban migration, urbanization in Ibadan is also due to immigration form other urban centres as well as from other ethnic groups from within and outside Nigeria (Afolayan, 1994).

For this study, we required two categories of data. These are: (1) incidence of street children and (2) socio-economic and other characteristics of street children. The first category was obtained through street children enumeration at selected major land use areas across the three residential zones of urban high; medium and low residential zones, (see table 1). The counting was done on four different days of the week i.e. Friday, Saturday, Sunday and Wednesday. Relative Incidence of Street Children was computed (RISC) by dividing the total number of street children obtained in four days by four. The second category of data was collected by conducting face to face interview with 10 percent of RISC by using pre-designed questionnaire. Data was compiled and analysed using cross tabulations to show the gender and spatial variations of street children.

| Table 1: Selected Locations (Data Delineated Areas) |
|-----------------------------------------------|-----------|---------|----------|-----------|-------------------------------------------------------------------|
| Residential District | Mosques | Churches | Markets | Junctions | Motor parks |
| HIGH | Oja Oba Central Mosque | Oke Padi Catholic Church | Gbagi- Dugbe Market | Dugbe junction | Gbagi – Ogunpa-Dugbe Motor Park |
| MEDIUM | Alhaji Arisekola Mosque | Orita Mefa Baptist Church | Agodi – Gate Market | Iwo Road Round about | Iwo Road Motor park |
| LOW | Bodija Community Mosque | Living Spring Church | Bodija Market Sango/ polytechnics junction | Sango Motor Park |

Source: Author’s field work

Results and Discussion

Gender and Incidence of Street Children

The gender of street children varies from place to place, but WHO (1995) puts the proportion of girls among street children to be less than 30% in developing countries. A similar finding was reported from the Lusaka study which puts the proportion of girls at 20% (PCIZ, 2002). These findings were corroborated in this study as the bulk of street children identified were street boys (69.1%) compared with the proportion of street girls (30.9%) as reflected in figure 1.
Figure 1: Gender of Street Children

When disaggregated by residential density, the proportions for the gender of street children are observed to be similar across residential neighbourhoods. As depicted in Figure 2, high density residential neighbourhoods have almost two thirds (72.73%) of the identified street children as boys while girls constituted the remaining 27.27%. The incidence as observed in medium density was not different from the observation in high density as the observed proportion of male street children was almost three times (74.57%) as high as number of female street children (25.43%). This pattern was also reflected even in low density where significant proportion (61.02%) of street children were boys.

The gender ratio as observed from this analysis conforms to the worldwide trend of relatively fewer street girls than street boys. Espinola, et al (1987) reported that 90% of the young street workers engaged in vending or service occupations in Asuncián were boys. Felsman’s (1981) sample of 120 Colombian gamins and Aptekar’s (1988) sample of Colombian street children comprised solely males. In Ethiopia, street boys and girls constitute, respectively, an estimated 75% and 25% proportion of the street child population (UNICEF, 1993).

Figure 2: Gender by Residential Neighbourhood

Source: Author’s field work, 2012
The reasons for this may not be farfetched. Connolly (1990) reports that in Latin America “girls are more needed within the family, as they are expected to perform household chores and care for younger siblings”. It is reasonable to speculate that girls are prevented from working on the streets for similar reason in Nigeria. Veale (1993) reported that generally, parents were concerned and worried about the dangers associated with working on the street. Therefore, they are not willing to allow their female children to go on streets. One cannot rule out this possibility in Nigeria.

It is also important to note that the true incidence of street girls may be hidden by the clandestine nature of their work, which tends to be less visible than the work that street boys engage in. For example, females may work as maids in bars, back street hotels and private houses. (Lalor, 1999) or may be engaged as child prostitutes (Ogunkan et al, 2011) while street boys engage in visible activities as bus conducting, street trading, scavenging and even street urchins. The wide gap in gender composition of street children may also not be unconnected with the cultural belief that regards male as breadwinner of the family. In recognition of this cultural value, female children are compelled to stay at home while the male go to the street in search of opportunities.

**Reasons for Streetism**

In a bid to address the issue of street children, it is essential to know why children are on the street. In this wise, street children were asked why they were on street. In response to this question, a range of factors was given by the children and a perusal of these factors shows that most children in the street were pushed to the street due to circumstances beyond their control.

As illustrated in figure 3, out of 138 that responded to this question, more than two third (35.6%) were on the street because of lack financial support as they reported being on the street to obtain money for personal maintenance or upkeep. More than one quarter (28.9%) were out to earn income for family as they were actually sent on the street by their parents. Over one tenth (15.8%) see the street as avenue to meet friends (evidence of peer influence). Almost 10% ran to seek refuge on the street from abusive parents or care – givers. Others become street children because of death of parents (6.5%) and hunger (3.9%).

**Figure 3: Reasons for being on the street**

![Figure 3: Reasons for being on the street](image)

**Source: Author’s field work, 2012**

It is clear from figure 3 that economic reason or poverty (either to get money or sent by parents for this purpose) is the overriding reason why children are on the streets. If the category “To get money” is added to “Sent by parents” they collectively account for nearly two third (64.5%) of
the total. There is little doubt that the overall socio-economic situation is exacerbated by individual vulnerabilities resulting in children having to earn money to supplement personal and household income.

**Land use and Gender Dimension of street children**

Previous studies on street children (WERK, 2002, Falloore, 2009, Fakoya, 2009) have emphasized the fact that street children are found at motor parks, markets, road junctions, religious centres (mosque and church areas), among other public places. However, analysis of variations in gender of street children by land use pattern reveals hitherto hidden dimension of this social phenomenon. The findings as summarized by Figure 4 shows that over two third (71.7%) of the street children identified in Mosques were males while the proportion of their female counterparts were about 29%. The same pattern is observed in almost all other land uses. For instance, in Junctions, 75.77% of the identified street children were boys compared to 24.23% proportion for girls. In Motor parks, the number of street children identified included over four times as many boys as girls (83.54% vs 16.46%). The situation is almost the same around churches where an overwhelming 84.71% of the total number of the identified street children was boys. However, the reverse was the case for market where the pattern was distorted as more than half (53.68%) of the identified street children were girls while boys accounted for 46.32%. Overall, 70.62% of the identified street children were males while 29.38% were females.

**Figure 4: Gender Distribution of Street Children by Land use**

Source: Author’s field work, 2012

**Education and Gender of Street Children**

While education is clearly significant for the development of an individual and for the well being of society, it may be less obvious why education is important in the context of street children. Of all 152 street children sampled in the survey, as summarized in table 2, nearly 40.1% were found to be out of school. This figure includes 45.8% of the boys and 26.7% of the girls included in the survey. The gender proportions for school attending street children were 63.7% and 36.3% for boys and girls respectively.
Table 2: Educational Status of Street Children by Gender

<table>
<thead>
<tr>
<th>EDUCATION STATUS</th>
<th>STREET BOYS</th>
<th>STREET GIRLS</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>In school</td>
<td>58</td>
<td>54.2</td>
<td>33</td>
</tr>
<tr>
<td>Never enrolled</td>
<td>16</td>
<td>15.0</td>
<td>4</td>
</tr>
<tr>
<td>School Drop-out</td>
<td>33</td>
<td>30.8</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>107</td>
<td>100</td>
<td>45</td>
</tr>
</tbody>
</table>

Source: Author’s field work, 2012

Although significant proportion of street children were out of school, the majority (68.2%) had, at some time in the past, attended school; 31.8% had never been to school. The percentage of boys who had previously attended school was almost twice the percentage of girls (30.8% versus 17.8%).

Means of Livelihood of Street Children

<table>
<thead>
<tr>
<th>Means of Livelihood</th>
<th>Gender of Street Children</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>Commercial</td>
<td>37</td>
<td>34.6</td>
<td>35</td>
</tr>
<tr>
<td>Begging</td>
<td>20</td>
<td>18.7</td>
<td>5</td>
</tr>
<tr>
<td>Bus conducting</td>
<td>19</td>
<td>17.8</td>
<td>-</td>
</tr>
<tr>
<td>Load Carrying</td>
<td>18</td>
<td>16.8</td>
<td>2</td>
</tr>
<tr>
<td>Scavenging</td>
<td>9</td>
<td>8.4</td>
<td>1</td>
</tr>
<tr>
<td>Grabbing/ Stealing</td>
<td>4</td>
<td>3.7</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>107</td>
<td>100</td>
<td>45</td>
</tr>
</tbody>
</table>

Analysis of means of livelihood of street children shows that majority (47.2%) of street children were into commercial activities such as hawking and trading. The means of livelihood of the bulk of the (16.7%) was begging, 12.7%, 13.5% and 6.5% of street children survived as bus conductors, load carriers and scavengers respectively. Others (3.4%) could not ascertain their means of income and are therefore suspected to live on grabbing or stealing on the street.

Table 3: Means of Livelihood of Street children by Gender

Source: Authors’ field work, 2012

A disaggregation of data by gender (Table 3) reveals that the proportion of girls engaging in commercial activities is more than twice the number of boys in the same activities. (77.8% girls versus 34.6% boys).

Gender and Risks of Street Life

Characteristics of street life, street children are susceptible to risks when working or living on the street. More than half (57.4%) of the sampled street children reported facing violence or assault on the street. This population includes more than two third (75.9%) street boy and less than one fourth (24.1%) street girls. The types of risk faced mainly by street children are physical harassment (27.6), theft of money (15.0%), fights (24.1%) and sexual abuse or harassment (23.0%). Other forms of harassment such as insults (5.7), and hunger (4.6) were also mentioned. Physical harassment, sexual abuse, and sexual harassment were relatively more frequently reported by girls than boys. (see table 4)
Table 4: Risks of Street Children by Gender

<table>
<thead>
<tr>
<th>Risks</th>
<th>Street Boys</th>
<th></th>
<th>Street Girls</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Physical Harassment</td>
<td>17</td>
<td>25.7</td>
<td>7</td>
<td>33.3</td>
<td>24</td>
<td>27.6</td>
</tr>
<tr>
<td>Theft of money</td>
<td>11</td>
<td>16.6</td>
<td>2</td>
<td>9.5</td>
<td>13</td>
<td>15.0</td>
</tr>
<tr>
<td>Fight</td>
<td>18</td>
<td>27.3</td>
<td>3</td>
<td>14.3</td>
<td>21</td>
<td>24.1</td>
</tr>
<tr>
<td>Sexual abuse or Harassment</td>
<td>12</td>
<td>18.2</td>
<td>8</td>
<td>38.1</td>
<td>20</td>
<td>23.0</td>
</tr>
<tr>
<td>Insult</td>
<td>4</td>
<td>6.1</td>
<td>1</td>
<td>4.8</td>
<td>5</td>
<td>5.7</td>
</tr>
<tr>
<td>Hunger</td>
<td>4</td>
<td>6.1</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td>4.6</td>
</tr>
<tr>
<td>Total</td>
<td>66</td>
<td>100</td>
<td>21</td>
<td>100</td>
<td>87</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Author’s field work, 2012

Length of Time Spent on the Street

Information on the length of stay of street children becomes necessary so as to know the kind of intervention suitable for them. Over half (57.2%) have been spending time on the street for the past two years. Slightly over two fifth (40.2%) have been on the street for 3 years and longer while 2.6% have been street children for over ten years.

Table 5: Length of Time on the street by Categories of Street children

<table>
<thead>
<tr>
<th>Length of time</th>
<th>Gender of Street Children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Street Boys</td>
</tr>
<tr>
<td>Less than 6 months</td>
<td>16</td>
</tr>
<tr>
<td>6 months – 1 year</td>
<td>18</td>
</tr>
<tr>
<td>1 – 2 years</td>
<td>36</td>
</tr>
<tr>
<td>3 – 5</td>
<td>16</td>
</tr>
<tr>
<td>6 – 10</td>
<td>11</td>
</tr>
<tr>
<td>10 years +</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>107</td>
</tr>
</tbody>
</table>

Source: Author’s field work, 2012

As indicated in Table 5, street boys tended to have stayed longer on the streets than their female counterpart. More than 90% of street boys have spent more than one year on the street compared to less than three quarter of street girls who have spent similar years on the street. Almost one tenth (9.4%) of street boys have spent more than ten years on the street while less than three percent of street girls have been on the street more than ten years. It is observed that street girls disappear as they grow older while they are represented in high numbers at infancy stage.

POLICY IMPLICATION

One major observation in this study is that, it would be very difficult for any policy on street children to be effective without first making education free and compulsory. Policy makers in most countries believe that mandatory education is a prerequisite for the eventual abolition of all forms of child labour (Weiner, 1990). In view of the foregoing, government should introduce policy measures to ensure that education is not only free but also compulsory from primary to secondary school. More pragmatic measure should be put in place to ensure that it is a crime for a school age child to be on the street, with the erring child and the parents being made culpable. This will assist to keep children off the street. The introduction of the Universal Basic Education represents a positive step in this direction. However, the effect of over politization and corruption bedeviling programme should
be addressed. In addition to this, government should improve the infrastructural facilities and services in primary and secondary schools in the country and make it attractive. If education is truly going to be an effective strategy for keeping the young children of both genders out of the streets, then the pedagogy will have to be transformative and learner-centred. This will ensure the compliance with policy recommendations for solving educational issues of street children in Nigeria in line with the context of the Millennium Development Goals (MDG 2: Achieving Universal Education) and Education for All strategies that the country has signed.

As could be seen from the spatio-gender analysis in this study, the menace of street children has land use implication. Against this background, there is an urgent need for physical planning policy that will ensure harmonious development and a functional efficiency of land uses and to meet the needs of users of urban facilities. This policy should be geared towards good design and efficient and effective land use management that will guide against the springing up of indiscriminate location of squatter informal sector activities which street children usually mingle with.

Poverty has been observed as the overriding reason why children are on the street. Therefore, the overall problem of poverty which is endemic in Nigerian society must be dealt with. Finding effective poverty reduction measure is crucial for preventing and solving the problem of streetism. In an attempt to address the problem of poverty in Nigeria, government has embarked on series of poverty alleviation programmes. However, these programmes are far from reaching certain categories of the poor with whom poverty may be observed to be acute. Therefore, for the poor to come out of this vicious cycle in which they are presently enmeshed, new poverty reduction strategies should be formulated and the existing ones strengthened and be centred on the “basic needs” approach to address the needs of children.

Although street children share some generic characteristics, the differences between street boys and street girls on the street of Ibadan are considerably apparent. While some studies justifiably focus on street boys due to their overrepresentation of the working population, the plight of street and working girls should not be neglected. This study shows that in addition to gender disparity in the incidence of street children, there are also considerable differences in the activities, education status, length of stay on the street and risks of street life between street boys and girls. This suggests that the impact of living and working on the street will be significantly different for female and male children on the street. In view of this, it is suggested here that there is the need to address gender dimension in any intervention strategies for street children and as such, it becomes incumbent upon the governments, support providers and other stakeholders to embark upon gender sensitive programmes to ameliorate the problem of street children. Such programs need to consider: (a) the type of activities in which boys and girls are engaged; (b) the risks and hazards boys and girls face (physical and psychological), either through the activities or working and living on the street; (c) the length of stay on the street of street boys and girls. This will ensure that these programmes are sensitive to gender equality and rights of the child as propagated by international human rights instruments such as the Convention on the Rights of the Child (CRC) and the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW).

**Conclusion**

From the evidences presented in this study, it is apparent that the problem of street children cannot be addressed within a universal program approach. Therefore policy makers should adopt tailor made multi-faceted, multi-tiered and multi targeted approaches, if they must make impact at all in the lives of street children. However, while holistic and wide ranged approaches are recommended in tackling the overall problem of street children, it would be particularly useful to consider gender differences of the children in designing intervention strategies. It is also important to point out that these intervention strategies would have to differ in terms of the details of the content.
and focus based on various age categories. Finally, it must be stated that the impact of research to policy development for street children cannot be overemphasized. In recognition of this fact both qualitative and quantitative research should be regularly conducted on street children to assist policymakers in designing effective and efficient intervention strategies.

References
Inter-NGO Programme on Street Children and Street Youth (1983) “Summary of proceeding”, Sub-regional seminar for the Mediterranean, Marseilles, 24th-27th October 1983:


Ensuring continuity and credibility of research through audit trail: Guidelines and examples from case studies

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Abstract
There is lack of awareness among investigators to use audit trail as a technique to document the development of research projects and to ensure credibility and continuity of research projects. Therefore the purpose of this paper is to showcase the usage of audit trail as a strategic and congruent method to reflect the rigor and credibility of conducting research for both quantitative and qualitative research. This article explains step by step guidelines using Halpern’s modified audit trail model on two different case studies. The cases were taken from healthcare and higher education sectors. The authors hope with the provision of clear audit procedures and excerpts taken from the cases will encourage researchers to adopt audit trail as a data management strategy and evidence of research trustworthiness.

Keywords: Audit trail, research continuity, trustworthiness, quality assurance, higher education, healthcare.
Qualitative research was initiated to understand social behaviour in its natural setting through lived experiences (Woolf, 2006). The increasing prominence of qualitative research in scientific and educational communities is motivated by the emergence of new social contexts and perspectives due to global diversification. This has lead to a strong debate with quantitative researchers about issues in quality management and evidence of validity and reliability. Among the criticisms are qualitative research lacked scientific rigor and credibility associated with traditional quantitative methods (Horsburgh, 2003). This is due to the nature of qualitative research, which is carried out against an ever-changing setting (Barbour, 2001) where continuous reflection and revision of research methods and questions are encouraged (Woolf, 2006). Although there is still a strong reliance on quantitative research methods to provide statistical evidence of research credibility, it is the researcher’s responsibility to persuade the scientific community that the analysis and findings of qualitative investigations are systematic, objective, and valuable (Wolf, 2003).

Concerns were raised on whether the assessment criteria for quantitative research are relevant for qualitative research. Past researches have shown that using quantitative terms to measure the credibility of qualitative research is inappropriate (Morse, Barrett, Mayan, Olson, & Spiers, 2002). Moreover, it is improper to import or translate quantitative terms into measures of credibility suitable for qualitative research (Cutcliffe & McKenna, 2004). There is also difficulty in establishing a consensus on quality criteria since there is no cohesive body of theory or methodology that can describe qualitative research altogether (Rolfe, 2006). Despite this, it is important for qualitative research to have a quality procedure so that it will enable researchers to put forward thorough qualitative studies with stronger or equal value to quantitative studies (Akkerman, Admiraal, Brekelmans & Oost, 2008). There is a debate that qualitative researchers should focus on research rigor which includes the planning and implementation of research rather than the validity and reliability of research (Twycross & Shields, 2005). Rigor also stresses on whether qualitative research is conducted in a logical and systematic manner. Nonetheless, it is important for researchers to know about the quality criteria and management methods for qualitative research. Flynn, Schroeder, and Sakakibara (1994) viewed quality management as a philosophy that emphasizes on the maintenance and continuous improvement of strategies to meet or exceed the standards set by an organizational body or stakeholders. Despite the apparent need for quality management procedures, it is difficult to find appropriate validation techniques within the literature databases (Akkerman, et al., 2008). There is a necessity to look at measures of accuracy and trustworthiness from different perspectives to ensure the worthiness be it qualitative or quantitative findings.

Trustworthiness as quality criteria for qualitative research

Guba (1981) identified four aspects of trustworthiness that is appropriate for qualitative research: (a) truth value, (b) applicability, (c) consistency, and (d) neutrality. Truth value is similar to internal validity. In qualitative research, truth value is ascertained from insight of lived experiences as perceived by research participants. Truth value can be described as credibility (Lincoln & Guba, 1985) and should provide precise interpretations of lived experiences that others who share that experience would immediately identify the similarities. If differences are observed, it should clearly show how each theme was derived from the descriptions. The researcher needs to return to the original text to ensure that all conclusions are explained in the researcher’s interpretive scheme (Koch, 1994).

The second aspect of applicability is similar to external validity, which is the transferability of research findings to other contexts. There are disputes that this criterion may be irrelevant since qualitative research is conducted in naturalistic settings with less control over research variables. However, Lincoln and Guba (1985) argued that applicability is addressed if the researcher is able to provide ample descriptive data for comparison.
The third aspect, which is consistency of findings in qualitative research, is explained through the concept of dependability. In qualitative research, variability and the uniqueness in participants’ experience is emphasized. Thus, a research is consistent if the sources of variability are traceable and have the ability to provide insight, even if the experiences are not representative of the group population (Guba, 1981). The last aspect is neutrality, which refers to research objectivity. Generally, objectivity involves putting distance between the researcher and participant to reduce research bias. Nevertheless, qualitative researchers tend to increase the value of their findings by prolonging contact with participants during interview or observation sessions to achieve a better understanding of participants’ experiences. Thus, the emphasis in neutrality should be focused towards the data rather than the researcher (Lincoln & Guba, 1985). Confirmability was proposed as the standard of neutrality and is achieved when truth, credibility and transferability is established (Lincoln & Guba, 1985).

A comparison of the terms used to describe the four aspects of trustworthiness in conventional research paradigms which are quantitative in nature versus naturalist research paradigms which are qualitative in nature are summarized in Table 1.

<table>
<thead>
<tr>
<th>Aspects of trustworthiness</th>
<th>Conventional paradigm</th>
<th>Naturalist paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truth value</td>
<td>Internal validity</td>
<td>Credibility</td>
</tr>
<tr>
<td>Applicability</td>
<td>External validity</td>
<td>Transferability</td>
</tr>
<tr>
<td>Consistency</td>
<td>Reliability</td>
<td>Dependability</td>
</tr>
<tr>
<td>Neutrality</td>
<td>Objectivity</td>
<td>Confirmability</td>
</tr>
</tbody>
</table>

Note: Adapted from Koch (1994) and Lincoln and Guba (1985)

A wide range of strategies can be used to increase research trustworthiness such as triangulation, reflexivity (field journal), confirmability or dependability audit, and peer examination (Krefting, 1991). This article will focus on one of the strategies by using audit trail as a method to document research data, memos, reflective notes and other documents which contribute towards trustworthiness of qualitative or quantitative research.

Definition and concept of audit trail

Qualitative research involves intensive data gathering, information coding, development of manageable data units for analysis and the formation of themes for interpretations. Due to the complexity of the research process, an audit trail is necessary to document the process of gathering data for analysis (Akkerman, et al., 2008). The audit trail demonstrates the dependability of a qualitative research (Koch, 1994) and establishes research confirmability (Lincoln & Guba, 1985). Although audit trail is more commonly associated with qualitative research, it can also be applied to quantitative research. The audit trail logs the process of handling data (Richards, 2005). By logging each step, the data explains how the researcher arrives to a decision and conclusion. The researcher will be able to find the association, grouping and patterns within the data that could justify claims of research consistency and trustworthiness (Richards, 2005). Researchers can choose to conduct audit trails which are intellectual or physical in nature. An intellectual audit trail helps the researcher reflect on the evolution of thoughts throughout the study while a physical audit trail traces the research study from the identification of the research problem, the development of new theories and reflection on research methodology decisions (Carcary, 2009).

The researcher has the responsibility to create a complete, organized and easily understandable audit trail that assists future researchers trace textual data to its interpretations and vice versa (Wolf, 2003). However, Rolfe (2006) argued that the quality of research cannot be assured by the rigorous application of set procedures. Instead quality judgements require future researchers to have a subjective view of the research when appraising the quality of research. There are also
questions of what should be included as part of audit trail documentation and what are the audit procedures. Depending on the research design or framework, the information resource for qualitative or quantitative research can vary to include not only textual data but also visual and auditory data (Creswell, 2007).

Audit procedures and trail

A review of the literature in this area reveals there is limited information available for researchers on creating a comprehensive audit trail (Rodgers & Cowles, 1993; Bowen, 2009). In circumstances where there are bits of information, it is often baffling for the researcher. Out of all the models reviewed, Halpern’s (Halpern, 1983) work was deemed the most useful because it specifies categories of items that should be included in an audit trail. Halpern (1983) initially categorized the audit procedure into seven stages to describe how research trustworthiness is examined. However, these stages are inclusive of all forms of inquiry and information available. Thus, the researcher may need to have extensive experience in qualitative research to utilize Halpern’s model (Rodgers & Cowles, 1993).

Halpern (1983) later refined the seven audit stages into an audit trail classification of six categories with in-depth examples of file types and evidence collated in each stage. The six categories are (a) raw data, (b) data reduction and analysis, (c) data reconstruction and synthesis, (d) process notes, (e) intentions and disposition and (f) instrument development. This procedure was adopted by Lincoln and Guba (1985), although they advised caution in use as not all six categories are relevant for a study. Therefore, Akkerman, et al. (2008) created an audit trail procedure based on Halpern’s (Halpern, 1983) work but changed the order of the components into the chronological order of the research process. The five components are: (a) start document – conceptual framework, the methods and expected results, reflections on the researcher position; (b) final document – thesis, research report, journal article, conference proceeding; (c) raw data – field notes, raw data such as taped conversations and photographs; (d) processed data – memos, coded records, summaries, annotated records, statistical results; and (e) process document – systematic reports on data gathering and analysis, the actions taken and the associated outcomes.

In addition to producing a complete research trail, researchers are required to explain the rationale underpinning research decisions and carry out ongoing self-critique and self-appraisals. A detailed reflexive research diary is essential to accompany the research report for a proper assessment of research quality. Even though the process of documenting an audit trail is challenging and may pose a threat to participants’ confidentiality, it is important to justify credibility and make the research materials available for continuity of the research project (Horsburgh, 2003; Johnson & Waterfield, 2004) as long as the researcher follows a clear guideline and methodology.

The Study

The main aim of this research was to showcase the documentation process, usage and development of audit trail in two examples of research projects. The first research is a mixed methods study in the higher education sector while the other is a qualitative research in a healthcare setting. The first research looked into peer review of teaching (PRT), which was conducted in Monash University Malaysia. It involved the development and trialling of a peer review instrument as a strategy to improve and maintain teaching and learning quality across all disciplines. The second research involved interviewing patients and healthcare practitioners in two Malaysian healthcare facilities (HCF) to gather feedback about the healthcare practices and services provided in the hospitals. In addition, snippets of research data that demonstrate how the audit trail classifications influenced the research process and outcomes were highlighted.
Development and Procedure

The first step in developing an audit trail is data management. Data management is very important for qualitative researchers because data management and data analysis are firmly related to each other. Managing huge amounts of data is essential as part of the process to help researchers make sense of qualitative information with ease (Miles & Huberman, 1994). The data for both the healthcare and higher education case studies were organized into file folders, index cards and computer files. The files were then converted into text units for analysis using the computer analysis software, NVivo 8.

The design for the audit trail procedure in both case studies was based on the six categories suggested by Halpern (1983). However, modifications were made to the procedure so that it matches the chronological order of the research from the initiation of the study until the reporting of research outcomes as proposed by Akkerman, et al. (2008). Thus, the order of the modified audit trail was as follows:

1. Intentions and disposition
2. Instrument development
3. Process notes
4. Raw data
5. Data reduction and analysis
6. Data reconstruction and synthesis

The justification for the shift in order was that an explanation of the intentions and disposition early on will provide future researchers with an understanding of the study from the theoretical and methodological perspective (Akkerman, et al., 2008). The audit trail was categorized according to the classification. The date of each action taken and its venue were recorded where relevant. In addition, the references or codes generated were included with the folder index for documentations which were properly filed and kept for easy retrieval.

Results

The audit trail for the design and development of peer review of teaching (PRT) instrument (Case Study 1) is shown in Table 2 while the audit trail for the healthcare facilities (HCF) project in public hospitals in Malaysia (Case Study 2) is shown in Table 3. An analysis of the two case studies by classification is as follows:

Table 2: Audit trail for peer review of teaching research in Monash University Malaysia

<table>
<thead>
<tr>
<th>Classification</th>
<th>File types</th>
<th>Venue</th>
<th>Dates</th>
<th>References/Coding</th>
<th>Folder Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intentions and disposition</td>
<td>Research proposal, budget and supporting documents for research grant</td>
<td>PVC (L&amp;T) Office</td>
<td>Jan 2010</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Documents/letters seeking approval</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Approval from Head of School (JCSMHS)</td>
<td>JCSMHS Engineering</td>
<td>19 May 2010</td>
<td>3.2</td>
<td></td>
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<tr>
<td></td>
<td>Approval from Head of School (Engineering)</td>
<td>JCSMHS Business IT</td>
<td>13 Sept 2010</td>
<td></td>
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<tr>
<td></td>
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<td>JCSMHS Business IT</td>
<td>13 Sept 2010</td>
<td></td>
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<tr>
<td></td>
<td>Approval from Head of School (IT)</td>
<td>JCSMHS Business IT</td>
<td>9 Sept 2010</td>
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<tr>
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<td>9 Sept 2010</td>
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<td></td>
</tr>
<tr>
<td>Ethics approval</td>
<td>MUHREC Approval received October 2010</td>
<td>CF10/2628 - 201000146 5</td>
<td>3.1 &amp; 3.3</td>
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<tr>
<td>Instrument development</td>
<td>Design of peer review tools</td>
<td></td>
<td>6.1</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Design of peer review questionnaire</td>
<td></td>
<td>6.2</td>
<td></td>
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<td></td>
<td>Consent form and explanatory statement</td>
<td></td>
<td>6.3</td>
<td></td>
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<tr>
<td></td>
<td>Final peer review instrument</td>
<td></td>
<td>7.7</td>
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<td>Training program – “Becoming an effective peer reviewer”</td>
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<td>Process notes</td>
<td>List of Steering Committee members</td>
<td></td>
<td>2.1</td>
<td></td>
<td></td>
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<td></td>
<td>Meetings</td>
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<td>2.2</td>
<td></td>
<td></td>
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<tr>
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<td>1st Peer Review Project Meeting</td>
<td>11 Feb 2010</td>
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<td></td>
<td>Meeting with Education Committee, School of Business</td>
<td>13 Apr 2010</td>
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<td></td>
<td>2nd Peer Review Project Meeting</td>
<td>7 Sept 2010</td>
<td>7.3 &amp; 7.5</td>
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<td></td>
<td>Meeting with Head of School of Business</td>
<td>8 Sept 2010</td>
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<tr>
<td></td>
<td>Meeting with Head of School, Jeffrey Cheah School of Medicine and Health Sciences.</td>
<td>8 Sept 2010</td>
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<tr>
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<td>Briefing sessions</td>
<td>9 &amp; 11 Aug 2010;</td>
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<tr>
<td></td>
<td>Briefing to Steering Committee and individual staff</td>
<td>13Feb–31Mar2011</td>
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<td>21 Sept 2010</td>
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<td>Briefing at Jeffrey Cheah School of Medicine and Health Sciences.</td>
<td>21 &amp; 22 Sept 2010</td>
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<td>Briefing at School of Arts and Social Sciences</td>
<td>24 Mar 2011</td>
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<td>Reports to Pro-Vice Chancellor (Learning &amp; Teaching)</td>
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<td></td>
<td>1st Quarterly report</td>
<td>July 2010</td>
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<td></td>
<td>2nd Quarterly report</td>
<td>Nov 2010</td>
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<td>3rd Quarterly report</td>
<td>May 2011</td>
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<td>Financial reports – research grant</td>
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<td>Raw data</td>
<td>Preliminary information</td>
<td>Sunway Jan 2010</td>
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<td>Focus group interview (audiotape &amp; transcript)</td>
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<td>Peer review project flowchart</td>
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<tr>
<td>Group</td>
<td>Description</td>
<td>Location</td>
<td>Dates</td>
<td>Notes</td>
<td></td>
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<tr>
<td>-------</td>
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</tr>
<tr>
<td>Group 1: Pre-teaching tool distribution</td>
<td>Peer review tools Lecture Practical and Demonstration Small Group Facilitation Peer review questionnaire Reviewee Reviewer</td>
<td>Sunway &amp; CSJB</td>
<td>Sept 2010 – April 2011</td>
<td>Refer to Table 2 Refer to Table 3</td>
<td></td>
</tr>
<tr>
<td>Group 2: Workshop at international conference (AMEA)</td>
<td>Video pro-forma Video 1 Video 2 Video 3 Discussion notes (Flipcharts) Tool feedback form Lecture Practical and Demonstration Small Group Facilitation</td>
<td>IMU</td>
<td>23 Mar 2011</td>
<td>Video 1 (1) – (12) Video 2 (1) – (12) Video 3 (1) – (12) AMEAG2 L1 – L4 AMEAG2P1 – P3 AMEAG2S2 – S4</td>
<td></td>
</tr>
<tr>
<td>Group 3: Professional opinion</td>
<td>Peer review questionnaire and peer review tool feedback form</td>
<td>Sunway &amp; CSJB</td>
<td>Feb – April 2011</td>
<td>KLG3L01-L33 KLG3S02-S34 KLG3P02-P32 JBG3P01-P13 JBG3S01-S12</td>
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</table>

7.9.1

7.9.2

7.9.3
<table>
<thead>
<tr>
<th><strong>Group 4: Campus peer review training (Sunway).</strong></th>
<th>Sunway</th>
<th>5 April 2011</th>
<th>7.9.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video pro-forma</td>
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<td></td>
<td></td>
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<tr>
<td>Video 1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Video 2</td>
<td></td>
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<td></td>
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<tr>
<td>Video 3</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Discussion notes (Flipcharts)</td>
<td></td>
<td></td>
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<tr>
<td>Tool feedback forms</td>
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<tr>
<td>Lecture</td>
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<tr>
<td>Practical &amp; Demonstration</td>
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| **Data analysis**                                 |        |             | 7.8.1 |
| Research findings (SPSS & Thematic Analysis)     |        |             |      |
| Peer review tools                                 |        |             |      |
| Peer review questionnaire                         |        |             |      |
| Post-training questionnaire                       |        |             |      |

<p>| <strong>Final reports</strong>                                 |        |             | 8.2   |
| Peer review blog. (<a href="http://intranet.monash.edu.my/med/semu/default.aspx">http://intranet.monash.edu.my/med/semu/default.aspx</a>) |        |             | 8.1   |
| Presentation slides (Seminar in Australia and Sunway) |        |             | 8.3   |
| Seminar in Australia                              |        |             |      |
| Campus briefing in Sunway                          |        |             |      |
| Oral presentation – 5th World Universities Forum  | Greece | 24 May 2011 | 8.4   |
| Poster presentation – 9th Asia Pacific Medical Education Conference Publications | Singapore | 8-10 Jan 2012| 8.5 |</p>
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<td>Orientation of the ward: meeting with Head of Departments, Sisters and visiting the wards.</td>
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### Observation notes

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### Data reduction and analysis

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### Data reconstruction and synthesis

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### Part A: Intentions and disposition

A comparison of documents classified under intentions and dispositions for both case studies revealed some similarities such as the inclusion of the research proposal, which provides the research background through literature review, explains the objectives, intended methodology and outcome, reveals sources of budgeting as well as documentations on getting approval from ethics committee and relevant organisations to conduct the study. For example, approval letters from Head of Schools and Departments were acquired to conduct Case Study 1, whereas approvals from Directors in hospitals were acquired for data collection in respective hospitals for Case Study 2. This reflected the intention and disposition of the researcher.

### Part B: Instrument development

Methodological differences were revealed in a comparison of instruments developed in both case studies. For Case Study 1, the mixed methods approach was clearly shown in the researcher’s choice to develop questionnaires with close-ended and open-ended formats. The peer review instruments designed also adopted a similar format. Alternatively, the qualitative nature of Case Study 2 was demonstrated by the development of interview questionnaires for the interview sessions.

As part of the audit trail, all initial drafts, modifications to the instrument and the final instruments were included as references. Both case studies included documentations for data collection such as consent forms and explanatory statements. A training element was evident in Case Study 1 through the inclusion of the design of a training program entitled “Becoming an effective peer reviewer”. This program was representative of efforts to build a support system for faculty...
members. The training program helped identify gaps in training needs which was obtained from the faculty feedback. Subsequently, the peer review training was provided to those who were interested at the end of the project.

In addition, the materials designed will enable future researchers to better understand the researcher’s perspective. For example, two translations of the interview questionnaires were created for Case Study 2 as the researcher decided it was necessary to interview respondents from multi-ethnic and multi-lingual background.

Part C: Process notes
The process notes detailed the researcher’s daily activities, observations and reflective thoughts during the research process. These provided insights to the researcher on how the study progressed and evolved to provide the final outcome. Documents such as journal entries or research diaries enabled the researcher to highlight events that particularly influenced the conclusions made from the research. An example for Case Study 2 was the event of attending morning briefings and reports with the consultants, specialists and trainee doctors. This enabled the researcher to observe and note the practice of reflection skills among healthcare practitioners. During the verbal reports, efforts were made to discuss the reasons for medical procedures, treatment and the decisions made. Strategies to improve screening procedures and patient outcomes as well as the importance of medical history taking on decision-making were reflected.

Slight similarities and differences between the case studies were noted. Similarities between both researches included the provision of documentations that supported briefings and meetings with Heads of Department as well as lists of various contact points made by the researcher. The difference noted for Case Study 1 showed it was necessary for the researcher to include the minutes of meeting with the project steering committee, quarterly reports and financial reports to the research grant provider. This was proof of progress and served to inform them of upcoming expectations. On the other hand, the process notes for Case Study 2 emphasized on field notes from hospital observations, interview sessions, reflective thoughts and critical incidents. This helped the researcher understand the aspects of healthcare and make associations between information obtained from multiple sources. The process notes also recorded differences in recruitment methods. For example, Case Study 1 required the researcher to conduct briefings at different faculties and required the cooperation from the School Steering Committees to encourage participation. In addition field study observations toward the participants in Case Study 2 were carried out upon receiving approval from the hospital management.

Part D: Raw data
Data collection, coding and storage are the most important part of a research study. This section details the sources of data collected at different phases of the study. Raw data was recorded properly and extensively. Codes were created for easy retrieval of data for analysis and were recorded under the column, “references/coding” in the audit trail (See Table 2 and 3). The audit trail demonstrated an extensive source of information for Case Study 1 and 2. The data for analysis in Case Study 1 was derived from focus group interviews, flowcharts, peer review instruments, questionnaires, discussion notes, feedback forms and video pro-forma. Whereas, the data in Case Study 2 was derived from evaluation forms, MBBS modules, feedback forms from Continuing Professional Development activities, observation notes, as well as audio tapes and transcripts from interviews with patients, doctors and healthcare providers.

Part E: Data reduction and analysis
The types of data analysis and how it was conducted were recorded in this section. Case Study 1 used a mixed-method approach in analysing the data. SPSS version 18 was used to run the
statistical analysis for demographic information and training needs from Peer Review Questionnaires in addition to validity testing of the peer review instrument. Both case studies recorded the qualitative data with the aid of NVivo 8. In Case Study 1, a bottom-up approach was adopted where the design and process of peer review was influenced by preliminary findings provided by staff feedback through focus group interviews and questionnaires. Subsequently, measures were taken by the researchers to provide personal briefings to faculty members from all disciplines to convince them about the importance of peer review and the adoption of the instrument. The qualitative analysis of Case Study 2 on the other hand, concluded two main themes that suggested Medical Education and Leadership in Healthcare. As a result future plans in designing health care policies and medical education curriculum can be carried out by researchers or health care implementers.

Part F: Data reconstruction and synthesis

This part of the audit trail records the results and how the data analysis leads to the study outcome. In Case Study 1, the research outcome was presented in several forms (see Table 2). Research briefings were presented in Monash University Australia and Malaysia campuses. In addition, a blog for Monash staff was created at http://intranet.monash.edu.my/EQI/Education%20Quality/Forms/AllItems.aspx?RootFolder=/EQI/Education to inform faculty members about peer review of teaching along with the resources gathered and developed for their use. Apart from that, the research outcome was presented as a poster and oral presentation at international conferences. Efforts were made to publicize the research outcomes for Case Study 1 through journal publications. In Case Study 2, the research outcomes were presented as an oral presentation at an international conference and included in the conference proceedings. Additionally, the outcomes were also published in journals.

Conclusion

Audit trail is not widely practiced among qualitative researchers probably due to the notion that one needs to be an expert to conduct audit trails. This notion is not true as any researcher practicing qualitative or quantitative research may use the audit trail procedures as evidence of research credibility; as shown in the step-by-step illustration from the two case studies discussed. The examples and guidelines provided will help promote the use of audit trail in research activities and the continuity for future research.
References


**Acknowledgements**

We would like to thank the Ministry of Health (MOH), the Monash University Human Research Ethics Committee (MUHREC) and all participants involved in the study.

**Appendix 1**

**Legend:**

**HCR: Hospital at Central Region**

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<tr>
<td>Pt1-Pt6</td>
<td>Pre-test and Pilot test</td>
<td>D11</td>
<td>Diary of events (HCR)</td>
</tr>
<tr>
<td>P1-P28</td>
<td>Patients' interview questionnaire</td>
<td>D12</td>
<td>Diary of events (HSR1)</td>
</tr>
<tr>
<td>D1-D9</td>
<td>Doctors' interview questionnaire</td>
<td>D13</td>
<td>Diary of events (HSR2)</td>
</tr>
<tr>
<td>C1</td>
<td>Critical Incident</td>
<td>R1-R3</td>
<td>Reflective Thought</td>
</tr>
<tr>
<td>01</td>
<td>Observation (HCR) – Notices</td>
<td>02</td>
<td>Observation (HCR)</td>
</tr>
<tr>
<td>03</td>
<td>Observation (HSR) – Notices</td>
<td>04</td>
<td>Observation (HSR)</td>
</tr>
</tbody>
</table>
Effects of Mathematical Modelling on Word Problem Solving and Achievement of Students in Mathematics in Jos South

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Abstract
This study used quasi-experimental research design to investigate the effectiveness of mathematical modelling on ability of students to solve word problems and their achievement in mathematics. Sample consisted of 26 SS1 students from Vwang (VSch-A) and Zawan (ZSch-B) community secondary schools in Jos South. The sample was selected using purposive sampling technique. VSch-A served as the experimental group while ZSch-B served as the control group. Data was obtained using ATPS with a reliability coefficient of 0.82. Before the experiment, the sample was pre-tested. After this, the experimental group was taught mathematical modelling with each lesson lasting 1hr 20 minutes. After the experiment, the sample was post-tested. The data collected was analyzed using descriptive and inferential statistics. The findings from the study show that mathematical modelling is effective in helping students to develop good problem solving skills and strategies better than traditional methods of teaching. Also, it resulted into significant mean difference in mathematics achievement between the experimental and control groups in favour of the former group, and male and female students from the former group gained from it without significant mean difference in their achievement. It was recommended that the method should be used in teaching mathematics; teachers should help and encourage students to use their independent solution strategies in solving problems; and they should encourage students particularly females to engage in solving problems in mathematics by way of cooperation and collaboration with their colleagues among other things.

Key words: Mathematics, Modelling, Education, Problems, Problem Solving, Achievement.
Introduction

In most countries including Nigeria, mathematics is compulsory for students in primary and secondary schools because it is important and indispensable in national development (Obodo & Onoh, 2000). It is regrettable that the performance of students in this important subject is poor and the problem is still persisting (Akintoye & Shotuyi, 2005). Suggestions have been offered to mitigate it but it is difficult to say whether such suggestions will bring lasting solution because of its prolonged effect, which is further aggravated by current challenges in the society such as insecurity, strikes and shortage of teachers. For example, the chief examiner for the West African Examinations Council (WAEC, 2002; WAEC, 2003) suggested that urgent steps should be taken to solve the problem including the use of practical approaches and revision of past examination questions with students, but teachers are not sufficient in number to implement these suggestions. Blantan (1991) suggested that the factors responsible for the poor performance should be addressed. These include lack of interest, large class size, indiscipline, difficulty of mathematics and the belief people have that the subject is not for everyone. Unfortunately, insecurity problems and the dearth of teachers and so on tend to aggravate the magnitude of these problems.

Nevertheless, the problem can be reduced using learner-centred and friendly methods (Alío, 2000) and basic principles of teaching which makes learning interesting (WAEC, 2002). Also, it can be reduced if teachers provide opportunity for students to use their skills (Azuka, 2003) instead of following rules in solving mathematics problems.

Teaching students to develop and apply their skills in solving problems in mathematics is very important because it helps in developing their creative and computational skills. Also, it fosters their logical thinking, spatial manipulation and general quantitative reasoning (Wu, Griffin, Dulhunty & Mak, 2008). An important method, which teachers can use to assist students acquire and device their own problem solving skills is mathematical modelling. It deals with mathematical representation-ability to use the language and tools of mathematics to communicate (Schoenfeld, 1994) by way of verbal or non-verbal expressions, written statements, graphs, matrices, equations, models and symbols like $x^2$, $\beta$, $\Pi$ and $\lambda$. Also, it represents the process of creating and investigating models of phenomena. Hauston, Blum, Huntley and Neil (1997) posited that mathematical modelling is used for classifying and exemplifying models of systems abstracted from the real world. The real world has to do with problems or situations in life that can be modelled or mathematized.

Mathematical modelling also is the method of creating relationships, translating situations to model equations and inequalities and creating computer programs for different situations (Bassanezi, 1994). Thus mathematical modelling is used to describe many activities that involve the application of mathematics. For this reason, Lassa (1981) endorsed that it is not merely a unifying theme for all applications of mathematics, but it is a key step in any creative activity in technology and indeed in most forms of the modelling process.

Mathematical modelling aims at achieving the following objectives: To find out why many students learn mathematics but find it hard to apply the knowledge in solving problems in life (Boaler, 1998); help students to understand and appreciate mathematics and its role in problem solving; provide teachers with a new method of teaching; discourage teachers from using traditional teaching methods; and to foster problem solving in mathematics.

However, mathematical modelling, whether empirical in which mathematics expressions are used to represent data or theoretical in which ordinary explanations are provided in solving problems (Lassa, 1981) has enormous advantages. For example, it helps students to develop good problem solving skills and competences (O’Callaghan, 1998); it helps them to interpret their solutions, explain the process, translate or transfer the knowledge in solving related problems and it helps them in communicating and thinking about the world (Keeves, 2002). Thinking about the world in particular is important because it is related to how students perceive and use their knowledge and
experience to explore and deal with different problems in the society giving that dealing with problems is important for the growth and development of any society. For example, when students use their knowledge of mathematics to deal with problems in agriculture, finance and health and so on, it will help stimulate societal growth and development.

Studies have shown that mathematical modelling positively influences the solution of problems in life. For example, Pothier and Sawada (1983) found out that the method helped young children contrive the concept of rational numbers. The children gained from observing, manipulating, partitioning and differentiating different objects. Langrall and Swafford (2000) found out that it helped students to solve problems involving equations. The equations were used to describe and represent different problems, establish relationships between variables, make generalizations and solve related problems in algebra involving linear and exponential functions, arithmetic sequence, and direct, proportional and inverse variations.

Similarly, Verschaffel and Decorte (1997) found out that mathematical modelling helped children to develop positive disposition towards realistic mathematics. Potari (1993) admitted that it is useful because it helps students to work individually and together in groups of two while solving problems. Boaler (2001) posited that it is important because it helps students develop more flexible forms of knowledge, which are useful in a range of situations including conceptual examination questions. In his study, Boaler discovered that students, who were placed and taught in a treatment class, out-performed their colleagues taught using traditional methods on aspect of national examination. For this reason, he recommended the use of the method especially for engaging students in learning to apply mathematics through practice beyond mere reception learning.

Despite its usefulness, mathematical modelling is hardly used in teaching mathematics due to lack of good textbooks, inability of teachers to generate good problems, the use of traditional methods and poorly developed mathematics curriculum (Odili, 2006, Lassa, 2012). Wilson, Fernandez and Hadaway (1993) for example, stated that it is not used because problem solving, which is supposed to promote the application of mathematics, is scarce in textbooks. Another reason is lack of clarity on how problem solving should be organized, taught and assessed since it is not usually regarded as a subject (Wu, Griffin, Dulhunty & Mak, 2008). This affects the application of mathematical modelling in teaching mathematics.

An important concept related to mathematical modelling is mathematization. This represents many skills in mathematics including understanding of problems, identification of relevant concepts, making assumptions and solving different problems (Wu, Griffin, Dulhunty & Mak, 2008). Students need to engage in mathematical modelling particularly mathematization to help them acquire these skills which are seldom taught in their regular lessons in mathematics.

**Theoretical/Conceptual Framework**

Mathematics focuses on problem solving inside and outside the classroom. Problem solving is a method of teaching that is defined as the process of accepting and striving to resolve challenging situations or tasks whose solutions are not known in advance (NCTM, 2000). Thus mathematics deals with the solution of problems. To solve problems successfully, students require many skills and strategies such as ability to think, plan, organize information, compute and interpret solutions based on the contexts of given problems. Based on realistic mathematics education theory, students can be taught to acquire and apply these and many more skills in problem solving in mathematics. The theory states that mathematics need to be connected to situations in real life because it is a form of human activity that is valuable and it needs to stay close to students and be relevant in the society. For this reason, students need to study mathematics based on problems that originate from contexts in life or society. This will help them learn to apply mathematics in solving problems that make sense. To encourage this, teachers need to provide good learning environment and problems that will
provide opportunity for them to look at the solution processes from different perspectives. This will ensure that what students learn is not abstract since it is abstracted from the society and it has application in life.

Furthermore, the theory states that mathematics is socially constructed because it has history, tradition and culture. For this reason, mathematics needs to be taught and applied in solving practical problems to be meaningful to students. Students on their part need to cooperate with one another in learning to achieve success. Heuvel-Panhuizen (2003) endorsed that mathematics is not just a body of mathematical knowledge but the activity of solving problems and looking for more problems in life. In addition, Freudenthal as cited by Heuvel-Panhuizen (2003) maintained that mathematics is not without solving problems, that what humans learn is not mathematics as a closed system but an activity, the process of mathematizing reality. Thus mathematics is full of problems some of which individual students cannot handle alone except through cooperation. Also, most of the problems are abstracted from different situations in life making it important that students should learn to cooperate to solve them. The solutions to the problems, according to the theory, can be obtained through guided reinvention consisting of horizontal (identifying and translating problems, and generating models and so on) and vertical (the use of symbols and formulas to prove regularities, refine and integrate models and so on) mathematisations (Potari, 1993). This knowledge is required to help students develop mathematics concepts, skills and strategies; take part actively in learning; develop mathematical tools and insights; construct new mathematical knowledge (Gravemeijer & Doorman, 1999); reprise the process of learning mathematics (Delenge, 1993); and learn to apply mathematics in problem solving.

The theory of realistic mathematics education is relevant to this study because of its emphasis on the development of problem solving skills and strategies and what teachers need to do to help students learn mathematics successfully. For example, it emphasized the need for teachers to provide opportunity for students to participate actively in the process of learning and to cooperate with one another. Also, it stressed understanding of processes to help students discover mathematics concepts for themselves and the use of multiple solution strategies. Understanding mathematical processes for instance, is important because it helps students grasp the relationships between mathematical facts, procedures, concepts and principles, and it forging the relationship between new knowledge and what students already know from in-and-out-of-school experiences (Knuth & Jones, 1991; Bot, 2012). In addition, it helps in interpreting data, and in describing information and basic mathematical concepts, rules, and laws vividly. These are all important in developing problem solving skills and strategies towards improving students’ achievement in mathematics.

Statement of the Problem

Mathematics is important, yet the performance of students is poor. To address this problem, it has been suggested that teachers should depart from using traditional methods like expository, lecture and drill which do not lead to significant improvement in performance of students in mathematics. Instead, teachers are urged to use innovative teaching methods like problem solving, programmed instruction and cooperative and collaborative learning strategies which help students to participate actively in learning and to develop positive attitudes towards mathematics.

Problem solving particularly is important in developing mathematical skills like reasoning, representations and communication among students (NCTM, 2000). Without these skills, students will find problem solving, which is the thrust of mathematics difficult. Unfortunately, teachers avoid using problem solving method because it is difficult to use, it takes too much time and the curriculum is voluminous (Odili, 2006; Wilson, Maria, Fernandez & Hadaway, 1993). But one of the concerns of educators nowadays is to look for methods of teaching that will most effectively assist students to learn mathematics leading to significant improvement in their achievement. Thus, the problem of this
The study is to see how mathematical modelling can be used to help students develop problem solving skills and strategies towards improving their achievement in mathematics? The specific objectives of the study, therefore, are to find out how students solve word problems in mathematics by way of modelling, the skills and strategies that can be used for this purpose, their level of involvement and commitment, and the extent to which the method can help improve their achievement in mathematics.

**Research questions**

In this study, the following questions were answered: i) How do students model word problems in mathematics? ii) What strategies do they use in modelling problems in mathematics? iii) What is the extent of their involvement and commitment in modelling problems in mathematics? iv) How does modelling help them to improve their achievement in mathematics?

**Hypotheses**

The following hypotheses were tested at 0.05 level of significance: i) There is no significant mean difference in achievement scores between the experimental and control groups after the experiment. ii) There is no significant mean difference in achievement scores between boys and girls in the experimental group.

**Method**

This study was conducted using quasi-experimental research design. The sample consisted of 26 SS1 (Senior Secondary One) students (14 boys and 12 girls) from Vwang (VSch-A) and Zawan (ZSch-B) community secondary schools in Jos South. The selection of the schools and sample was done using purposive sampling technique. At the time of the study, there were few student populations from each school, VSch-A had 59 and ZSch-B had 51 SS1 students. The sample was few because the selection was done based on those who volunteered and were interested in extra lessons. The two selected schools were similar in terms of quantity and quality of teachers, location, types of textbooks, performance in mathematics in junior WAEC and few students. Students from VSch-A and ZSch-B served as the experimental control groups respectively. The assignment of the students to the experimental and control groups was done randomly.

Data was collected for the study using Achievement Test in Problem Solving (ATPS). The ATPS consisted of six open-ended word problems developed by the researcher. It was validated by experts and square root method yielding a maximum validity coefficient of 0.91. The reliability was obtained using product moment correlation through SPSS yielding a coefficient of 0.82. The ATPS was used before and after the experiment as pre-test and post-test respectively.

The ATPS was developed from the mathematics curriculum matching chart for SS1 students (Macrae, Kalejaiye, Chima, Garba & Ademosu, 2001) containing problems on the applications of linear and quadratic equations, inequalities and estimation. These topics are considered important for developing problem solving skills and for relating mathematics teaching and learning to real life contexts (NCTM, 2000).

Before administering the treatment, the sample was pre-tested. After, the experimental group received several lessons on mathematical modelling taught by a trained research assistant. Each lesson lasted 1hr 20 minutes and was held three times a week for five weeks on problems in real life involving open box, plot of land, sharing of cake, trekking to school, engagement of labourers and so on. The lessons were taught based on specific word problems raised, specific objectives, previous knowledge, learning materials, introduction, presentation and evaluation.

Students in the experimental group were initially given instructions to participate actively, associate freely, use various strategies, and compute, explain and interpret their solutions. Also, they
were told that their independent strategies used correctly or not to solve the problems would be preferred, merited and appreciated.

Typical lesson in the experimental group started with introductory problem. Each student was required to read, understand, plan to solve it and execute the plan. Students were later grouped to discuss their solutions. The solution arrived at per group related to strategies used; explanations and comments provided were collated, compared and evaluated in the classroom. The learning process thus consisted of problems; and individual, small group and whole class discussions as illustrated in the following model.

A problem is first introduced in step one. It requires reading to understand what the data are, and what to solve for. Step two requires identification of variables of interest in the problem. It involves answering questions like: What is the unknown? What is the condition? Is it possible to satisfy the condition? Is the condition sufficient to determine the unknown? Step three is planning to solve the problem at individual level. It involves connecting the given data and the unknown variables and answering the following questions: Is the problem familiar? Is there a related problem? What theorems, ideas and concepts are useful? What method is useful? What illustrations, drawings, interpretations are useful? Steps four and five involve small group and class discussions respectively to obtain tentative solution to the problem. Step six involves discussion and formalization of the solution. If the problem is solved, a new one is introduced and the circle continues, if not, the process is repeated in step two.

The control group received several lessons in estimation, inequalities and linear and quadratic equations. Writing materials such as exercise books, pencils, erasers and biros were given to the sample to stimulate their interest in the study. A post-test was given at the end of the experiment. Each question in the ATPS was marked over 10, but the total marks per student was transformed to a maximum of 30 marks. The data collected was analyzed using descriptive and inferential statistics.

Results

<table>
<thead>
<tr>
<th>Skills/Strategies Used Well</th>
<th>Skills/Strategies Not Used Well</th>
<th>Skills/Strategies Not Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Making sketches/drawings</td>
<td>Identifying variables properly</td>
<td>Isolating irrelevant information</td>
</tr>
<tr>
<td>Grouping data</td>
<td>Making connections</td>
<td>Generalizing results</td>
</tr>
<tr>
<td>Reading silently</td>
<td>Formulating proper equations</td>
<td>Guessing answers</td>
</tr>
<tr>
<td>Discussion with colleagues</td>
<td>Checking/verifying solutions</td>
<td>Trial and error</td>
</tr>
<tr>
<td>Cancellation</td>
<td>Interpreting solutions</td>
<td></td>
</tr>
<tr>
<td>Substituting variables</td>
<td>Systematic approach</td>
<td></td>
</tr>
<tr>
<td>Translating statements</td>
<td>Asking of questions</td>
<td></td>
</tr>
<tr>
<td>Use of symbols</td>
<td>Copying questions</td>
<td></td>
</tr>
<tr>
<td>Use of operations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 1 shows that the students in the experimental group, as observed, demonstrated different skills and strategies in their problem solving activities by way of modelling. These are classified into three categories viz. those observed to be common and used well, those observed to be common but not used well and those observed to be common but not used in their problem solving. For example, the table shows that the common ones used well include sketches, drawings, illustration, grouping data and substituting variables. Those that are common but which were not well utilized include proper identification of variables, making connections, checking/verifying solutions and formulating correct statements/equations. Those that were not used include isolating relevant from irrelevant data or information, guessing and generalizing results probably because these require higher level thinking and abstraction which are difficult to do.

**Table 2. Summary of Range of Marks and Percentages Obtained by Students in ATPS in the Experimental and Control Groups**

<table>
<thead>
<tr>
<th>Group</th>
<th>Experimental</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marks</td>
<td>Freq</td>
<td>Percentage</td>
</tr>
<tr>
<td>1-5</td>
<td>1</td>
<td>7.692</td>
</tr>
<tr>
<td>6-10</td>
<td>6</td>
<td>46.154</td>
</tr>
<tr>
<td>11-15</td>
<td>5</td>
<td>38.462</td>
</tr>
<tr>
<td>16-20</td>
<td>1</td>
<td>7.692</td>
</tr>
<tr>
<td>21-25</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>26-30</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2 shows that from the control group, 7 (53.85%) students scored between 1 to 5 marks while none scored above 10 marks. From the experimental group, 1 (7.692%) student scored less than 5 marks, 5 (38.462%) students scored between 11 and 15 marks while none scored above 20 marks. Certainly, these results are poor showing that the students found it difficult solving word problems in mathematics. Probably, this was due to poor background knowledge and experience in mathematics. However, comparatively, the experimental group achieved better than the control group with a range of marks between 1-20 as opposed to the range of marks between 1-10 in the control group.

**Table 3. The Level of Influence of Mathematical Modelling in Developing Problem Solving Skills among Students in the Experimental group**

<table>
<thead>
<tr>
<th>Problem Solving Skills</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application of independent solution strategies.</td>
<td>Considerable</td>
<td>Not considerable</td>
</tr>
<tr>
<td>Level of involvement in classroom discussion.</td>
<td>Considerable</td>
<td>Considerable</td>
</tr>
<tr>
<td>Interactions with teacher as a guide at individual and group levels.</td>
<td>Considerable</td>
<td>Not considerable</td>
</tr>
<tr>
<td>Interaction with given problems e.g. perseverance, motivation, etc.</td>
<td>Very</td>
<td>Somewhat</td>
</tr>
<tr>
<td>Use of illustrations in solving problems.</td>
<td>Committed</td>
<td>committed</td>
</tr>
<tr>
<td>Writing and explaining reasoning behind solution strategies.</td>
<td>Committed</td>
<td>Uncommitted</td>
</tr>
<tr>
<td></td>
<td>Committed</td>
<td>Uncommitted</td>
</tr>
</tbody>
</table>
On the level of commitment and involvement of the students in modelling the word problems using different solution strategies, Table 3 shows that boys exhibited considerable level of interaction with the problems, application of independent solution strategies and interaction in the class. They showed commitment in making illustrations, understanding the problems, writing and explaining their solution processes at individual and group levels and in their interactions.

The girls on the other hand did not exhibit considerable level in using independent solution strategies and interactions. They were neither committed in writing and explaining their solutions nor committed in making illustrations. However, they were somewhat committed in solving the problems and exhibited considerable level of involvement in group and class discussions. Consequently, the treatment positively influenced the experimental group, but boys tend to enjoy it more than the girls though their overall performance was discouraging. However, it is difficult to conclude that the treatment significantly influenced the students or boys more than girls in the way they enjoyed the modelling activities except a scientific investigation is carried out.

Table 4. Calculated Student t-test for the Difference between the Means of the Experimental and Control groups in ATPS

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>( \bar{x} )</th>
<th>SD</th>
<th>t-cal</th>
<th>t-table</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>13</td>
<td>9.54</td>
<td>3.1</td>
<td>3.95</td>
<td>2.06</td>
<td>24</td>
</tr>
<tr>
<td>Control</td>
<td>13</td>
<td>5.31</td>
<td>2.3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From Table 4, the calculated value of t-test 3.95 is more than its table value 2.06 at 0.05 level of significance. The null hypothesis is, therefore, rejected meaning that there is a statistically significant mean difference between the achievement of the experimental and control groups in the ATPS. The difference is in favour of the experimental group, that is, it performed better than the control group.

Table 5. Summary of Cohen’s d Calculation of Achievement Gain in ATPS Between the Experimental and Control Group

<table>
<thead>
<tr>
<th>Group</th>
<th>( \bar{x} )</th>
<th>( \Sigma )</th>
<th>( \sigma )-pooled</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>9.5</td>
<td>9.6</td>
<td>7.79</td>
<td>0.5</td>
</tr>
<tr>
<td>Control</td>
<td>5.3</td>
<td>5.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5 shows the effect size (d) equals 0.5. This value, at 69 percentile standing on the Cohen’s rating scale, represents 33.0% gain in favour of the experimental group. This is a medium gain for the experimental group over the control group. This shows that students in the experimental group gained about one-third in their development of problem solving skills over and above their colleagues in the control group.

Table 6. Calculated Student t-test for the Mean Difference between Achievements of Students in the Experimental group in ATPS Based on Gender

<table>
<thead>
<tr>
<th>Group</th>
<th>Sex</th>
<th>N</th>
<th>( \bar{x} )</th>
<th>SD</th>
<th>t-cal</th>
<th>t-table</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>Boys</td>
<td>7</td>
<td>10.57</td>
<td>3.66</td>
<td>1.38</td>
<td>2.20</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Girls</td>
<td>6</td>
<td>8.33</td>
<td>1.6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From Table 6, the results show that the t-test calculated value 1.38 is less than its table value 2.20 at 0.05 level of significance. Therefore, the null hypothesis is accepted meaning that there is no statistically significant mean difference in the achievement of students in the experimental group in ATPS based on gender. Thus both boys and girls benefitted equally from the treatment.
Discussion

In solving problems in mathematics and in real life, students require mathematical skills and strategies to be successful. Problem solving particularly mathematical modelling is useful because it helps equip students with necessary skills and strategies to be able to tackle different problems with little or no challenges. The outcome of this study demonstrated that mathematical modelling is useful in teaching students to understand and solve word problems in mathematics. For example, the results show that mathematical modelling helped in developing their problem solving skills and strategies. It helped improve their achievement better than the use of traditional teaching methods (Table 2) even though the overall results tend to be discouragingly poor probably due to their poor mathematical knowledge and experiences. Despite the seeming poor results, it helped boys more than girls in the experimental group in the way they enjoyed problem solving through modelling with a considerable level of involvement and commitment (Table 3). The students used different skills and strategies to tackle the problems ranging from sketches, drawings, illustrations, reading, re-reading, discussion, explanations, interpretations to demonstration and so on and so forth. These helped to increase their comprehension level and their ability to solve the word problems. This concurred with Pothier and Sawada (1983) that mathematical modelling is useful in many respect.

Also found from the study is that students ability to enjoy learning to solve word problems in mathematics increased considerably (Table 3) for boys as opposed to girls in the experimental group. This concurs with Verschaffel and Decorte (1997). Furthermore, Table 4 shows that the experimental group performed significantly better than the control group. Table 5 shows that it gained more than the control group with about 33.0% effect size. This concurred with Boaler (2001) who discovered that mathematical modelling helped students to solve problems better than traditional methods. Also, it concurred with Ali, Akhter, Hukamdad and Khan (2010) who admitted that problem solving leads to better achievement than traditional methods in mathematics instruction. Based on gender however, the boys and girls in the experimental benefitted from the method because it helped improve their achievement without significant mean difference. This contradicts the findings that boys perform better than girls in mathematics with significant mean difference (Cox, 2000; Kolawale, 2007) but concur with the findings that the mean difference is not statically significant (Bot, 2012).

Conclusion

Based on the findings of this study, it is concluded that mathematical modelling is effective in teaching students to develop problem solving skills and strategies. The method is helpful and it leads to a significant mean difference in achievement in problem solving in mathematics irrespective of the gender of students.

Recommendations

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

i. Teachers should utilize mathematical modelling in teaching problem solving in mathematics.

ii. They should encourage students to use their solution strategies to solve problems in mathematics.

iii. Problem solving activities should be contrived and used by teachers and textbook authors should assist by producing materials that help foster the development of problem solving skills and strategies among students.

iv. Teachers should encourage students, especially female students, to engage in finding solutions to problems in mathematics through cooperation and collaboration with their
colleagues. This will help stimulate their ability to enjoy and develop interest in mathematics.
References


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Abstract
This article reports on a study of international students’ experience in speaking English through intercultural communication in Malaysia. Phenomenological methods were employed to collect information about seven international EFL postgraduates’ experience in speaking English through intercultural communication in Malaysia. It was found that the international EFL postgraduates involved in this study preferred to interact with their international peers instead of local students. Also they enjoyed communicating with good English speakers, who would play a productive role in their English learning; whereas those who are less desirable English speakers would play a negative role in their English language acquisition. In addition, participants consider Malaysian English spoken by local students inaccurate and badly pronounced, while international students’ English is more desirable to get exposed to. In general, participants rated Malaysia a better destination in terms of learning English compared to their home countries but a less favorable one compared to native English speaking countries due to the less satisfactory English proficiency of both local and international students. Moreover, participants added they had benefited much from knowledgeable and approachable lecturers who were excellent English speakers in terms of English learning.

Keywords: international EFL postgraduates; intercultural communication; English proficiency.
Introduction

Malaysia has seen a steady raise in international students’ population for the past one and a half decade (Sirat, 2008). Traditionally, the large number of international students have come from the neighboring Asian countries of Indonesia, Thailand, Bangladesh, the Maldives, Singapore and, overwhelmingly, China (Verbik & Lasanowski, 2007). However, the impact of September 11 has made applicants from the Middle East change their destinations to countries such as Malaysia, which has emerged as an important nation for students from the Middle East (Sirat, 2008). Accordingly, in the university where this study was carried out, the largest international student community has been formed by Iranian students. According to The Malaysian Insider online (28, June 2013), Malaysia has achieved a world ranking of 11th in terms of total international student population from around the world, which was because of the burgeoning international student population in Malaysia, which has risen above 90,000, or the equivalent of around two per cent of the total international student population in the world as of June 2013. Therefore, it is not rare to see international students in every corner of local universities and colleges, intermingling with local and other international students. In terms of language used, international students automatically switched to English language as a common language when interacting with students from a different lingual background. This paper aims to get in-depth insight into international EFL postgraduates’ speaking English experience through intercultural communication.

Previous literature on speaking English through intercultural communication falls into the schools of applied linguistics and English as a common language in intercultural communication. Take applied linguistics for example, researchers such as Long put forward Interaction Hypothesis (1983a, 1983b, 1985,1996) which proposed that interaction facilitated acquisition due to the conversational and linguistic modifications that happen in such discourse and that provided learners with the input they needed. Notions of input and interaction partly comprise the concept of linguistic environment. As it was pointed by Freeman and Long (1991), the role (if any) of environmental factors in first or second language acquisition affects the power and scope of any innate linguistic or cognitive contribution it becomes necessary to posit in the learner.

Mackey (1999) concludes because of output hypothesis that learners need to obtain the opportunities to produce output through interaction in order to facilitate second language acquisition (SLA). Swain and Lapkin (1995) held the view that in producing an L2, learners will occasionally become aware of a linguistic problem. “Noticing a problem can ‘push’ learners to modify their output. In doing so, learners may sometimes be forced into a more syntactic processing mode than might occur in comprehension” (p. 371).

Relevant studies have been conducted among native speakers (NS) /Non-native speakers (NNS), especially with NNS children and NS adults. However, not many researchers such as Gass and Varonis (1985) who had taken a look at NNS/NNS conversation and addressed the importance of negotiation among NNS/NNS in terms of SLA.

When it comes to Malaysian context, research on SLA has targeted at local students leaving international students communities seldom touched. The present literature on international students in Malaysia has examined several aspects of their learning context, including their perceptions of their language courses, matters in the ESL classroom, the assessment of their English proficiency, their perceptions of multicultural interaction, learning experience (Noori, in press), and their English learning beliefs and perceptions. One common conclusion drawn from all these studies is the undeniable significance of English proficiency in these students’ academic and social experience as international students in Malaysia (Noori, in press). Whereas most of the students are to some extent dissatisfied with their language teachers. As Hamzah was cited in Noori’s study (in press) that one student was quoted as saying that Malaysia was not a English speaking country.
However, there is few research probing into their experience in speaking English with both international and local students, lecturers and even strangers through intercultural communication in particular, which is something going on in their everyday life.

When it comes to intercultural communication in English as a lingua franca (ELF), previous studies examine the problematic part of the communication, such as misunderstanding and communication breakdown as participants depend on the norms of their mother tongue and native culture to interpret meaning (Kaur, 2011). In addition, there is research focusing on the transformation of English language through intercultural communication, such as the emergence of Nigerian, Indian, Philippine, Singaporean Englishness as the language spread globally (Yano, 2006). As it was put by Yano (2006) “English has developed into local varieties by adopting and adapting to local languages and cultures in its process of inevitable localization and internalization” (p. 3). Whereas this study will not be limited to the problematic matters of intercultural communication in English, but the participants’ experience as a whole in speaking the language in the communicative activities and their aspirations and efforts in pursuing for the standard and accuracy of the language.

Methodology
In order to explore in-depth insights into the international EFL postgraduates’ experience in speaking English through intercultural communication, a phenomenological study was carried out among international EFL postgraduates in a local university. In-depth individual interviews with international EFL postgraduates were conducted. Seven interviewees from seven different countries were involved in the research, who talked about their academic and daily life experience in Malaysia, through which they shared their stories studying and socializing with local and international students here. Perspectives on their English learning experience, particularly speaking English, were put forward, especially using English inside and outside the classroom through intercultural interaction with peers and lecturers.

Participants
Seven participants involved in this research are current postgraduate students studying in a local public university in Malaysia, who were chosen based on criteria served to achieve the research objective. Six male and one female participant, aged from 23 to 45, come from different lingual and cultural background and have stayed in Malaysia for different length, ranging from eight months to five years. They have accumulated certain experience of living and studying in this country and were willing to share their perspectives on their experience in speaking English through intercultural communicative activities. They are from Asia and Africa, namely Bangladesh, China, Iran, Iraq, Pakistan, Palestine and Sudan. All of them have learned English as a foreign language for a different time span and their English proficiency varies. Some of them participated IELTS and had reached the required score that their majors needed, which is supposed to be above an overall score of 6, and some of them enrolled in language classes for three months before starting their programs. Two of them major in Master of English as a Second Language who pay particular attention to English language in a sense.

Instrument
The instrument used in this study is interview, which is formed through reading related studies and the interview questions used in Noori’s (in press) research on international students’ perspectives in learning English in Malaysia. A pilot interview with one of the participants was conducted in advance, which provided rewarding feedback in refining the interview questions and the way of interviewing. The finalized seven individual interviews were conducted in a semi-structured way. Participants were encouraged to talk in a relaxing atmosphere about their experiences of interacting with local and international counterparts, their perspectives on intercultural
communication and their opinions about their English language proficiency through intercultural communication. Interviews were carried out in places where interviewees felt like staying, namely coffee shops, library, open outdoor areas and dormitories. Interviews were recorded and transcribed, which were presented to interviewees along with interpretations. With the agreement of participants, results and analysis were put forward in this study.

Findings
Results based on the data analysis falls into a few themes, namely, English speaking proficiency, intercultural communication competence and the improvement of English proficiency.

English Speaking Proficiency
Some participants believe language proficiency, especially speaking proficiency plays a very important role in interaction. They said they had difficulties understanding some international students who had quite an accent, “for example the ‘r’ sound by Pakistani students and the Indian accent” quoted from one participant, which takes time for him to get used to. Also they have encountered difficulty interacting with local students who have a typical Malaysian accent. Moreover, most of the participants believe that Malaysian English is not Standard English compared to the English in prevalence in Native English speaking countries. As one participant stated that students who went to English speaking countries could ‘get standard English easily’. In this sense, participants are seeking more standard and accurate English in their academic and social life; therefore they tend not to be influenced by local students, which is exactly a reflection of Giles’ (1991) divergence notion that speakers accentuate speech and nonverbal differences between them and others.

In addition, participants prefer to interact more with students who have quite advanced English proficiency, which would be ‘productive’ to their English whereas keeping talking with people whose English is of lower level would have a ‘redundant’ effect on their language according to one participant. Regarding the English language environment, all the participants agreed that the exposure in their university and some parts of the country was more prevalent than their home country, whereas the English proficiency generally is not satisfactory, which could be ‘average’ according to one participant, whereas it could be low level to some participants. In addition, local students tend not to speak English in their own community, which greatly decreases the chances of getting exposed to English.

When it comes to interacting with lecturers, students believe that they have met knowledgeable and approachable lecturers who have been a great source for them to benefit academically and linguistically. Unanimously they agree that some of their lecturers’ English is quite good, whereas some do have an accent, which takes time to get used to. One participant revealed that one of his lecturers had difficulty in delivering lecture in English, who asked them to turn to local students whenever he switched to Bahasa Malaysia.

Furthermore, the majority of participants believe their English speaking proficiency has seen substantial improvement, fluency in particular; whereas others are expecting a more satisfactory change for the better. All participants believe that they have benefited much from lecturers in English learning, mainly academic writing, however, some professors’ English language proficiency is less desirable.

To summarize, International EFL postgraduates involved in this research believe that Malaysia is a less favorable destination in terms of attaining English proficiency due to the lack of exposure to standard and accurate English, which adds more challenge in improving their language proficiency.
**Intercultural Communication Competence**

Apart from English speaking proficiency, that facilitates intercultural communication, other matters, such as willingness to interact, cultural similarity and sometimes cultural difference, personality and same values boost intercultural communication as well. Participants revealed that international students were willing to get engaged in intercultural communication in English with both international and local students in academic and daily life. They would like to talk about different cultures, academic matters and everyday life topics. Some participants believed cultural similarity would play a positive role in intercultural communication, for example, one participant from Palestine said it was easy for him to socialize with Iranians, because they were all called Middle Easterners. Another participant shared his story of early stage of staying in Malaysia, he found it easier to communicate with local Muslims because of the same religious belief, while he also concerned about interacting with people from similar cultural background, which might stop him from interacting with people from other cultural and lingual background, which would have enriched his interaction and would have offered an opportunity to get to used to different accents. Plus common values shared by people from different cultures promotes communication as well. One participant would share his personal feelings with his international friends. As he said:

“I have this friend of mine from Palestine. We talk about, I talk about his family. I talk about my family. We talk about our dreams and ambitions a lot of times. So we a lot of times have a great deal of encouragement toward each other when each of us is down.”

However, intercultural communication does not go well on many occasions due to a number of factors, namely accent difference, unwillingness of socializing and English language proficiency. Participants admit that it is generally easier to interact with international students on one hand, on the other sometimes it does not go quite well with local students. Most of the participants hold the idea that it is quite smooth to interact with international students and even to become close friends, because of the same value they share and they are more comfortable with international students’ way of speaking English. The majority of interviewees added that they had difficulties interacting with local students due to a range of reasons. Firstly, one participant feels uncomfortable about the fact that local students tend to talk about religion to some extent, which to him is a very ‘personal’ matter instead of a casual everyday topic with people that are not very close to him. This becomes a ‘barrier’ for the interpersonal relationship to go deeper. Some participants said that local students, especially ‘male Malays were not willing to interact with international students, and most of them said that they did not have local friends. One male participant had the conclusion that it was difficult to interact with male Malays, whereas he did not encounter such a difficulty when it came to female Malays. Another male participant thought that local students were ‘well-mannered and helpful but there was a place where the relationship stopped’, because after a few meetings there were not much to talk about, whereas with other international friends he could talk about more personal topics, such as their dreams and plans after graduation.

**Improving English Proficiency**

This study looks at seven international EFL postgraduates’ English speaking experience in Malaysia and reveals that intercultural communication offers opportunities for them to get exposed to English whereas it takes time and efforts to attain higher English proficiency due to the less satisfactory English level of both local and international students around. It was found that participants with higher English language proficiency tended to expect advanced proficiency from their interlocutors and would believe Malaysian English spoken by locals as wrong and not worth exposing to. In this sense, they have a tendency to socialize with students who have attained reasonable English proficiency. Through intercultural communication, they obtained friendship,
information, chances of using English, whereas the improvement is not satisfactory due to the less satisfactory Standard English language exposure.

As it is cited in Mackey and Silver (2004):

“Researchers such as Long (1996), Gass (2003) and Mackey (in press) have argued that task-based interaction can provide the necessary connections between input, output, attention, feedback, and noticing, thus increasing the saliency and comprehension of many aspects of language and ultimately driving the L2 acquisition process forward.”

Adequate English exposure is like a book, which offers massive input to the learners, whereas the less desirable English environment in Malaysia adds challenge for international EFL postgraduates to polish up their language. Participants are skeptical about the local English, which they are afraid, would play a negative part in their English in terms of accent and word choice. Therefore, they tend to interact with other international students especially those who have gained reasonable English proficiency since they can not get exposed to authentic native English speakers. In this sense, it is crucial to take advantage of any opportunities to get exposed to accurate English, for instance, conferences, seminars, renowned lecturers and cyber resources, such as speeches, online courses and documentaries, etc. English learning and acquisition could be a long-term endeavor, especially when in a less favorable English context. Any effort to attain higher English proficiency would be rewarding.

When it comes to intercultural communication, it is a matter of dealing with difference. Bennett (1998) suggested understand it, appreciate it, and respect it, which is central to all practical treatments of intercultural communication.

International students tend to interact with their international peers, which is the common practice in the local university where the study was carried out, and it is shown in the study that the similar cultural background facilitates intercultural communication; however one participant believes that “Human beings have a lot in common.” Hence if there is possibility for the relationship with local students to work it will take efforts from both sides. As participants revealed that some local students tended to socialize within their own group. If the willingness to get to know a person is not there, chances are the relationship will probably go no where, In addition, some participants are not confident in interacting with lecturers, who obviously have more knowledge and experience in the academic field. Interacting with lecturer is part of intercultural communication, which requires reasonable English proficiency and respecting the work ethics of the lecturers.
Reference:


