SOUTH AFRICA INTERNATIONAL CONFERENCE ON EDUCATION

21 – 23 September 2014

"Rethinking Teaching and Learning in the 21st Century"

# Proceedings


SAICE
South Africa International Conference on Education

Held at Manhattan Hotel Pretoria, South Africa


AARF
African Academic Research Forum

**Editors**

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**Preface**

The South Africa International Conference on Education (SAICE) is a scientific conference organised by the African Academic Research Forum to address issues raised by academics, researchers and other professionals with interest in education. SAICE 2014 was meant to offer a platform for academics and researchers to share their research, deliberate on issues relating to education, and off course establish networks with colleagues from different countries. Importantly, this afforded participants opportunities to present a wide range of perspectives, scholarship and expertise in the pursuit of excellence in education.

Teaching and learners in the 21st Century are faced with a wide variety of opportunities and challenges. These are obviously different from the challenges and opportunities prevalent in the previous century. It is against this backdrop that there is need for rethinking of the how teaching and learning occurs within our classrooms.

These proceedings contain the accepted full manuscripts that were presented at SAICE 2014. A total of 126 manuscripts were received from participants from 21 Countries. This in a sense attests to the wide range of and varied contexts of the presentations. Hopefully, the presentations will result in an understanding of how others are addressing different problems as well as in a crossbreeding of ideas.

We wish to welcome all the participants to Pretoria. A special word of welcome goes also to those who are visiting Africa for the first time.

We would like to thank the keynote speakers for the most wonderful and thought provoking presentations. Our appreciation also goes to the reviewers of the full manuscripts as well as the editors who have worked tirelessly to ensure that the proceedings were compiled timeously.

To each one of you, enjoy the conference as we 'rethink Teaching and Leaning in the 21st Century'.

The SAICE conference is to be an annual event. We therefore look forward to once more meeting you in the 2015 edition of the conference.


Prof. A. Mji
*Conference Chair*

**List of Reviewers**

The organising committee of SAICE 2014 would like to greatly thank the following reviewers who meticulously reviewed the conference papers.

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**Review Process**

In total, 126 manuscripts in different areas within the field of Education were received. Of these manuscripts, 52 were intended to be full papers while the rest were to be short papers. All the full manuscripts were subjected to a double blind review. The reviews were carried out by experts from different countries. Their brief was to base their reviews on 19 criteria they were supplied with. They were also requested to look at the manuscripts with the aim of assisting authors to produce good quality presentations.

Following the review process, the editorial committee considered the reviewers' comments and 18 manuscripts were found to be unsuitable for publication. Reports were forwarded to the remaining 34 authors with suggestions of what needed to be addressed. After receiving the re-worked manuscripts, the editorial committee finally accepted 29 for inclusion in the proceedings. This means that the acceptance rate was just about 56%.

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**Editorial Committee**

M. Dichaba

D. Nwaozuzu

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* Keynote paper.

# EDUCATION, CULTURE AND TECHNOLOGY FOR DEVELOPMENT AND SUSTAINABILITY IN AFRICA: ISSUES OF SOLAR ELECTRICITY GENERATION AND IMPACT OF ICT IMPLEMENTATION

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## Abstract

This keynote address gives an overview of education from the standpoints of philosophy, structure and mode of delivery. Education is a tool and a means for personal and community liberation. Its role and importance cannot be underestimated. Technology has been responsible for mammoth changes in the content of process of education delivered worldwide. In examining culture and history, in-depth consideration is given to emerging economy status of most African countries in relation to that of advanced nations, their roles and influence on life and business. A lot of countries in Africa are faced with economic decline, energy crisis, insufficient capital resources, lack of availability and investment in technology, insufficient food supplies and serious draught. Problems with transport and communications in most part of Africa remain unchanged, although the advent of mobile phones has helped slightly in enabling people to share and exchange information and resources to improve life and access to resources in rural areas. ICT is a powerful tool for boosting economic growth, education, poverty reduction, improving health and improving democracy. This certainly will be the case if ICT is accessible by the majority. Inadequate and unreliable electricity generation has a direct impact on ICT development and implementation since all ICT devices use and need regular supply of electricity. With the current problems of power generation in most African countries, having reliable and adequate electricity, both in rural and urban areas, remains one of the key problems to overcome. Most African countries lie on the sunshine belt. This makes solar electricity the continent's most cost-efficient and reliable way of generating electricity for ICT devices. This paper discusses in-depth how solar electricity can be developed and used to tackle grid electricity related problems in African countries suffering from unreliable and inadequate grid electricity. We review and present activities in the field of renewable energy applications in some African countries. This is followed by discussion of some of the socioeconomic benefits that these countries have derived from use of these approaches. We examine systems and propose intensification of solar-based energy generation education schemes in the curriculum for schools colleges and in higher education. The paper investigates issues of co-operation amongst various solar electricity stakeholders in Africa other parts of the world. Our research study shows some of the potential benefits of solar electricity generation for ICT use in Africa. These are linked to education improvement, business growth, entrepreneurship, health and economic development.

## 1. Introduction

We have witnessed the turn of a century and have experience rapid advancement in technology throughout the world. Such advancement has resulted in improved ways of living for a lot more people in the world. There are now faster means of travel, access to regular energy supply to power all types of devices. We have seen the steady improvement in how people communication using not only landline based telephone systems but mobile devices including smart phones with wireless capability using the likes of Skype, Google+, etc. In this era of globalization life is made easier for those who have and/or have access to current technologies. The mobile phone, internet (web) and associated smart devices make people equal players on the global stage. However there is still the

challenge of the digital divide that need to be addressed. This is a "divide" that exist in virtually all communities at global, national and local levels.

In the past two decades, Information and Communication Technology (ICT) has been widely perceived as a means of effecting changes in various sectors so as to achieve the developmental goals. Pigato (2001) and Ngoma (2010) regards ICT as a reliable vehicle for education, a platform for communication, a means for improvement in health and a powerful tool for economic growth. Ngoma (2010) argue that the great use of ICTs creates 'intangible assets' (in the form, for example, of organisation or managerial improvements), which contribute to increasing the overall efficiency of all sectors of production, thus increasing the total factor of productivity and sustainable economy. Tambo (2004) consider investment in ICT as a capital input which contributes to overall capital-deepening in other sectors, thus helping to increase labour productivity. Africa Partnership Forum, APF (2008) views ICT as tool for increasing efficiency that provide access to new markets or services, create new opportunities for income generation, improve governance, and give poor people a voice. In addition, production of ICT goods and services contributes significantly to the economic success of developed countries (e.g. Finland and USA) (Wangwa, 2007) and few developing countries in Asia such as China and India (Pigato, 2001). There are also less tangible but equally crucial benefits of increased connectivity to information networks thus reducing the distance of travelling (Diessen, 2008). In a wider context, ICT has been seen as a 'gateway for successful economic and social transition' (UN, 2009).

In developed countries where ICT has been applied extensively, research indicates that ICT offers increased opportunities for sustainable economic development and plays a critical role in rapid economic growth, productive capacity improvements, education, government, agriculture and international competitiveness enhancement (Berndt et al., 1992; Lau and Tokutsu, 1992; Morrison, 1997; Daveri, 2000; Schreyer, 2000; OECD, 2002; Indjikian and Siegel, 2005). Econometric studies have found evidence of a strong positive relationship between ICT investments and Gross Domestic Product (GDP) growth illustrating the importance of ICTs for development, both in the commercial and the public sectors. For example, OECD (2002) found that in USA, ICT investments accounted between 0.5% and 1.0% in GDP growth per capita per annum in 1995–1999 periods. More examples on ICT contribution to the growth of GDP in Germany, France, UK, Canada and Australia is given in table 1.

**Table 1** The impact of ICT on GDP growth, results from national studies (adapted from OECD, 2002).

| Country | GDP growth (%) | | Contribution of ICT (%) | | Year | |
|---|---|---|---|---|---|---|
| USA | NA | NA | 0.5 | 0.9 | 91-95 | 96-99 |
| | 2.5 | 4.0 | 0.5 | 1.0 | 90-95 | 95-99 |
| | NA | NA | 0.4 | 0.9 | 90-95 | 95-00 |
| Germany | 2.2 | 2.5 | 0.4 | 0.5 | 90-95 | 95-00 |
| France | 0.5 | 2.2 | 0.2 | 0.5 | 90-95 | 95-00 |
| UK | 1.4 | 3.1 | 0.4 | 0.6 | 89-94 | 94-98 |
| Canada | 1.5 | 4.9 | 0.4 | 0.7 | 88-95 | 95-00 |
| | 1.9 | 4.8 | 0.3 | 0.5 | 91-95 | 96-00 |
| Australia | NA | NA | 0.7 | 1.3 | 89/90 | 94/95 |
| | 1.8 | 4.9 | 0.9 | 1.3 | 94/95 | 99/00 |

Among the developing countries that have benefited through the use and/ or production of ICT are China, India, Malaysia, Philippines, Thailand, South Korea, Taiwan and Singapore (IMF, 2001;

Kuppusamy and Shanmugam, 2007). In the post-communist countries, ICT investment contributed to about 16% of GDP growth in Poland for the period of 1995-2000 (Piatkowski, 2003).

Africa, like all developing regions, is faced with economic decline (Bloom et al., 1998), energy crisis (UNIDO, 2009; OFID, 2010), insufficient capital resources (FAO, 2002), climate changes (APF, 2007; UNIDO, 2009), environmental degradation (Vlassoff et al., 1986), lack of availability and investment in technology (Jimba, 2000), insufficient food supplies (Maxwell, 1998), high rate of unemployment (Maxwell, 1998), impact of HIV/AIDS (Foster and Williamson, 2000; Buvé et al., 2002) and serious draught (Vlassoff et al., 1986). Problems with transport and communications in most part of Africa also remain unchanged, albeit, the advent of mobile phones has helped slightly in enabling people to share and exchange information and resources to improve life and access to resources in rural areas (Scott et al., 2004; Ngumbuke, 2010). However, some of these large scale problems can be addressed if education is promoted with access to and use of ICT made possible for the people in the public, private and voluntary sectors. Furthermore, competing in the global market has become more challenging and complex and therefore attaining competitiveness is not only about liberalisation of the economy, but also entails how far ICT is being used in the country. Therefore, wider diffusion of ICT is vital to ensure African countries welfare. Adebgola (1998) argues that deliberate steps should be taken to make sure that both urban and rural communities have access to ICTs. He predicted that if this is not done, the so-called digital-divide will just widen, which in turn increases poverty among many societies in Africa.

Many studies have identified various sectors in Africa where ICT can make a great impact as summarized in table 2. Adeya (2002) has reviewed most of the cited works in table 2 and discussed in details on how ICTs can contribute in solving some of the aforementioned problems in Africa. While there is sufficient evidence (as discussed previously) that ICT has significantly contributed to the overall economic growth and other sectors in developed countries and some developing countries in Asia, specifically China and India, the impacts of ICT in most African countries has yet to be seen due to various constraints. The major constraints facing the ICT sector in most African countries include:

- Lack of proper policies and strategies that facilitates the use of ICT in both rural and urban areas (Adam and Wood, 1999; Raji et al., 2006),
- Lack of management understanding of effective ICT use (Adam and Wood, 1999),
- Incompetent management and lack of commitment from management (Adam and Wood, 1999),
- Institutional rigidities and constraints to learning (Adam and Wood, 1999),
- High cost of the technology such as high cost of bandwidth (Raji et al., 2006), high cost of ICT equipment (Adam and Wood, 1999),
- Inadequate and unevenly distributed infrastructure (Adam and Wood, 1999; APF, 2008),
- Lack of local content and language barrier (Raji et al., 2006),
- Lack of private sector involvement (i.e. ICT manufacturers and operators) in designing ICTs suitable for poor countries (Adam and Wood, 1999; APF, 2008),
- Lack of human resource capacity which limits the ICT implementation (Adam and Wood, 1999; Raji et al., 2006; Farrell et al., 2007),
- Poor import tax regulations which results in increase of the technology cost (Farrell et al., 2007) and
- Lack of sustainability, i.e., meeting the ongoing costs of maintaining equipment, staff training, connectivity and content materials acquisition (Adam and Wood, 1999; Farrell et al., 2007).

**Table 2** The identified impact of the ICT in African.

| Government (Adam and Wood, 1999; Ningo, 1999; Opoku-Mensah, 2000; Molony, 2006; Jacobson, 2007; APF, 2008) | Education (Calderoni, 1998, Adam and Wood, 1999; Elmer, 1999; Perraton, 2000; Jackson, 2005; Molony, 2006; Jacobson, 2007; APF, 2008) | Business (Adam and Wood, 1999; Jackson, 2005; Molony, 2006; Jacobson, 2007) | Organisations (Jacobson, 2004; Jackson, 2005; Jacobson, 2007) | Individuals (Jacobson, 2004; Jackson, 2005; Molony, 2006; Jacobson, 2007) |
|---|---|---|---|---|
| Intensive application of ICT in Substantive sectors | Increasing use of computers in education | Emergence of a new breed of information workers | Improved awareness of ICT | Cost saving |
| Cost saving and availability of tools within the range of public institutions | Pressure for new ways of teaching and learning in higher education | Spread of ICT knowledge through or by business institutions | Greater opportunities in cost savings and new areas of ICT application | Possibilities to participate in global lists |
| Reduction of gaps between poor and rich, urban and rural | Improving communication among researchers and research institutions | Opportunities for employment | Changes in the roles of professionals in organisations | Professional diversification and job satisfaction |
| Improvement of horizontal communication in government institutions | ICT gives students access to a much wider variety of resources | | Increased numbers of outlets for access to information | |

| Health (Bopp et al., 1997; Driscoll, 2001; Molony, 2006; Raji et al., 2006) | Social well-being (Adam and Wood, 1999; Cavanaugh, 2001; Adeya, 2002; Molony, 2006) | Employment (Adam and Wood, 1999; Bhatnagar, 2000) | Poverty eradiation (Flor, 2001; Adeaya, 2002; Addo-Dankwa, 2002; Hazan, 2002) | Agriculture Richardson, 1996; 1997; McConnell, 2000, Munyua, 2000) |
|---|---|---|---|---|
| Enabled remote consultation, diagnosis and treatment through telemedicine | Increasing general sociability within and outside the country | Basic training in ICT can provide employment in electronic repair and information handling services | Information leads to opportunities that generate resources | Communicating market price information and developing land registries |
| Facilitated collaboration and cooperation among health workers, including sharing of learning and training approaches | To enhance social well being and participate more actively in society, internationally as well as nationally | | Access to information leads to access to resources | Communicating agro-meteorological information and facilitating networks of agricultural researchers and farmers |
| Supported more effective health research and the dissemination and access to research findings | | | The potential of providing employment opportunities for those appropriately trained | Using internet for learning about agricultural techniques used in developed countries |

While all these are very important and necessary conditions for implementation of ICT in Africa, they are not sufficient conditions. Electricity availability and reliability is the major pre-condition due to the fact that all ICT devices use and need regular supply of electricity. It is impossible to operate any form of ICT device in remote locations without electricity or in urban areas without adequate and reliable grid electricity. In fact, ICT would have no significant impact if the website in the rural areas cannot be accessed because of lack of electricity or computers cannot be used in urban areas because of grid electricity rationing. Since ICT can make impact to all developmental activities (education, good governance, business, health, agriculture, industry and trade), it is anticipated that as soon as ICT becomes accessible to most people in the public, private and voluntary sectors (both urban and rural areas), new employment, good sales markets, information on health, education, micro-entrepreneurial and social development opportunities will emerge. These will result in poverty reduction in most countries in Africa.

## 2. Status of Electricity in Africa

### 2.1 Non-renewable Energy Sources for Electricity Generation

Africa is blessed with vast amount of non-renewable electrical energy resources (such as petroleum, natural gas, coal and uranium) that far exceed its electrical energy demand requirements for the next several decades (UNIDO, 2009). At the end of 2007, the continent had over 117 billion barrels of proven oil reserves (with over 80% located in four countries: Algeria, Libya, Nigeria and Angola) and over 14.6 trillion cubic meters of proven gas reserves (Karekezi and Kithyoma, 2003; UNIDO, 2009). According to African Bank (2007), the largest natural gas deposits in Africa are located in Algeria and Mozambique, with other significant occurrences in Libya, Niger, Morocco, Nigeria, Rwanda, Ghana, Egypt, Tunisia and off the coasts of South Africa, Tanzania and Namibia. The continent is also rich in coal energy resources. The major deposits are found in Botswana, the Democratic Republic of Congo, Mozambique, Nigeria, South Africa and Zimbabwe; while minor deposits are found in Senegal, Benin, Niger, Somalia, Ethiopia, Tanzania, Zambia, Malawi, Madagascar, Egypt and Morocco (African Bank, 2007). The majority of Africa's coal resources are located in southern and western Africa and in 2005, it was estimated that the recoverable coal reserves in South Africa was about 34 billion tons, making South Africa the sixth-largest holder of coal reserves in the world (African Bank, 2007). In addition, Africa has considerable Uranium mineral deposits. The largest African uranium deposits are located in Namibia, Niger, Algeria, the Central African Republic, Gabon and South Africa (African Bank, 2007). However, the continent has only one nuclear power station (Koeberg, in Cape Town, South Africa), which supplies 3% of Africa's power needs (Mkhwanazi, 2003).

Despite all these remarkable electrical energy resources, most African countries are characterised by short supply of electrical power, a reflection of their low income and general state of economic underdevelopment. Without adequate supplies of affordable electricity, economic and social development cannot be achieved and hence poverty becomes inescapable. Although the status of electrical power sector in Africa varies considerably from one country to another, it shares common shortcomings which include (Mkhwanazi, 2003; Olumuyiwa and Mnse, 2008):

- Poor performance, resulting in poor quality of supply and service and an inability to meet growing electricity demand;
- Insufficient managerial and technical skills to do the job;
- Inability of the country's governments to fund expansion or refurbishment, or to attract private sector investment into the power sector;
- Lack of maintenance of existing facilities due to inadequate finance/technical leading to reliability problems;

- Inappropriate tariffs, often resulting from political interference, with tariffs below marginal costs;
- Poor governance or unstable governments due to regional and ethnic conflicts;
- Poor economic status of African states especially south of the Sahara;
- Inadequate revenue collection mechanisms, and therefore credit unworthy businesses and
- Inadequate rainfall which causes power rationing.

Due to these limitations, Africa has the lowest electrification rate of all the continents at 26% of households, meaning that as many as 547 million people are without electricity access (UNIDO, 2009). Only 51% of the urban population and 8% of the rural population has access to electricity (UNIDO, 2009). In 2009, the UNDP-WHO estimated that about 89% of the inhabitants of Sub-Saharan Africa live in rural areas without access to grid-powered electricity. It has also been reported that extending grid electricity to many rural villages in most African countries would not be economically viable in the near future and in some villages not practically possible due to low energy demands and sparsely population (Mwhihava and Mbise, 2003). There are little prospects that financial resources will become available and economic viability will encourage most of the governments in Africa to undertake electrification of the rural households in the foreseeable future. In fact, the privatisation policy in most African countries had slowed down the expansion of electricity distribution in rural areas as the decisions of the investors are normally made based on the return on capital rather than on geographical or political considerations. This suggests that the rural communities in most African countries will continue to live without ICTs for several decades; a situation that not only deteriorates the development process but also hinders the process of poverty alleviation. In this case, therefore, renewable energy, particularly solar electricity is seen as viable solution to the lack of reliable and affordable electrical energy problem in Africa.

### *2.2 Renewable Energy Sources for Electricity Generation*

Africa is endowed with substantial renewable energy resources. According to Word Bank (2009) renewable energy resources in Africa comprise solar power (thermal or solar electricity), wind power, biomass (wood, food crops, grassy and woody plants, residues from agriculture or forestry, and the organic component of municipal and industrial wastes), geothermal, ocean energy (thermal energy from the sun's heat and mechanical energy from the tides, underwater currents and waves) and hydropower. It is estimated that the region has 1.1 Gigawatts of hydropower capacity, 9000 Megawatt of geothermal potential and abundant biomass, solar and significant wind potential (Karekezi and Kithyoma (2003). With the exception of hydro-electrical power which is used in most Eastern and Southern Africa (excluding Mozambique and South Africa), other renewable energy resources have not been fully exploited, due to technical and financial barriers, limited policy interest in renewable technologies and low cost of oil and gas in the previous years (Karekezi and Kithyoma, 2003; NGS Group, 2008; Okafor and Joe-Uzuegbu, 2010). There are, however, prospects for the wide scale development and dissemination of technologies for electricity generation from renewable resources which is attributed to recent increase in oil prices, recurrent crisis in power utilities resulting in unprecedented power rationing and global environmental initiatives (Karekezi and Kithyoma, 2003). In spite of these motivations, the potential of many renewable resources for electricity generation remain unqualified, with the exception of solar energy.

Electricity from solar energy is obtained through stand-alone Photovoltaic (PV) system. A stand-alone solar system is a small autonomous energy station, powered by a PV module, that provides electricity for basic services such as lighting, radio, television, computer, internet facilities and operation of small appliances to rural households without grid electricity (Scheutzlich et al., 2001; Diessen, 2008). For a household or building with grid electricity, solar electricity acts as back-up electricity. Stand-alone solar system consists of a solar module which converts the solar radiation

into electricity; rechargeable battery which stores the generated energy for use in the night and during cloudy days; charge controller which controls the charging of the battery; an alternative current (AC) inverter to covert direct current (DC) to AC current, switches, interconnecting wires and PV mounting rack (Roberts, 1991). It may also include circuit breaker (to prevent the cabling from overloading) or a generator as a supplementary electricity provider. Depending on the income level, technical and product availability, stand-alone solar systems can be grouped into four major categories (Roberts, 1991):

- Small system $(\leq 20\,\mathrm{Wp})$ for lighting only,
- Medium sized system $(20 - 50\,\mathrm{Wp})$ for the basic energy needs like lighting the house, radio and a black and white TV or computer,
- Large system (double the size of the medium system) for lighting a large house and the use of a color TV and computer,
- Extra large system (≥ 100 Wp), but with additional of more appliances. This is perceived as more luxurious as it resembles grid electricity and any electrical appliance can be connected.

Stand-alone solar system for electricity generation normally depends directly on the availability of solar radiation as well as other meteorological parameters (primarily temperature and wind), which can affect the performance of the PV module. Africa as a continent has tremendous solar energy resources due to the proximity of most of its land mass to the equator (ranging from the most northerly point, Ras ben Sakka in Tunisia, 37°21' N, to the most southerly point, Cape Agulhas in South Africa, 34°51' S). Most parts of Africa get strong sunshine throughout the year, meaning that stand-alone solar systems can be used almost anywhere in the continent for providing affordable, safe and clean electricity to both rural and urban areas without adequate and unreliable grid electricity.

### 3. Solar Electricity in Africa

Although the principle of solar electricity generation (the photoelectric effect) was discovered by Becquerel in 1839, it remained largely a laboratory curiosity for about two decades due to very low conversion efficiency of solar cells (Hill, 1989; Parish, 2000). The real breakthrough came with the American's Vanguard I Satellite in 1958 (Parish, 2000). In developed countries, PV systems gained favour in 1970s after the energy crisis and was used for remote commercial power applications such as microwave stations, signal buoys, highway call boxes and railroad crossing signals (Dincer, 2000). In Africa, majority of stand-alone solar systems for rural areas electricity generation started in 1990s (Wamukonya, 2007) and are used for different applications. A review of experiences with stand-alone solar systems in developing countries has been given by Nieuwenhour et al. (2001) whilst Wamukonya (2007) presented the general view of solar electricity for African's development. The following are specific examples of impacts of solar electricity in various sectors in Africa.

### 3.1 Solar Electricity Impact on Education

Availability of quality education is believed to be a crucial factor in determining the economic well-being of both urban and rural areas because it equips people with the knowledge and means to compete in the global market (Kirubi et al., 2009). In Africa, this is even more critical in remote rural villages, where children have to compete in standardised national examinations for placement in secondary schools, universities, colleges and jobs with their counterparts in the urban areas where there are more available learning resources. In 2009, it was estimated that about 95% of rural sub-Saharan African school children attend schools from households without electricity (Nolens, 2010)

leaving them without power for lighting, computers, photocopiers, refrigeration and laboratory works. For many children, especially girls in rural areas, the lack of electricity translates into a missed opportunity to attend school because during daylight hours they are overloaded with basic tasks such as fetching water, firewood and fuel. This situation affects their capacity to undertake assignments or review their lessons. Furthermore, lack of electricity cuts children and teachers off from the free learning materials and makes nearly impossible for teachers to create meaningful materials for homework. A few hours of solar electricity to students in remote areas can result in major improvements in their academic performance. In 2006, Gustavsson carried out investigation on benefits of solar technology in education in un-electrified rural villages in Zambia. In this study, the author found that students from households with solar electricity spend more time on homework than students from households without solar electricity. Similar results have also been observed in Senegal (Jamie, 2010), Tanzania (Paul, 2010) and Morocco (Allali, 2011). While all these studies did not assess whether solar electricity result in improved academic performance, Gustavsson (2008), Kirubi et al. (2009) and Allali (2011) found that students from households with solar electricity tend to improve their grades more than their colleagues from non-solar electrified families. The authors argued that having an opportunity to see things they learn about in their textbooks and that do not exist in their rural region from watching TV helps them better understand their lessons.

In addition, solar electricity helps to retains teachers and urban teachers are more willing to relocate to rural villages that have solar electricity, especially if their accommodation has electricity (Allderdice and Rogers, 2000; DFID, 2002; UNDP, 2004; Gustavsson, 2007). Furthermore, solar electricity enables access to facilitate distance learning (DFID, 2002; UNDP, 2004). Kafumu (2000) argued that if rural development programmes could integrate solar electricity as an alternative service for the supply of electricity to dispersed remote rural populations, most children would have access to lighting in the evening to extend their studies. This would contribute to achieving the international goal (Millennium Development Goal 2) of ensuring that by 2015 all children (boys and girls) in Africa will be able to complete primary education. It should be noted that one of the reasons for primary school children drop-out in rural areas in Africa is lack of electricity as many children during day time are engaged in household, paid work or both and are not able to study during night time (Ndaruhutse et al., 2008).educational media, communications in schools and at home. Availability of power increases education opportunities and promotes engagement at all levels.

### 3.2 Solar Electricity Impact on Social and Economic

The use of solar electricity improves living standards and can promote economic development. The superior light from electric lamps by comparison with kerosene, wood sticks and candles is often described as the most notable quality of life improvement (Hansen and Martin, 1987, Hankins, 1993; Cabraal et al., 1996; Gustavsson and Ellegard, 2004; Wamukonya and Davis, 2001; Nieuwenhout et al., 2000; Jacobson 2004; Gustavsson, 2008; Paul, 2010). In additional, solar electricity provides entertainment because people have better access to communication and information through TV, radio and mobile phones (Malony, 2006). This also helps to reduce rural-urban migration as people move to the city for job and to gain access to other modern amenities associated to electricity (Van Campen et al., 2000).

As for the economic contribution, several studies have highlighted an important point for economic success of solar electricity in rural villages. For examples, Obeng and Evers ( 2009) found that solar-powered icemakers can assist village micro-enterprises in fishing, sale of ice cubes and cold drinks especially in tropical countries. Other businesses activities improved by the use of solar electricity include retail shops by extending their working hours after dark (Allderdice and Rogers, 2000; Van Campen et al., 2000), rural cinema/football game (TV/video-business), mobile phone battery charging shops, repair/technical shops, handicraft/sewing workshops, food stands and restaurants,

food processing and preservation, hairdressers and barbershops and local village bar/pubs (Van der Plas and Hankins, 1998; Obeng and Evers, 2009). For most of African countries rural lifestyles, these activities results in significant increase in family income. However, it should be noted that electrification cannot by itself ensure economic development. It is a necessary but insufficient condition. Electrification works best when overall conditions are right for rural income growth and when it is complemented by social and economic infrastructure development such as rural water supplies, health programmes, primary and secondary education, regional and feeder roads and the use of ICT technology.

### 3.3 Solar Electricity Impact on Communication

For many decades, radio has been a means of obtaining information and entertainment (music) in remote rural villages in Africa. However, radio provides a limited range of information and it is a one way means of communication (Aker and Mbiti, 2010). In recent years, televisions (TVs) have become available in some villages, although high cost and lack of grid electricity has been the major obstacle to their widespread in remote rural villages (Van Campen et al., 2000). The significant increases in mobile phones in the early 2000s in many rural villages in Africa have brought a new possibility in communication to the rural communities. At the end of 2009, there were about 400 million mobile phone subscribers in Africa, representing a penetration rate of over 40% (Anon, 2011). Of these, 65% are rural villager users and it has been estimated that by 2015 about 85% of all people in rural areas in Africa will have mobile phones (Anon, 2011). Increased access to telecommunication services through mobile phones has a direct impact on the socioeconomic development of rural society in Africa. For example, rural societies which had difficulties accessing medical services information due to poor road infrastructures, can now get that information through mobile phones. Rural societies with their backbone economy basing on agribusiness, can now enquire the price of their products from one point of sale to another and hence decide where to sell before travelling to the selling point. In addition, a rural society can now save some money and time to travel from one place to another in search of relatives and friends, by maintaining their social relationships by calling or writing text messages (Ngumbuke, 2010). It is also easy nowadays for people to send money to their children at schools or relatives in another town through mobile phone service, e.g., M-Pesa in Kenya and Tanzania and Zpesa and ZAP in Tanzania (IFC, 2010). However, a mobile phone needs to be charged every couple of days, depending on usage, and with the current situation of grid electricity in most remote villages in Africa, this represent a major challenge to the widespread of mobile phones in Africa. In most rural villages in Africa, mobiles phone batteries are generally charged by carrying them to a grid or diesel generator powered 'battery charging shop', where they are left overnight for charging. In a rural context, this process is costly and time consuming because the charging shops is very far (Jacobson, 2007) and expensive (GSMA Development Fund, 2010).

Providing inexpensive charging solution through the use of solar electricity increases mobile phone access and improve social and economic situation in the rural areas. To find out the relationship between solar electricity charging and mobile phone usage, Dicel in 2008 distributed about 350, 000 solar chargers in areas without grid electricity in Papau New Guinea, Vanautu, Haiti, Suriname and several other markets. Digicel then tracked the mobile phone usage of subscribers before and after acquiring a solar charger. It was found that solar charger extends service availability and could boost average revenues per user by 10–14% (GSMA Development Fund, 2010). In 2009, similar study was carried out by ToughStuff UK Company in rural villages (without electricity) in Madagascar and it was found that the provision of solar mobile charging can increase mobile phone usage by 0.5 to 1.5 minutes per day (GSMA Development Fund, 2010). This represents a significant increase in rural villages without electricity because mobile phones are normally switched off after taking a call or sending a text message so as to preserve charge of the mobile phone.

### 3.4 Solar Electricity Impact on Health

The provision of electricity to rural villages in developing countries can result in multiple benefits to the health of community members. For example, the replacement of wood sticks, kerosene lanterns and candles for lighting with solar electricity reduces indoor air pollution, which affects the health and wellbeing of rural families. The World Bank has classified indoor air pollution in developing countries among the four most critical health problems. For example, in the surveys conducted by India Tata Energy Research Institute, about 40% of people reported eye irritation, coughing and nasal problem associated with the use of kerosene lamps (Smith, 1987). Indoor air smoke contributes to respiratory infections that account for up to 20% of the 11 million deaths in children each year (Obeng and Evers, 2009). In additional to emitting pollutants with known respiratory impacts, kerosene lamps are fire hazard. A substantial number of children reportedly die of accidental kerosene poisoning every year (Kaufman, 2000). Solar powered refrigerators also play a very significant role in remote rural clinics, where medicines have to be stored for vaccination and the treatment of diseases at the village level (Van Campen et al., 2000). Electric lighting greatly improves accessibility and quality of emergency care at night. Women in labour need clean light to have safe child delivery at any time. In a rural clinic where there is no electricity, women deliver under very uncomfortable conditions due to the lack of essential equipment, medical facilities and poor visibility after sunset. Furthermore, radio communication can greatly improve rural health care services, by providing full-time communication with medical back-up staff. Recently experiments have been done with remote access to medical databases by internet connection, providing a valuable knowledge source for rural medical personnel (Van Campen et al., 2000). In most instances solar electricity is the only or most cost-effective energy source for these applications. Other medical appliances that can be run on solar electricity are nebulizers, centrifuges, sterilization and water treatment equipment (Van Campen et al., 2000). Moreover, un-electrified remote rural communities have notorious difficulty to recruit and keep trained medical staff. Stand-alone systems providing electricity for: light, music, TV and communication, and these are important incentives for professional staff, who would otherwise opt to work in grid-connected towns and cities (Van Campen et al., 2000; Obeng and Evers, 2009).

### 3.5 Solar Electricity Impact on Agricultural

According to the United Nations Food and Agriculture Organization, UNFAO (2000), sub-Saharan Africa is the part of the world with the least food security. The UNFAO (2009) estimated that more than one billion of the world's people faced hunger in year (2008), around two hundred sixty-five million of them live south of the Sahara Desert. Lack of rainfall is one of their main causes of food shortages as most people rely on rain-fed agriculture for production of staple crops, which is limited to a 3–6 month rainy season. Solar electricity powered irrigation systems can significantly helps to sustain the conditions under which agriculture can contribute to food security, income generation and poverty reduction. For example, the study in Benin found that solar-powered pumps are effective in supplying water that increases crop production, especially during the long dry season (Burneya et al., 2010). In addition, solar electricity can be used in livestock watering (Van Campen et al., 2000). Furthermore, the study of Mahmoud and Natherb (2003) proved that solar-battery systems can be used efficiently for water pumping and its cost is much less than that using diesel systems. Similarly results has been observed by Odeh et al., (2006) and Qoaider and Steinbrecht (2010).

### 3.6 Solar Electricity Impact on Environment

Although electricity is a modern-day necessity, power production methods that rely on fossil fuels cause harm to environment. The environmental benefits of PV are among the most compelling

reasons for widespread adoption. Use of stand-alone systems reduces greenhouse gas emissions and regional and local pollution, because solar electricity generation is entirely non-emitting, utilising a clean and renewable resource. Additionally, land use requirements and impacts are relatively benign, especially for rooftop PV, which utilises existing building space and requires little to no additional land (Paul, 2011). Furthermore, solar electricity reduces the need for dry-battery disposal (Scheutzlich et al., 2001). Small dry-cell batteries for flashlights and radios are used throughout the un-electrified world. Most of these batteries are disposable lead-acid cells which are not recycled. Lead from disposed dry-cells leaches into the ground, contaminating the soil and water. Solar rural electrification dramatically decreases the need for disposable dry-cell batteries. The use of solar electricity also helps to protect forest areas and buffer zones for ecosystem preservation (Chel et al., 2009).

## 4.    Development of Solar Electricity for ICT Applications in Africa

Most of the ICT devices needed in African countries such as mail servers, web servers, routers, switches, computers, printers and base stations requires little amount of electrical power supplier and therefore solar electricity will be a suitable and cheaper electricity alternative. However, solar electricity in most African countries has not been in practice as much as it should have been due to lack of qualified solar engineers and technicians as well as high initial cost of the technology (Derrick, 2000; Kassenga, 2008). Lack of qualified solar engineers and technicians in Africa is associated with the attitudes toward solar electricity technology (Derrick, 2000; Söker, 2007). The arguments such as 'it does not work', 'the technology is too complicated', 'it is not appropriate', 'I don't know about the technology' etc are used against solar electricity to indicate lack of acceptability. This lack of acceptability is attributed to a great extent by poor system reliability which is due to lack of qualified solar engineers and technicians, particularly in remote areas (Van der Plas and Hankins, 1998; Mulugetta et al., 2000; Gustavsson, 2004; Nieuwenhout et al., 2004). Technical failures of solar electrical systems often lead to high cost for users, disappointment with the solar electricity and a strong negative thinking about and attitude to  solar electricity technology. If solar electricity has to make important impact on the ICT development, preventing avoidable technical problems has to be one of the main challenges to overcome. This can be done if efforts are devoted in training skillfully qualified solar electrical engineers and technicians in both urban and rural areas who will be able to design, install and provide timely system maintenance and ensure that solar system designs are appropriate to the local conditions.

Furthermore, solar electricity in most Africa countries has been limited with the inability of the households to afford the technology cost (Gustavsson et al., 2004; Karekezi and Kithyoma, 2004; Wamukonya, 2007). Foster et al. (2010) pointed out that one of the most important advances of the past century in developed nations was the development of consumer credit. This allowed the citizens to have widespread ownership of homes, automobiles and appliances that the average person could not afford to purchase direct. Unfortunately, commercial banks and vendors rarely finance the purchase of solar electricity to people living in rural areas of developing countries and, if they do, at very high interest rates (Mapako, 2001). In most non-electrified rural areas, many stand-alone solar systems could be installed if financing was readily available to households. However, in most of the African countries there are no financing mechanisms for rural communities (TASEA, 2005). The reason is that many local solar energy components distributors are family owned low-capital entrepreneurial companies that cannot afford to offer end-user financial credit, thus only allowing them to make cash sales. Since stand-alone solar system can be built in phases, we recommend the use of 'modularity approach' for low income families. Modularity approach is the method of adding components (particularly the PV modules and storage batteries) to the existing stand-alone system depending on financial availability. It may also include a process of purchasing

one component at a time, depending on financial availability, until the whole system is complete. This has not been done in the past due to lack of basic knowledge in solar electricity as most people regards stand-alone solar system as a 'generator' where everything should be purchased at once and its electrical capacity cannot be altered.

We also recommend two more strategies: the amendment in curriculums in primary schools, secondary schools, colleges and universities to include renewable technology courses (particularly solar energy) and the co-operation of various solar energy stakeholders. These are discussed in details in sections 5 and 6, respectively.

## 5. Solar Energy Education Schemes in the Curriculum for Schools, Colleges and Universities in Africa

As pointed out previously, renewable energy, in particular solar electricity has an important role to play in transforming the lifestyle of poor people in Africa. However, with few exception successful cases of the adoption of renewable energy technologies, most of these resources have not been utilized. Kandpal and Garg (1998) pointed out that, while the failures may be attributed to a variety of reasons, one of the inhibiting factors is the lack of renewable energy education, to all the people, at all levels, and through all possible modes of education. In order for solar electricity to be effective, training in the field of solar energy, aiming at sensitising specialists and the general public to the possible uses of solar energy, must be ensured along four distinct axes: researchers, decision makers (engineers, economists, administrators, etc.), local maintenance technicians and users (Benchikh, 2004). In realising this, a survey was conducted by the Energy Research Institute of King Abdulaziz City for Science and Technology to find out the extent to which solar energy concepts used at different education level, the course structure/subject contents and the availability and types of teaching resource materials on a global level (Hasnain et al., 1998). The survey included nine African countries (Algeria, Botswana, Egypt, Ghana, Libya, Nigeria, Tunisia, Sudan and Zimbabwe), 21 developing courtiers and 30 industrialized countries. The major findings of the survey were: (i) only three universities in industrialised countries are conducting Master degree course on solar energy/renewable (ii) Some universities in industrialised countries inducted subjects relevant to solar energy/renewable in their curriculum at university level while very few topics on solar energy/renewable (as elective course) are available in institutes for undergraduate and postgraduate programs in developing countries (iii) In developing countries, Indian Institute of Technology (New Delhi), is the only organisation, conducting a postgraduate program in energy engineering. This institute is also offering a Master of Technology Program in energy studies. While we acknowledges that the African countries selected in Hasnain et al. (1998) study is not a good representative for the whole continent, the study pointed out a very important picture about the situation of solar education in Africa. It is likely that in most African countries education curricula do not include solar energy courses. Indeed, Gope et al. (1997) have reported that education systems in most African countries have been designed along traditional models based on established non-renewable energy sources and do not include solar energy. The reason for this situation is due to non-recognition of renewable energy sources as a major component of the energy source (Benchikh, 2001).

We here recommend that, if solar energy has to bring success in Africa especially in electricity generation for ICT application, courses/subjects related to renewable, specifically solar energy, have to be introduced in the current curriculum at every level of education. The content of courses/subjects should vary with the age of the student from primary to university level. For example, because of their ages, the content of the subject for primary school should be based on development of awareness among students about various types of non-renewable and renewable energy sources, particularly the potential of solar energy (electricity) in Africa, present energy crisis, environmental pollution and climate changes. On the other hand, the content of solar energy

courses for secondary schools should be based on concept of quantity analysis where the aims, amongst others, are to measure, calculate, design and analyse to enable the students to appreciate the consequences of various energy-related impacts to the society. At university level, renewable/solar energy courses should take into consideration the latest developments in renewable energy sector and therefore they must strengthen the competence and the technical ability of the recipient in such a way as to produce a technical staff of high quality in judgment and decision-making, necessary for the planning and management of projects, and able to find the most appropriate application and utilization formula for their local country conditions (Benchikh, 2001). In other developing countries, some efforts have been made to provide renewable energy education and training as detailed in Garg and Kandpal (1993a, 1993b, 1995, 1996) and Kandpal and Garg (1994).

We also recommend that renewable/solar energy education should be extended to the general public, specifically the policy makers, member of parliaments, ward executives officers and various stake holders. The contents of courses to these groups should include, among others, awareness about possibilities and prospects of solar technologies, the present energy crisis, etc. This knowledge can be gained through organization of seminars, workshops, publication in various energy journals and production of audio-visual materials illustrating existing solar installations and the future prospects for its technologies.

## 6.     The Role of Co-operation in Solar Electricity Development

Despite the fact that the cost of the PV panels has become significantly less expensive over the past decade (IEA, 2010), the initial upfront cost of stand-alone systems remains expensive for most people in Africa who are living on less than US$1 per day. As a result, most rural solar electricity projects have been funded either by African governments, domestic financing institutions or international organisations. Funding programs are seen as a driving force in rural solar electricity projects due to the fact that it is difficult for rural electrification projects to be accomplished by profit companies as there are no immediately returns. These investments takes many forms including financial incentives from government; loans and capital investment from banks, private investors, business enterprise capital funds and communities as well as in terms of expertise. Over the past two decades, African governments/and various international organisations have supported rural solar electricity programs in different African countries. Some of these projects include:
- Zimbabwe Global Environment Facility (GEF) PV solar project for uplifting rural living standards and addressing the problem of global warming; funded by GEF, UNDP and the government of Zimbabwe (Mapako and Afrane-Okese, 2002),
- South Africa Solar Some Systems (SHSs) and clinic solar electrification project; funded by US Department of Energy, Solar Electric Light Fund and South Africa government (Ratterman et al., 2008).
- Lesotho Health Center Electrification Solar/Diesel Hybrid project in Lesotho, funded by Solar Electric Light Fund (Ratterman et al., 2008).
- Morocco PV rural electrification program; funded by German-Moroccan financial cooperation through KfW Developmental Bank (UNDP, 2011).
- Kenya Solar Electric Equipment Project; supported by Energy Sector Management Assistance Programme, ESMAP, (World Bank, 2000a).
- Solar Market Development in Comoros Project; funded by ESMAP (World Bank, 2000b).
- The Gambia hospitals (Sulayman Junkung General Hospital, Somita Community Clinic Hospital) solar electrification projects; financed by Power Up Gambia, a non-profit organisation (Power Up Gambia, 2009; 2010).

- Solar electricity (Umeme Jua) project in Tanzania; fund by UNDP and the government of Tanzania (FEF, 2007).
- Unleashing Entrepreneurial solar energy projects in Tanzania, Uganda, Zambia and Mali; funded by the Department for International Development (DFID), UK (FEF, 2007).
- Kigali Solaire grid-linked solar electricity project in Rwanda; funded by Deutsche Gesellschaft für Technische Zusammenarbeit GmbH (GTZ), German (GTZ, 2007).
- 1kW solar electricity project for rural villages in Rwanda; funded by GTZ, Germany (GTZ, 2007).
- The St Peter Hospital and St Thomas Clinic solar electricity project in Ghana; funded jointly by Sindicatum Climate Change Foundation (Ghana) and Environmental Change Institute, Oxford (UK) (Wheelhouse and Toit, 2009).

For more rural solar electricity funded projects in Africa and different developing countries, see Martinot et al. (2001), Scheutzlich et al. (2001), the IBRD (2004) and the ARE (2011). All funded projects in Africa and other developing countries have been regarded as successful projects, demonstrating the importance of financial investments to the widespread applications of solar electricity in rural communities. There are many potential benefits arising from the availability of any form of funding. For instance even those who cannot afford to purchase the solar system can have access to solar electricity that helps to improve their health, education and productivity. For significant penetration of solar electricity in rural areas, which will in turn encourage the applications of ICT, we therefore recommend the following:

- African governments should put policies and programs in place that will maximise private, community and public investment in rural solar electricity. These policies should be part of a politically-supported, comprehensive strategy which includes targets and milestones, financial incentives, new funding sources, regulations, and training.
- The African governments should support policies that encourage community investment in stand-alone solar systems including community finance funds and training.
- Each African government should play a leadership and enabling role to increase investment in and financing of rural solar electricity and play an active international role in support of a global transition to renewable energy by participating in and supporting international initiatives and finance forums.
- All African leaders must have a strong political commitment to solar electricity and ICT so that the two technologies should be one of the top priorities/objectives in Africa at both regional and sub-regional integration groups such as the Arab Maghreb Union (AMU), the Community of Sahel–Saharan States (CEN-SAD), the Common Market for Eastern and Southern Africa (COMESA), the Economic Community of Central African States (ECCAS), the Economic Community of West African States (ECOWAS), the Inter-Governmental Authority on Development (IGAD), the Southern African Development Community (SADC), the Central African Economic and Monetary Community (CEMAC), the Economic Community of the Great Lake Countries (CEPGL), the East African Community (EAC), the Indian Ocean Commission (IOC), the Mano River Union (MRU) and the West African Economic and Monetary Union (UEMOA).

## 7. Conclusions

Electrical energy is an obligatory input in the process of economic, social, technology and industrial development of any society. For the technology, particularly ICTs, it is impossible to operate any form of ICTs in remote locations without electricity or in urban areas without adequate and reliable grid electricity. In this paper we have shown that in developed countries where ICT has been applied extensively; ICTs offer increased opportunities for sustainable economic development and plays a

critical role in rapid economic growth, productive capacity improvements, education, government, agriculture and international competitiveness enhancement. However, the impact of ICTs in most African countries has yet to be seen. We report on some of the problems facing African countries (economic decline, energy crisis, insufficient capital resources, lack of availability and investment in technology, insufficient food supplies and serious draught), all of which can be tackled if education is promoted with access to and use of ICTs made possible for the people in the public, private and voluntary sectors. However, it has also been shown that most of the African countries are characterized by short supply of electrical power, a reflection of their low income and general state of economic underdevelopment. In rural areas, only 8% of the rural population has access to electricity and it has been found that extending grid electricity to many rural villages in most African countries would not be economically viable in the near future. In some villages this may not be practically possible due to low energy demands and sparse population. As most ICT devices use and require regular supply of electricity, the rural communities in most African countries will continue to live without ICTs for several decades; a situation that not only negatively affect the development process but also hinders the process of poverty alleviation. In this context, therefore, we have highlighted the use of solar electricity as one of the solutions. However, some constraints must be addressed properly before its effect can be clearly seen. This paper has pointed out a number of suggestions on how solar power generation can be developed. These include training qualified solar engineers and technicians, establishing PV markets and business modes, introduction of renewable (solar) energy education in schools and universities, political leaders appreciation of solar electricity as one of the major energy component, lowering initial cost of the PV technology, making available, finance mechanisms for rural communities, import tax exemption and regarding electricity as one of the basic needs like food, shelter and cloth.

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# "THEY SAY THAT WE ARE PRONE TO VIOLENCE, BUT IT'S HOME SWEET HOME": THE PRAXIS OF HIP HOP, SELF-ACTUALIZATION, AND DEMOCRATIC EDUCATION FOR ADDRESSING THE ROOTS OF VIOLENCE

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**Abstract**

The unmet need for recognition is at the root of human aggression and violence. Each person has a basic need for food, clothing, and shelter. We also have a personal need for respect and regard, and to reach our potential. For marginalized communities of low-income urban youth of all colors, normal actions taken to meet such needs can become difficult. Efforts are stymied or blocked by society and individuals in the form of injustice and prejudice, as well as discrimination through social, economic, and political isolation. Having these needs unmet, leads to feelings of frustration, powerlessness, hopelessness, and eventually to apathy--the stage before violence. Thus, violence per se is not our problem, normalcy and indifference are. Situations which enable true human regard and respect will reduce the tendency to meet these needs in ways having anti-social consequences. Such genuine situations are characterized by actions toward meeting psychological-social needs through personal and cultural clarification, and self-actualization. The use of pedagogies of recognition and democratic education in our urban public schools, appreciating global Hip Hop culture via validating youths' search for authenticity, and an urban community enabling the uniqueness, self-determination, and human potential of each and every citizen are recommended.

## 1. Introduction

"At the heart of violence lies the wish to show ourselves men with a will. But the complexity of society makes the man lose heart. Nothing he does any longer seems a skill to be proud of in a world where others get the headlines. This is a plausible picture, in despair of which men cheerfully join any private army offering the ambivalent identity of a uniform: the right to salute and be saluted." ~ Jacob Bronowski, The Face of Violence

"How a society channels male aggression is one of the greatest questions as to whether that society will survive. That's why I am not against violence in the media; I am against the glorification of immoral violence." ~ Dennis Prager, author.

"It is better to be violent, if there is violence in our hearts, than to put on the cloak of non-violence to cover impotence." ~ Mahatma Gandhi

## 2. Framing the Problem as a Need for a New Kind of Urban Education

It is tragic to have to say that there is no need to try to prove urban public education in America is in trouble. We only have to look at local television to see the negative outcomes associated with urban school failure. We also know that when urban students are graduated on time ready for careers, college and citizenship, chances of being involved in crime or violence are reduced.

The latest Schott Foundation report "The Urgency of Now" [1] alone reflects the echo of the constant debates on the issue. Oddly, the report presents a term, "The pushout crisis." Evidently, nearly 17% of African American students and 7% of Latin@ students were suspended at least once in 2009-10, compared to 5% for White students. The section of the report concludes that

disproportionate use of out-of-school suspension for Black and Latin@ children at all levels is the first step toward pushing them out. Thus, the definition of a "pushout" is a student who leaves their school before graduation, through the encouragement of the school itself.

The pushout crisis has led to situations where many schools are trying to get rid of (dump or "counsel" out) students who may tarnish the schools' statistics by failing to graduate on time [2].

Pushing students out is especially the case for urban charter schools which are under intense pressure to perform. These schools "spin" the pushout phenomenon as one where the student and their family "self-select out" [3] and so the school is left free of responsibility: We did not push the child out, they "self-opted" out. Thus, the challenge is not only trying to convince urban students to stay in school, but trying to keep urban school officials from pushing students out. Dealing with the "pushout" issue is going to take a whole new and proactive approach.

## 3. Pedagogies of Recognition as the Basis of a New Urban Education Where Educators Name, Know, Respect, and Celebrate Students

Perhaps these "pushed out" students, who may have been particularly subjected to years of social, cultural, political, and intellectual alienation, are ready for a new kind of pedagogical experience in their schools.

This is what educator Louie F. Rodriguez [4] asserts. He bases his new schooling on Max Van Manen's concept of "Pedagogy of Recognition" which are relational, curricular, contextualizing, pedagogical, and transformative. He explains these as relationally driven pedagogies because they foster identity formation while raising the existentially necessary critical consciousness of urban students.

Rodriquez wants to "problematize" the concept of recognition, particularly for urban youth, and introduce a new urban education around pedagogy which will help schools to understand, examine, and "help rectify" the social, political, and economic conditions that plague marginalized communities of low-income youth.

Perhaps due to his minority status, Rodriguez knows urban public schooling is inherently a socio-political actuality, and so urban teachers must foster the academic, cultural, and especially the political development of youth. In this way, he "reweaves" the ways urban schools conceptualize their understanding of youth in low-income schools.

"Thanks to our pedagogical responsibility and influence, we have the power to recognize; a power that has been given to us by the child and that can be observed when the transformational effect of recognition occurs." ~ Max Van Manen

Dr. Rodriquez also knows that equal attention must also be placed on questioning the institutional power structures that legitimize or deny recognition. Negative recognition, or denying a person's or group's existence, he sees as counterproductive and it typically continues to perpetuate the distrust urban students and families have regarding public urban school systems [4].

## 3.1 Understanding the Function and Significance of Recognition through an Introduction to the Various Pedagogies of Recognition

Reviews of Abraham Maslow's Hierarchy of Human Needs [5] and Rollo May's five levels of power which exist as a potential in each person [6] show a common link regarding the function and significance given to the human need for recognition, and acts of self-affirmation and assertion used to develop self-respect, and gain and keep the regard of others.

**3.1.1 Maslow's Hierarchy of human needs.**

"We use violence to show our love."

~ A remark by a Cape Town, South Africa youth stated to researcher Monique Barling as to how violence is used to solve minor conflicts or acts of retribution in their community.

According to Abraham Maslow [5], we human beings have fundamental needs which motivate our behaviors. These needs are:

- Biological--hunger, thirst, sleep
- Safety--security, protection
- Social--sense of belonging, love
- Esteem--self-esteem, recognition, status
- Self-Actualization--the need to fulfill our innate potential

**3.1.2 Self-Actualization.** Self-actualization is the need of humans to make the most of their unique abilities and to strive to fulfill their essence. Maslow [5] describes self-actualization as follows: Self-actualization is the intrinsic growth of what is already in the organism, or more accurately, of what the organism is.

"What we can be, we must be. We must be true to our own nature. This need we may call self-actualization." ~ Kurt Goldstein

For Maslow, self-actualized people are moral, creative, spontaneous, problem solvers, lack prejudice, and embrace facts [5].

"The final aim is not to know, but to be. There never was a more risky motto than: Know thyself. You've got to know yourself as far as possible; yet, not for the sake of knowing. You've got to know yourself so that you can at least be yourself. 'Be yourself' is the last motto." ~ D. H. Lawrence, Fantasia of the Unconscious

**3.1.3 May's Levels of Power.** Dr. Rollo May sees five levels of potential power in each of us [6]:

1. The infant's *power to be*. Power is given in the act of birth and the sheer fact the infant lives. The newborn infant crying, violently waving arms as signs of discomfort, demanding hunger or other needs be met, must be able to find their power and use it. To exist is to be powerful.

2. *Self-affirmation*, the ability to survive with self-esteem. Besides the need to be, we have to affirm our own being. Survival is not enough, but survival with some esteem--a sense of significance and fulfillment that is innately self-satisfying and appreciated by others. Since humans are self-conscious, the question of significance emerges, and the long and crucially important quest for self-esteem or its substitute is continuous. The cry for recognition becomes the central cry in this need for self-affirmation.

"I don't say he's a great man, he never made a lot of money. His name was never in the paper. He's not the finest character that ever lived. But he's a human being, and a terrible thing is happening to him. So attention must be paid. He's not to be allowed to fall in his grave like an old dog. Attention, attention must finally be paid to such a person." ~ Arthur Miller, Death of a Salesman

3. *Self-assertion*, which develops when self-affirmation is blocked. When assertion meets resistance we make greater effort to make clear who we are, what we want and believe. It is now against opposition. This is drawing a line in the sand--a stronger form of behavior more overt than self-affirmation. We make it unavoidable that the others see us as we cry: "Here I am; I demand that you notice me!"

4. *Aggression* is a reaction to thwarted self-assertion. In contrast, this is crossing "the line in the sand" because our assertion(s) for recognition and other needs are ignored. A natural drive (impulse, tendency, or action) is a potential in humans. The aggressive response is a part of our nature which may be called to meet our needs, both primary (food, shelter, safety) and secondary (recognition, affiliation). Aggression occurs because the opposition to affirmation and assertion is so entrenched, and the apathy and inertia this has created in the ignored person or group are so strong that greater force is necessary.

Although the term "aggression" has a well deserved negative connotation, we still do not want to see anti-violence programs misjudge the healthy place of aggression in individual or societal development [7].

"In the Utopian aim of removing all power and aggression from human behavior, we run the risk of removing self-assertion, self-affirmation, and even the power to be. If it were successful, it would breed a race of docile, passive eunuchs and would lay the groundwork for an explosion in violence that would dwarf all those that have occurred so far. We can't deny the essence of ourselves: the self-affirmation and self- assertion making us persons and without which we have no reason for living. What we have failed to see is that aggression has been, on the positive side, in the service of those values of life that would if discarded, leave us bereft indeed." ~ Rollo May, Power and Innocence

5. Violence, a response to situations where the individual or group feels all other ways of reacting are blocked off. Efforts to obtain recognition are ignored and/or aggressively resisted by others. It occurs when reason and persuasion are ineffective. Thus, violence is largely physical: the cerebrum being bypassed, the stimulus transmitted from the environment is translated directly into the violent impulse to strike.

"Violence is, essentially, a confession of ultimate inarticulateness."  ~ Time Magazine

"Violence is as American as cherry pie."    ~ H. Rap Brown

"In violence we forget who we."   ~ Mary McCarthy

### 3.2 The Pedagogies of Recognition

Below are the five pedagogies of recognition Rodriquez [4] suggests educators use to become "transformative mentors" who surround, inspire, and support youth so that they can enact their own agency as people.

Relational recognition involves the ways in which urban youth are viewed, named (labeled), greeted, and acknowledged within the school context. It asks teachers to question: In what ways do I know, relate to, and respect my students?

Rodriquez points out the influence zero-tolerance policies, and other "climates of accountability" such as high stakes standardized testing [8] actually "thwart" the authentic student–adult relationships schools need to gain the trust and hope of urban students. Yet, authentic relationships with students, Rodriquez writes, can influence engagement and achievement only if teachers "…are willing to enact the simple yet critical gestures of acknowledgement." Extending these basic human "courtesies" are so very important to "urban youth in urban public schools where their disposition is not perceived as the norm as success by assimilation" and not cultural empowerment and self-actualization.

Curricular recognition considers the ways in which the knowledge and experiences of urban youth are affirmed, validated, and legitimized within the school context. It challenges teachers to ask themselves: "In what ways does the curriculum reflect the lived realties of the youth I serve?

Here Rodriquez [4] has a basic insight to share: We should assume that urban youth are ready to engage in rich intellectual activities, particularly when the content is directly relevant to their lives.

And why has this type of "engagement" not happened? The typical White middle-class culture of schools subtracts from the curriculum the realities which all urban youth face in their neighborhoods. Also, what is presented to students as curriculum is actually in many ways a complex and politicized tool that has been used historically to exclude and marginalize urban youth in public urban schools.

Basically then, what Rodriquez points to is that urban youth are quite smart and hip, particularly they have the "street smarts" needed for their very survival. So, historically they bring a complex set of skills for analyzing, theorizing, and predicting realities not only in their neighborhoods, but in America. The issue for Rodriquez is: policies and practices of the institute of public education often fail to legitimize students' knowledge and experiences--their existential realities.

*Contextualizing recognition* urges educators to connect urban students' dispositions and lack of engagement from school to the social-historical context for the purposes of transgressing the dominant paradigms that students experience today (i.e., school–community disconnection).

When educators "contextualize" recognition, they must consider the ways in which urban youth are recognized within their social context as a means of understanding their existential experiences in school and beyond. Here a teacher must ask: In what ways does the social context help me understand the lives and schooling experiences of the students I serve?

Rodriquez [4] explains it this way: urban youth come to school with experience which require a degree of skill and knowledge that is rarely validated in the school context because it may not be considered "official" curriculum.

In many instances, he claims these urban skills and experiences are needed for purposes of handling or overcoming the status quo (the historical school-community disconnect or social justice issues). Contextualizing will help teachers see these coping behaviors not as negative, but as a way urban communities can used as "a catalyst for change" [9].

*Pedagogical recognition* happens when teachers' lessons stem from and are shaped by students' experiences in schools, the values they place on particular knowledge and experiences, and how these experiences and life lessons interact within the larger social context in which they live. A teacher using this approach to pedagogy asks: In what ways does power influence the learning and relational environment of the classroom?

Rodriquez [4] notes that educators must assume urban youth of all colors want to talk about their experiences. Legitimizing the knowledge and experiences of urban youth may disrupt and transform the social relations of power typically found in schools and society. Here educators can work toward a consciousness-raising: conscientization [10]. Students will realize their position in the world and fight for social justice.

This begs the question: since urban schools are uniquely situated to understand the effects of poverty and other social toxins on the lives and school performance of urban students, why not have these schools' curriculum formed around the study of and eventual eradication of these toxins? Now the purpose of urban schools is not to get students out of poverty, but to get rid of poverty [11].

Finally, *transformative recognition* is a constant process where questions are forged about the purpose of recognition and education. In this situation teachers must question: In what ways do all aspects of the educational endeavor live up to principles of justice, transformation, and freedom?

As an example, Rodriguez [4] points out that transformative recognition will encourage educators to constantly question the purposes and goals of their policies, processes, practices, and curriculum: education for whom, for what purpose, for what social order? Transformation challenges teachers to examine how public urban education coincides with larger community goals for social change and liberation. When this happens, Rodriquez asserts that justice-seeking projects will become central to the educational process as "…a way to better serve our youth and forge hope in impoverished communities."

The very practicality and direct relevance of these methods of recognition is why Rodriquez [4] believes urban students (and their families) who have experienced years of social, cultural, political, and intellectual alienation, may be ready for a new kind of pedagogical experience in urban schools.

## 4. Other Pedagogies of Recognition

Two more pedagogies of recognition, self actualizing and global youth culture, must be added to the previous five pedagogies.

### 4.1 Self-Actualizing Recognition as a Way to Enable the Full Potential of Each Student

A pedagogy of recognition regarding self-actualization is a process where schools are set up to enable the full potential of each student. This approach recognizes the influence of the "one-size-fits-all" concept of normalcy and counters the hegemony of the myth of "average" with a pedagogy based on finding and developing the uniqueness of each student.

### 4.1.1 One-Size-Fits-All or "Normalcy" as the Source of Problems in Society [12].

"If such a thing as a psycho-analysis of today's prototypical culture were possible, such an investigation would show the sickness proper to the time to consist precisely in normality. ~ Theodore Adorno, Minima Moralia

At the 2006 (14th) International Democratic Education Conference [13] in Sydney, Australia, Yaacov Hecht of the Institute for Democratic Education (IDE) argued that the source of problems in society is the one-size-fits-all "square" we all must fit into. This is reinforced by schools where we are told, if you want to learn, you have to come inside the square. We judge everyone by the square. We are asked, "Why are you outside of the square?" This, he said, is the danger of school.

The role of standardized tests Hecht [12] says is to keep us in the square. He predicted an era of global testing would arise to promote world standards. He sees this as no more than the creation of a culture of competition, power, and money: a "Coca Cola" culture which turns individual cultures into one global culture.

In traditional approaches to standardized testing, learning disabilities are dismissed and every grade level has a fixed standard of achievement. In democratic self-managed learning approaches, testing is not standardized, thus unique learning abilities are recognized and each person has unique areas of strengths and development [12].

### 4.1.2 Using Democratic Education to Enable Self-Actualization. Using Maslow's hierarchy of needs, Hecht [13] noted that presently only around 20% of the population self-actualizes, yet everyone can

be excellent, especially if we let a child in school choose the area they wish to develop. These are the questions we ask our children to encourage self-actualization:

- What is your uniqueness?
- What do you bring?

"A democratic culture guards the equal right of every person for self-actualization." ~ Yaacov Hecht

To have a democratic culture we must [13]:

- Recognize the fact of "the different"-- difference is beautiful.
- Accept the fact that we do not own the truth.
- Recognize that "the different" is also a part of the status quo.
- Recognize the importance of self-criticism as a constructive tool for growth.
- Disburse democratic education outside school borders--to businesses, government agencies, social/community, and civic organizations.

According to Hecht, the current problem regarding sustainability is that we do not know how to deal with difference, but why?

- We only see ourselves.
- We only see the world from our perspective.
- We want everyone to be like us.
- We want to expand ourselves, and our point of view everywhere.

Thus, the goal of education for sustainability must be to reduce negative aggression and violence by:

- A democratic school culture fostering closer relationships between adults and children.
- Looking for the uniqueness of every child.
- Providing a place for it to develop.
- Bringing this to the attention of the community and celebrating.

This is an opportunity to move from a society based on democratic procedures to one fostering a democratic culture. This ethos of principles gives each person a right to know and express their uniqueness, and so a way each can become capable of the following:

- Recognizing the uniqueness of every other member of society.
- Understanding that difference and/or uniqueness do not pose a threat, but are rather an opportunity for the individual and the community as a whole.
- Understanding the importance of supporting others in their quest to find uniqueness.
- Recognizing that the integration of differences guarantees a world that chooses construction over destruction [13].

*The challenge for urban public school districts is to bring about legislation that enables the creation of a fluid educational system where difference is a "taken for granted" attribute of every child who enters a public school classroom.*

**4.1.3 An Education City Enables Diversity, Excellence, and Self-Actualization** [13]. An "Education City" is a city where citizens choose to position education at the head of their priorities. In such a city, education is not what happens during certain hours and in certain places, it is the essence of the city itself. The vision of a "culture of learning" is driven by the belief that individual development and self-fulfillment through education improves the general quality of life for everyone.

**4.1.4 Pluralistic Learning** [13]. Yaacov also suggests "pluralistic learning," a type of education which acknowledges uniqueness: each person is different with both weak and strong attributes, talents, and abilities.

"Democratic education is self-managed learning." ~ Yaacov Hecht

**4.1.5 Excellence Centers in an Education City** [13]. An Education City would manifest through collaboration among community, government, and education organizations which would promote "Excellence Centers" outside of school representing a variety of intelligences, interests, occupations/careers, etc. Here, urban students could see what they are passionate about learning and doing. They could begin intense personal study and/or find adults who have the skills, interests, or careers they desire. The city could provide adults storefronts, places in strip malls or studios for individuals to pursue their passions. Here, adults could develop and/or share their own interests with the community and the world. This would be the first of many steps a community takes to support and develop the personal passion(s), uniqueness, and self-actualization of its citizens.

**4.2 Hip Hop Cultural Recognition through Using Self-Actualization and Hip Hop's "Keepin' It Real"**

It is no coincidence that the concept of self-actualization Yaacov Hecht supports for a sustainable society is also the essence and "promise" of today's global youth culture. To understand the potential of self-actualization as the mission and goal of public education, we are challenged to examine and discuss the repression of Black identity within these same urban school settings and larger society.

To do this, we must first examine the culture of identity of the Black adolescent male as reflected within and influenced by Hip Hop culture.

"I failed your class 'cause I ain't with your reasoning. You're tryin' to make me you." ~ Boogie Down Productions, 1989

Hip Hop is a world-view of those born after 1965. In the early 1970s, African American and Puerto Rican communities in New York City's South Bronx gave birth to a culture of music, spoken word, graphic art, dance, and fashion. They termed this culture "Hip Hop." (To make it clear, although rap music gets most of the attention, as noted above, there is more to Hip Hop than rap.)

In "Keepin' It Real, Keepin' It Right," [14] educator D. Miles Brady discusses being a Black student in urban high schools in America. He quotes James Cone in his groundbreaking work of 1969, "Black Theology 6-Black Power." Brady shares Mr. Cone's "kernel of truth": "This is a message to the oppressor, not in hope that he will listen, (After Dr. King's death, who can hope?), but with the expectation that my own existence will be clarified." Cone's insight made Brady asks: How will my own existence be clarified? How will the existences of young, Black students be clarified and respected?

Brady's and other African American's pursuit of "clarity" is directly linked to the history of enslavement of Africans in America. Having their home culture (languages, religions and kinship systems) stripped from them, they were left no alternative but to learn their master's language, values, and institutions [14].

"If violence is wrong in America, violence is wrong abroad. If it is wrong to be violent defending black women and black children and black babies and black men, then it is wrong for America to draft us, and make us violent abroad in defense of her." ~ Malcolm X

Yet, most African Americans, for the sake of their sanity, were at the same time left no choice but to reinvent themselves. With no tenable link to Africa and the desire to distance themselves from their enslavers, Blacks created and recreated forms of cultural expression and thus valid personal identities [14].

According to Brady, out of this same desire for re-creation was born the clarifying potential of Hip Hop culture which he describes as "…an artistic rebellion against the humiliating deadness of western culture. It is a culture reflecting its own values of respect, loyalty, and authenticity."

Despite its various styles, Hip Hop is about "keeping it real" and remaining authentic to the culture. For example, as a narrative of survival and independence, the successes of authentic rap music comes from not giving away one's music to mainstream culture and speaking and acting out on those who do [14].

We can see within the DNA of Hip Hop is the constant process of the clarification regarding authenticity. In the world of Hip Hop, youth who misuse the genuine values of the culture are identified as "posers" or "busters," or "sell-outs who need to get the hell out." Again, Brady points out that genuine rap is not all about "the cheese" (money) or being the top "player" or pimp. However, when White media deemed certain styles of rap as being "gangsta" rap, soon ignorant and "wack" MCs (rappers) began "wanna be" attempts to live up to this reputation. The original gave way to the copy. *Commercialization turned Hip Hop into "hip pop"* [14].

**4.2.1 Problems that Plague the Hip Hop Nation and Black Students in Urban Schools.** In Brady's [14] estimation, our urban public schools are a culture that misunderstands real identities of young Black men, preferring to devalue them, and find them to be somehow unmotivated and/or threatening, even criminal. He says, unfortunately many times these young men will live up to the reputation. Or, some fall into categories of "racelessness," attempting to cut out blank, generic identities. Others, who do not try to fit into the Black urban mainstream, or who try to fit into the larger society are dubbed by their peers to be "defectors" and called "oreos" or "incognegroes." So, how can young Black men "keep it real"? More importantly, how can our urban public schools help marginalized urban youth of all colors find clarity and be authentic?

"Hip Hop [is] a 'Critical Cultural Movement' due to its historic and continued orientations towards healing broken families and supporting cultural and spiritual connectedness; resisting and critiquing peoples, spaces, and systems that promote fragmentation and divisiveness; and fighting (literally) for a peaceful, restorative, and humanizing existence--a movement towards self-actualization." ~ Thurman Bridges [15]

**4.2.2 How Can Our Urban Public Schools Help Black Urban Youth (and All Urban Youth) be Authentic?**

"Urban students are asked to trade the culture of their home and community for the 'higher culture' of the school in exchange for access to college. This reduces the life choices of students into a false binary, that of choosing between staying behind as a failure, and 'getting out' as a success. Faced with the prospect of leaving their communities behind to be successful, many urban youth opt out of school. They choose to retain an urban and cultural identity they perceive to be in conflict with the expectations of schools, even if the cost of that choice is school failure. To be effective,

urban schools must begin to develop partnerships with communities that provide young people the opportunity to be successful while maintaining their identities as urban youth." ~ Dr. Jeffery Duncan-Andrade

Yaacov Hecht's [13] Institute for Democratic Education (http://www.democratic.co.il/en/about-us) provides urban schools a way to enable students to be more authentic. The IDE envisions schools as crucibles for self-actualization and the realization of human freedom. Such a vision validates Hip Hop culture which is the crucible for urban youth to clarify their identity and be who they are potentially.

If what Yaacov asserts is true and viable, that "A democratic culture is one that guards the equal right of every individual for self-actualization," then we can also say, "A Hip Hop culture is one that guards the equal right of every individual for self-actualization."

Educators must realize urban students are in a existential dilemma: feeling unrecognized due to the one-size-fits-all controlling normalcy of the dominant culture, they know if they assimilate this culture, they will not be authentic.

This is profound and key to making current failing urban schools work for the many disaffected students.

**5. Discussing the Potential of Self-Actualization to Reduce Negative Aggression and Violence**

By enabling self-actualization and not assimilation, self-affirmation will not be blocked, nor will self-assertion be "thwarted." As basic levels of power are respected and provided expression, and our psycho-social needs are met, the reason and potential for negative aggression and violence will be neutralized.

"We each have an insatiable appetite to be respected, appreciated, valued, and heard." ~ www.lifemoxie.com

As was noted, according to Maslow [5] we all have a need for recognition--a sense of significance and fulfillment that is innately self-satisfying, and is appreciated by others. Unfortunately, indeed, people may starve for food, but we do not live by bread alone, and people also "starve for recognition." Yet, what if recognition cannot be obtained legitimately, will persons be motivated to obtain it somehow, in whatever form and degree--one way or another?

In *Power and Innocence*, Rollo May [6] argues that when our need for recognition/significance is blocked, we become assertive. This is natural. If our assertiveness is blocked and we still do not get the recognition and sense of significance we are seeking, we may become aggressive. If others continue to ignore us no matter what we do, or if our need to fulfill our possibilities is blocked, the soil is made ready for the seeds of alienation, uselessness, and hopelessness--and we may be inclined to violence.

"Writing saved me from the sin and inconvenience of violence." ~ Alice Walker

**5.1 The Issue Is Indifference, Not Violence**

Power corrupts, but so does powerlessness [6]. The problem is: in order to decrease the potential of negative aggression and violence we must recognize the underlying causes of the social disease of impotence. When a person's need for recognition is stifled; when their sense of justice is ignored; when they feel they have little influence over events; when they become frustrated when kept from realizing dreams, ambitions, longings, ideas, full-filling their potential and actualizing who they are, they can become apathetic. Violence is not the child of power, but of powerlessness [6].

"The Church is in the world, it is part of the suffering in the world, and though Christ condemned the disciple who struck off the ear of the high priest's servant, our hearts go out in sympathy to all who are moved to violence by the suffering of others. The Church condemns violence, but it condemns indifference more harshly. Violence can be the expression of love, indifference never. One is an imperfection of charity, the other the perfection of egoism."   ~ Graham Greene, *The Comedians*

Apathy is the stage before violence. We can only imagine the complete lack of significance, or sense of fulfillment and influence, and the feelings of nothingness that are inside the mind and heart of each of society's most violent.

Holocaust survivor Elie Wiesel looks at it this way:

- The opposite of beauty is not ugliness, it's indifference.
- The opposite of love is not hate, it's indifference.
- The opposite of life is not death, it's indifference.

Now, let us add: The opposite of peace is not violence, it's indifference; it's nothingness, in authenticity, impotence, and anomie. It's a human being's unfulfilled potential [16].

"Violence is the expression of impotence." ~ Bronowski, The Face of Violence

If these ideas have truth, Yaacov Hecht [13] has proposed one important way society can empower citizens, challenge indifference, enable the actualizing of our potential, and give people a basic sense of recognition and significance, therefore countering the causes of violence by way of self-actualization that comes through democratic education. See what democratic education is by watching this video: www.youtube.com/watch?v=BlECircdLGs.

People have voices, and they want to be heard. They want engagement. They have a sense of history, of what others have done, and what needs to be done. They want to feel important, to have a sense of power that is more personal and socially powerful—the power to be able to assert oneself, to exercise influence on the world, and to make a difference.

Are those performing the deeds of violence in society the ones who are trying, though anti-socially, to establish their self-esteem, defend their self-image, and demonstrate they too are significant? These needs of esteem and importance, by themselves, are potentially

constructive. Our human aggressive impulse arises not out of the excesses of power, but out of powerlessness--the feeling of insignificance that leads to the sense that nothing matters and that there is no other way to express or articulate it than through violence [6].

"Hungry people can't be good at learning or producing anything, except perhaps violence." ~ Pearl Bailey

When schools think democratically by following the advice of the IDE--enable students to articulate and follow their interests, goals, dreams, career interests, so as to reach their potential and self-actualize--there will be little or no need to be negatively aggressive in order to have the sense of significance we all seek.

## 6. Summary

"The love of violence is, to me, the ancient and symbolic gesture of man against the constraints of society. Vicious men can exploit the impulse, but it is a disaster to treat the impulse as vicious. For no society is strong that does not acknowledge the protesting man; and no man is human who does not draw strength from the natural animal. Violence is the sphinx by the fireside, and she has a human face." ~ Jacob Bronowski, *The Face of Violence*

This paper searches for answers to fundamental questions concerning the sources of violence [6]: What does violence do for the individual? What purposes are achieved through aggression & violence?

Maslow [5] and May [6] provided a possible link between the human need to be noticed and valued and the resulting negative aggression/violent behavior when these needs are unfulfilled. This brings

new views about healthy aggression [7], or the relationship between violence and indifference. Considering how meeting these fundamental human needs through practicing democratic education in urban public schools and an appreciation of current global youth culture as a means to reducing youth violence is proposed.

"Violence isn't always evil. What's evil is the infatuation with violence." ~ Singer Jim Morrison, The Doors

Yaacov Hecht [13] of the IDE helped develop over 30 public democratic schools in Israel. See: www.democratic.co.il/en/about-us. The theme of the schools is discovering and developing the uniqueness of each student and is based on the concept of self-actualization.

Democratic education involves pluralistic learning. It is the opposite of the simple one-size-fits-all "square" traditional public schools must utilize since educators cannot deal with the complexities of large and growing amounts of knowledge. This creates, inside the square, a bell curve where 30% are excellent and 70% are weak to mediocre. We tell students to go to school and they will be successful and make money, but Yaacov notes, due to the one-size-fits-all bell curve paradigm, few make it. Standardized testing makes the square more exclusive. Ignoring the variety of talents and interests students bring to school makes the "square" the most restrictive and consequently the least democratic [13].

It is no coincidence our innate impulse to clarity, to self-actualize, to be who we potentially are, gave birth to the clarifying potential of Hip Hop culture as it "rebelled artistically against the humiliating deadness of western culture" [14]. Reflecting its own values of "respect, loyalty, and authenticity," Hip Hop's pursuit of clarity through credibility is condensed in its slogan, "Keepin' it real." This is directly linked to actualizing one's personal uniqueness and integrity while remaining authentic to one's culture. In this way, authentic Hip Hop will manifest in the self-actualization needed for a more sustainable world.

It is through an ethos of democracy and validation of youth culture by pedagogies of recognition that our urban public schools can become crucibles for self-actualization and a means to clarity. Now students can be academically successful--all while maintaining their urban identities [17]. Such a school climate reduces the use of negative aggressive attitudes and behaviors as ways to meet our basic need for self-affirmation, recognition, and validation.

"Poverty is the worst form of violence." ~ Mahatma Gandhi

Finally, this paper suggests a relationship among democratic education, authenticity, and human aggression and violence. Noting that self-actualization reduces the aggressive impulse, the paper questions the triangular pyramid hierarchy created by the one-size-fits-all square in which traditional education is trying to fit all students, allowing for just a few to self-actualize. This triangle organization reflects the unsustainable competitive model for society, enabling violence. In the pluralistic learning [13] circle of democratic schools where uniqueness is the standard, everyone, not a few, can self-actualize.

## 7. Conclusions

As stated in the title of this paper, "They say that we are prone to violence, but it's home sweet home," leading Hip Hop artist Jay Z declares that the neighborhood that he calls home is full of violence and drugs, and where police takes their cut. This is "home sweet home" because this is his reality. This is the life in the "hood" where differences between men are met with violence for violence.

"I'm from the streets where the hood could swallow a man, bullets 'll follow a man. There's so much coke that you could run the slalom

And cops comb the shit top to bottom They say that we are prone to violence, but it's home sweet home Where personalities crash and chrome meets chrome."

~ Jay Z, "U Don't Know" http://rapgenius.com/Jay-z-u-dont-know-lyrics#note-70413

Jay Z challenges urban teachers to regard the daily realities their urban students face by making teaching for recognition a part of urban schools' pedagogy and curriculum.

This is very important because Jay Z also challenges urban schools to reconcile: a) the current purpose of education which has been reduced to a "test-prep pedagogy" [4] of rubrics and high stakes standardized tests; with, b) the need for authentic relationships, mutual respect, and true urban school reform--all of which are required to win the hearts and minds of urban students and their families.

Although individuals, not connected to Hip Hop, confuse Hip Hop with violence, it is Hip Hop that builds the framework of recognition in this paper. This structure serves as a lens by which to better understand the struggles and challenges facing our country's most vulnerable populations, such as the marginalized youth, by proposing a way to better serve them and forge hope in impoverished communities.

"The Roots of Violence: Wealth without work, Pleasure without conscience, Knowledge without character, Commerce without morality, Science without humanity, Worship without sacrifice, Politics without principles."      ~ Mahatma Gandhi

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# DIFFERENTIATED INSTRUCTION AT WORK: THE CREATION OF A CHECKLIST FOR BEGINNING AND PRE-SERVICE TEACHERS

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**Abstract**

Teacher education programs around the world often include periods of professional experience, or school placements. Such involvement in the training programs of practitioners is viewed as integral to shaping philosophy, imbibing practice and acquiring skills in the area of classroom teaching and management. However, classrooms have become complex places, with teaching staff often utilizing a varying repertoire of skill sets to accommodate academic, linguistic and cultural diversity. Many educators implement differentiated strategies to cater for the needs of student diversity. Pre-service teachers who observe these lessons often miss the essential elements, the nuances and the intuitive practice, as there is much to absorb during a typical observation session. Equipping them with a checklist refines this experience, giving them intentional and marked guidelines of what to watch for and how to build on their own emerging skill and ability. The current study, which employed Bandura's (1986) Social Cognitive Theory as its conceptual framework, utilized a qualitative ethnographic approach in order to gain a richer description of specific dynamics that impact on a pre-service teacher's professional experience. Pre-service teachers were observed during focus group discussions following a school practicum. Their responses and reactions were noted. Key statements were used as thematic codes and compared to pertinent literature in the field of differentiated instruction. The intersection of the data and the literature led to the creation of a checklist for use by beginning and pre-service teachers. The checklist may be used by teacher educators as an instrument to assist teachers in training, as it could potentially help with honing in on key elements of observation of classroom practice and differentiated strategies. Further to this, the checklist may be utilized by pre-service teachers and their mentor teachers to facilitate productive and specific dialogue relating the justification for and choice of strategies to accommodate student diversity in contemporary classrooms.

## Introduction

There is an integral need for teachers, across year levels, to cater for students of different ability levels, learning profiles and interests, through the use of differentiated strategies (Levy, 2010; Subban, 2006; Tobin & McInnes, 2008; Van Garderen & Whittaker, 2006). There is a growing need, additionally, for teachers to respond appropriately to the cultural and linguistic diversity in their classrooms (Algozzine & Anderson, 2007; Santamaria, 2009).Teachers intuitively know that students populations in contemporary classrooms are diverse, so it is important to plan formally for these differences as lessons and assessments are drawn together (C. A. Tomlinson & McTighe, 2006; C. A. Tomlinson, 2003).

Differentiated instruction essentially means that teachers are responding constructively and proactively to student needs (Munro, 2012). Differentiation has become integral to the contemporary classroom, with many universities, educational governing bodies and administrators now advocating the practice as central to best practice in the current learning climate. Differentiation supports student diversity in 21$^{st}$ century classrooms, by recognizing differences, and accommodating different learning preferences and profiles (Levy, 2010; Sands & Barker, 2004; Tobin & McInnes, 2008; C. A. Tomlinson, 2003; Van Garderen & Whittaker, 2006). High quality teaching considers that every student has access to high quality instruction, and quality curriculum (C. A. Tomlinson & McTighe, 2006). Learning, within the differentiated classroom, is consequently

maximized as both the teacher and student explore ways to demonstrate understanding (Levy, 2010; Opitz & Ford, 2008; Subban, 2006).  More recent research points to teachers being aware of equity pedagogy which compels a consideration of varied learning profiles, especially with regard to cultural and language diversity (Van Garderen & Whittaker, 2006).

It follows therefore that emerging and pre-service teachers are aware of the practice, especially when they are out on teaching placements, or teacher training sessions in schools.  Awareness and an understanding of the precepts and undergirding of this key practice, will inform their observation of teaching and learning.  Since observation is so central to pre-service and beginning teachers, it is logical therefore to ensure that this technique is utilized effectively as a learning tool (Blackmore, 2005; Richards & Farrell, 2011). The purpose of this paper is to discuss the thinking behind the creation of a checklist for teachers in training to assist them to formulate a knowledgeable judgment of whether authentic differentiation is indeed at work in a classroom.  Critiquing and reflecting on teaching practice in this manner hones in on essential skills to guide these individuals through their journey as effective educators in their own right.  The checklist is intended to prompt discussion between and among mentor and host teachers, and pre-service teachers assigned to them. Observation checklists have long been used as tools within the teaching and learning setting, to enhance and extend teaching and learning skills.

The impetus for this paper grew from a personal need as a teacher educator.  There is a need to see authentic differentiation in action.  Pre-service teachers often enter classrooms, bewildered and overwhelmed.  Channeling their vision and sharpening their focus onto vital elements in their immediate landscape can have far-reaching benefits.  The creation of this check-list was thus spurred as part of a teacher education program, for students in their second and third years of teacher training.

**Conceptual Framework**
The study uses Bandura's (1986) Social Cognitive Theory, as its point of departure.  This widely used educational framework, postulates the view that human behaviour is a function of inner processes. Applying this theory to the current study, suggests that teachers are influenced by environmental factors, as they accommodate student diversity.  Once teachers are equipped with strategies that empower them, they are more likely to implement these in their classrooms, and this is consequently likely to influence their attitudes and behaviours.  Furthermore, this section considers and investigates the strengths of using checklists as an instrument to assist pre-service teachers with honing in on their observation skills, and then assist them with reflexive practice.  Additionally, Bandura's (1997) views on teachers' self-efficacy beliefs reinforce the view that individuals gauge their personal capabilities through experience.  The success and/or failure of experiences in the classroom consolidate certain beliefs which then lead to particular behaviours (Bandura, 1997).  The theory also reflects on the notion that vicarious experiences have the power to influence beliefs and consequently behavior.  As such, a teacher who views another's lesson/teaching makes comparisons with their own practice; this in turn leads to a judgement and evaluation of their own routines, techniques and approaches.  Observation of this nature also has the potential to inspire valuable dialogue about practice.  The end result may be to propel the teacher to enhance their own teaching, leading to improved student outcomes.

**The Creation of a Checklist**
Thinking about checklists was prompted by Gawande's (2009) ideas, which propagate the view that checklists give individuals greater control in any situation.  They allow people to become aware of the plethora of information available to them, and to sharpen their understanding of that which is pertinent.  Speaking within the framework of medicine, Gawande (2009) explains that the

information explosion has resulted in greater expertise in many sectors. We know more, and this information is often complex (Gawande, 2009). Becoming aware of essential skills offers a more targeted focus, and thus derives greater benefit and accuracy in execution. Teaching is a complex activity, and during any one particular lesson, many activities occur concurrently (Richards & Farrell, 2011). Novice teachers are in a more expedient position to benefit from close observation if they are appropriately equipped with the skills to observe (Hammersley - Fletcher & Orsmond, 2004; Richards & Farrell, 2011).

Learning through observation is a powerful tool in teaching (Blackmore, 2005; Bradfield, 2012; Hammersley - Fletcher & Orsmond, 2004; Richards & Farrell, 2011). Pre-service teachers need to be taught what, how and what to look for in observing differentiation at work (Bradfield, 2012). This section investigates the factors that were borne in mind when creating the Differentiation Checklist. Pre-service teachers are often unarmed when they observe their supervising teachers, yet observation is a vital tool in honing in on the strengths and weaknesses of one's own practice. Using a checklist will free up their working memories, allowing them to think more intentionally about their own teaching practice in a deliberately reflexive manner. The creation of a formal protocol such as a checklist, has the potential to create stronger teachers, who engage freely in community talk around best practice (Blackmore, 2005; Bradfield, 2012). Ultimately, it is the student who benefits as better teaching results in much better learning outcomes. The discussion here focuses on the nature of classroom observation. In order to make effective use of observation, pre-service teachers need to be equipped with skills to make notes of what they see (Blackmore, 2005). Checklists provide a clear focus for observation, however, with a view to distinguishing the features of differentiation contained in a lesson, this checklist adopts a different perspective. The checklist has been formulated through a thorough perusal of literature pertinent to differentiated instruction in the last decade.

**Methodology**
This project utilized a qualitative approach, i.e., the use of focus group interviews. Focus groups were deemed appropriate in this context as it provided access to data that may not be obtained through one-on-one interviews (Morgan, 2013). This method allowed the researcher to observe a relatively large amount of interaction and discourse on a particular topic, in a relatively short time frame (Morgan, 2013). A focus group discussion also increased the potential for more honest, candid discussion among participants (Morgan, 2013). Furthermore, focus groups have the added benefit of being more loosely structured than individual interviews, and may thus tap into more upfront points of view. They also have the ability to present more in-depth views as participants present, concur and counter each other's views.

The target group for the collection of data for this project was students enrolled in their second year of teacher training at a metropolitan university in Melbourne, Australia. These 120 students were completing a Bachelor of Education course which included a mandatory round of 10 full days of school placement each semester. This placement involved observation, small group and whole class teaching, at both primary and secondary schools. Second year students were targeted as they had already been afforded some instruction in differentiation, and would be more likely to acknowledge such instructional techniques at work. Following school placements, and the acquisition of approval of the university ethics committee, students were invited to participate in focus group interviews. These invitations, along with explanatory statements outlining the purpose and format of the interviews, were issued following a lecture which most students attended. Participation was voluntary.

Twenty students responded to the invitation. Interviews, which involved groups of about five students, took place at the university, with comments being recorded on sheets of paper placed on

tables.  This was offered as a means to facilitate discussion, and to allow different perspectives of the placement experience.  The discussion was led by points on the sheets of paper but students were asked to also record points that they thought had been omitted. Offering a semi-structured discussion allowed for greater participation from pre-service teachers, and allowed them to input in the manner that they individually interpreted the points raised.  The focus group discussion was recorded for research purposes; this was supplemented by observer notes taken during the discussion.  This acted as a means of triangulation, and offered a form of validating the final themes.  Axial coding was used to analyse the data.

**Results and Discussion**
Data analysis involved the classification and codifying of data into common themes.  Responses were analysed using open, axial coding, as suggested by Strauss and Corbin (Strauss, 1990).  Participant responses, and their indications on paper, were broken down into discrete parts, then examined closely and analysed for similarities and differences (Strauss, 1990). Categories were identified through emerging ideas from the data (Strauss, 1990). Each category was named according to the data it represented, then analysed individually, with a view to determining the conditions that gave rise to them and the context in which they occurred.  The discussion following highlights each category emerging from the focus group interviews, and under each, the exchange and the written observations that were presented under the said classification.

**The structure, organization and development of a lesson**
*Focus group observations/exchange/notes:*
- *Classrooms were often structured differently from the traditional classroom, to cater for different styles of teaching.*
- *Teachers adopted different techniques to accommodate groupwork.*
- *Because of the structure of the room, the teacher could move smoothly from small-group teaching to whole-class teaching.*
- *Flexibly grouping students created greater opportunities for independent work.  Students worked better when they knew what the expectations were.*
- *Published schedules and task lists helped them to complete work more accurately.*
- *Students responded positively to flexible grouping, and appeared to gain more from working alongside peers with similar interests.*

Tomlinson (2003), a leading expert in differentiation, maintains that lesson structure, and classroom organization can be appropriately controlled to accommodate student variance.  Varying the student's workspace, in terms of seating and location, may assist with meeting certain educational outcomes (Education Department Alberta, 2005; Opitz & Ford, 2008; C. A. Tomlinson, 2003).  For example, a lesson that utilizes groupwork activities may benefit from the rearrangement of tables to facilitate group discussion.  Other students, who are more solitary learners may profit from being seated separately from the group, for a short period.  Gibson (2011) consolidates this view by explicitly stating that the physical environment of the classroom should be so divided to deliberately point students to areas of discussion and collaboration, and areas for quiet work.  These workstations assist with the flow of a lesson, and once routines are established, has the potential to increase output, interest and engagement (Gibson, 2011).

Furthermore, in order to improve efficiency in the classroom, the classroom should be organized so that students are aware of expectations and roles (Gibson, 2011).  Developing schedules that are clearly displayed, and which clearly let students know about when activities will occur, and their personal level of involvement in these activities, will assist not only with managing the group, but will improve the effectiveness of the lesson (Gibson, 2011).  For example, creating a schedule for

small group discussions, and at which workstation this discussion will take place, has the potential to assist both the teaching and learning processes. Similarly, a job chart which clearly outlines roles and expectations encourages good organization of the work space.

Research also supports the view that effective differentiated learning environments are developmentally appropriate for all students, and arranged taking particular student needs and capabilities into account (Renzulli & Reis, 2006; C. A. Tomlinson & McTighe, 2006; C. A. Tomlinson, 2003; Van Garderen & Whittaker, 2006). Seating plans to support activities, interaction, discussion and independent study, consider not only the diverse needs of the group, but also creates a productive, respected working space that can be owned by all participants. Once students become aware of the logistics of their space, they are more likely to embrace and support the set routines. Spaces and stations should be easily accessible, even labelled, to aid ease of use. Explicit modelling of the rules and the routine by the teacher inculcates this idea into students, thereby creating a cohesive environment that is dynamic, industrious and valuable.

**Classroom Management**
*Focus group observations/exchange/notes:*
- *Differentiated instruction worked well to address some classroom management issues.*
- *Accommodating different learning profiles meant that more students were engaged and their output was more productive.*
- *The teacher used multiple methods to become familiar with student learning profiles. She added to her notes constantly and sometimes modified individual plans for students. This significantly assisted with classroom management.*
- *It helped to provide instructions, explanations and notes in different forms. The teacher used the whiteboard, handouts and verbally read out instructions to the class. This assisted with getting and keeping students on task.*

Effective classroom management is central to authentic differentiation (Fox & Hoffman, 2011; Hall, Strangman, & Meyer, 2003). For many teachers, management and discipline in classroom settings, proves to be a challenge (McDonald, 2013). In fact, modern classrooms differ markedly from classrooms of a decade ago (Fox & Hoffman, 2011), as students are exposed to more information, and the need for interaction appears to have increased. Fox and Hoffman (2011) maintain that classrooms which implement differentiated instruction have fewer behavioural problems. Students may behave poorly when they are bored, alienated or disengaged (Fox & Hoffman, 2011). Engaging students, connecting with them on a personal level, and meeting their needs within this setting, is vital to good instruction and organization (Fox & Hoffman, 2011; Hall et al., 2003). Within this setting, the likelihood of student success is increased, thereby reducing the risk of failure (Fox & Hoffman, 2011). Consequently, successful students want to be involved and will embrace the learning experience with greater enthusiasm.

King-Shaver and Hunter (2003) discuss the view that differentiation in a classroom helps the teacher to better manage students. They reflect on several noteworthy strategies that could be implemented to enhance the efficiency within everyday classroom operations. Among these is the need to know student learning profiles with great accuracy, as knowledge of this nature empowers and equips teachers to cater for every student (King-Shaver & Hunter, 2003). Gibson (2011) develops this idea as well, and extends this to include the view that the establishment of routines is essential to sound classroom management within the differentiated classroom. Creating classroom and behavioural procedures is said to improve the flow of lessons, and allows the teacher to invest time in valuable small-group discussions (Gibson, 2011). Furthermore, clearly articulating expectations to students, in various forms both verbal and written, improves overall behavior and consequently assists with management and discipline(Gibson, 2011). For example, creating a wall

chart which clearly outlines behavioural expectations and the consequences of conforming/non-conforming presents a powerful visual cue for good behavior to all participants.

Tomlinson and Imbeau (2010) reflect wisely on the need to manage a classroom effectively and efficiently to ensure that differentiated instruction works to the benefit of the students. Classroom practice is to be treated as a learned art, one that is deliberately planned for, and one that teachers work hard at (C. Tomlinson, A & Imbeau, 2010). Within this intentionally planned setting, teachers are likely to be successful with differentiated techniques, as they will have more control and better direction. Fox and Hoffman (2011) suggest that adopting a more personalized approach, such as taking the time to learn individual names, and to know certain unique details about each child, allows students to feel respected and valued. Establishing this stronger relationship improves behavior and they are likely to perform better (Fox & Hoffman, 2011).

**Differentiated strategies/techniques during teaching**
*Focus group observations/exchange/notes:*
- *Varied techniques ensured that more students were active participants in the lesson.*
- *The use of differentiation gave all students a chance, and all felt like they were making some meaningful contribution.*
- *Using differentiation meant that the teacher became the facilitator, not just an authority figure.*
- *Differentiation allowed the teacher to become part of the discussion. She would often get students to lead and she would just mediate.*
- *Different means of presenting information meant that the students' working memories were not overloaded.*

The use of varied and differentiated strategies provides different ways of processing information, and accommodates a wider degree of learning preferences (Education Department Alberta, 2005; Opitz & Ford, 2008; Tobin & McInnes, 2008; Van Garderen & Whittaker, 2006). The use of tiered assignments, learning centres and individual goal-setting during a lesson, may prove to be valuable in meeting the needs of various students. Differentiated activities also increase the potential for active participation by more members of the classroom. Using small-group and whole class teaching allows for less formal discussion and whole group instruction to consolidate ideas (Hall, 2009; Kosanovich, Ladinsky, Nelson, & Torgesen, 2007). In a typical literacy lesson, teachers could create opportunities for brainstorming, discussion, writing and proof-reading. This idea is supported by Gibson (2009) who maintains that small group instruction increases opportunities for interaction among participants.

Within the context of differentiated instruction, Tobin and McInnes (2008) point to research that supports the view that flexible small group instruction yields greater benefits when compared to large group instruction, within the literacy classroom. Similar results were reported by Algozzine and Anderson (2007) who reflect on the use of flexible grouping and student choice as key differentiated instructional techniques that have the potential to improve student outcomes. Transitions between parts of a lesson also allow for a varied mode, so that different paces and interests can be accommodated within a lesson. Provide students with schedules and routine plans, so that they are aware of changes. Create a learning community that supports questions and comments, in a safe respected environment. Student prior learning is essential to the teaching of new concepts, so creative ways should be considered to make links between existing and new knowledge and skills.

Presentation and delivery modes should be varied as part of good teaching (Education Department Alberta, 2005; Van Garderen & Whittaker, 2006). This meets the needs of various abilities and

processing styles.  This also enhances understanding through different perspectives.  Reduce the load on the working memory by using handouts, summaries on the board and other visual cues. Repeat instructions, and mention key points in different ways at different points of the lesson.  Have less attentive students repeat instructions or vital points.  If students are expected to use key words, and remember core concepts, plan a variety of ways of reinforcing these ideas.  During teaching, teachers avoid becoming the transmitters of knowledge, instead, they see themselves as facilitators who share and participate actively in the process by relating to the content and skills taught (Renzulli & Reis, 2006).  This modelling and involvement has the potential to make real the subject matter (Renzulli & Reis, 2006).

**Differentiated activities, materials and teaching aids**
*Focus group observations/exchange/notes:*
- *Once students were engaged, they remained committed to task completion.*
- *Resources were used quite judiciously to cater for student interests.*
- *The use of technology helped keep students engaged but they required a great deal of structure to ensure that they remain on task.*
- *The use of film and audio clips throughout the lesson offered variety and engaged students.  It was different from the traditional lesson but very interesting.*

Within the metalanguage of differentiated instruction, "activities" and "resources" and often aligned with "process".  However, like Tomlinson and Strickland (2005) point out, not all activities are created equally.   Activities within the differentiated classroom should be meaningful, make significant connections between prior and new knowledge and extend student skills comfortably to a new level (C. A. Tomlinson & Strickland, 2005).  Consequently, resources within this setting should be utilized to consolidate knowledge and understanding, enhance problem solving skills and allow students to use the information they have received in an expressive manner (C. A. Tomlinson & Strickland, 2005).  It should consider presented information and skills from varied perspectives, encouraging students to become engaged and committed.  A valuable activity captures the attention of students, maintains this attention, and compels them to persevere with a task, even when it proves to be challenging.

The use of different teaching tools, materials and activities has been found to better accommodate student needs, as opposed to a unilateral method (Algozzine & Anderson, 2007; Education Department Alberta, 2005; Fox & Hoffman, 2011; C. A. Tomlinson; C. A. Tomlinson & Strickland, 2005). Tomlinson (2004) highlights the view that different learning preferences in the differentiated classroom appear to favour specific activities and particular presentations.  Using visual cues, and providing external storage methods that summarise content on whiteboards, charts, or data screens, all allow a different means of presenting information that will assist learners.  These multiple methods of presentation are products of rethinking the traditional classroom (C. A. Tomlinson & Allan, 2000).  Furthermore, the use of varied activities, gives students more choices, and consequently a sense of increased control over their learning (Algozzine & Anderson, 2007).  This has the potential to improve student responsibility and accountability with regard to their learning (Algozzine & Anderson, 2007).  For example, students in contemporary classrooms in the developed world are exposed on a large scale to technology, using social media sites and the internet.  Using both print and non-print texts within these mediums capitalizes on their partiality for technology, while keeping them engaged and interested.  Student activities should ideally be contextualized to student experiences.  For example, the use of a community newspaper to investigate news items may be preferable to a larger national broadsheet.  Using adapted means of presenting material, ideas or texts, also accommodates different learning preferences.  For example, the use of audio books, or film adaptations of texts may enhance understanding of the complex underlying issues contained therein.  Lessons which incorporate differentiated techniques often permit students to

utilize the internet for controlled periods, allowing students who have a penchant for such skill to rise to the challenge.

The use of visual mediums appears to be quite pertinent to contemporary classrooms. Using different means of presenting concepts and skills, such as short video clips, or filming students reciting poetry or using an audio book alongside a written text, all appear to have greater degrees of success in today's classrooms (Fox & Hoffman, 2011).

**Differentiated assessments and application**
*Focus group observations/exchange/notes:*
- *Assessment tasks that were varied and adapted in relation to student interests had greater success than just one means of assessment.*
- *The teacher used the multiple intelligences to assess – as a result, students could demonstrate their understanding using the means most suited to them.*
- *The teacher used ongoing assessment constantly – there was evidence of formative and summative assessment throughout the teaching of a unit.*
- *Assessments were interesting in that they did not merely asked students to reproduce information, they had to use the information to answer question, and apply their skills and knowledge in different contexts.*

Differentiating the means by which students demonstrate their understanding of concepts and skills, is essential to this model of learning and teaching (Renzulli & Reis, 2006; C. A. Tomlinson & Strickland, 2005). This type of assessment or evaluation of student learning should hone in on essential student learning and skills. They should propel students toward an application of what they have learned. In designing the task to test student understanding, teachers should consider the use of clear, challenging criteria that is based on grade-level expectations and that capture student interests and that promote student success (C. A. Tomlinson & Strickland, 2005). In a differentiated setting, evaluation of this nature has the potential to be quite impacting as it can be quite sensitive to student diversity. Most schools in the developed, contemporary world are driven by test-taking. While tests are one form of ascertaining and measuring student understanding and skills, it is not the only form. A reliable and true test of skills and knowledge considers how students can apply learning rather than merely restate information (C. A. Tomlinson & Strickland, 2005).

Furthermore, assessment within the differentiated classroom is ongoing (Hall et al., 2003). Consequently, a teacher within this context may negotiate a different assessment plan that is commensurate with student needs, interests and profiles (Fox & Hoffman, 2011). Within a differentiated classroom, students may be offered various means of demonstrating their understanding of a particular concept or a skill learned. Varying the level of complexity of an assessment task, will meet the needs of different ability levels (Education Department Alberta, 2005). Offering students choices in this manner accommodates their learning preferences, abilities and interests. In this regard, practitioner should consider varying the task itself rather than just decreasing the quantity/volume of a task. Students may be allowed to vary the mode of delivery in presenting an assessment task, if this is appropriate (Fox & Hoffman, 2011). For example, a teacher could permit the use of an oral presentation instead of a written presentation, or the presentation using a word-processor instead of a hand-written submission. Some students, with slower processing skills, who are keen to complete a task, may be allocated additional time. Other students may prefer to work within teams – within this context, a teacher may wish to consider a team presentation instead of an individual presentation. Within the differentiated, inclusive setting, teachers may choose to modify assessment tasks for students with disabilities by using tape-recorded elements that allows a movement away from the more laborious written assessment (C. A.

Tomlinson & Strickland, 2005). Differentiating assessments and the application of knowledge has the potential to enhance student's communication skills, by encouraging them to express themselves in a variety of ways (Renzulli & Reis, 2006).

Within this context however, teachers are often driven by a pre-determined set of criteria or benchmarks which students are forced to meet as part of a wider, state-led directive (Ankrum & Bean, 2007). Assessments thus, should incorporate and be informed by these gauges. In Australia for example, teachers are directed by the Australian National Curriculum, which advocates that progression into the next year level requires students to achieve certain targets and meet specific standards. Differentiation does not prompt a movement away from these standards, in fact, responsible differentiation considers these aspects closely, assimilates these elements into the assessment procedure, thereby allowing for a more comprehensive measurement and consideration of student growth.

The final checklist presents the discussion of items in random order, and was adapted from an itemized observational checklist created by Richards and Farrell (2011). The checklist also drew heavily on the views of leading proponents in the field of differentiation, and scholarly and instructional material offered to support practitioners. Depending on the sequence and organization of a lesson, teachers may choose to differentiate instruction with the product (application or assessment of skills or content taught), the process (activities which the student engages in during a lesson or strategies used by the teachers to transmit skills or content) and/or the content (skills or information that the student will need to know). A literary search through various educational databases of both scholarly and anecdotal practitioner reports, that combined differentiated instruction and items relating to Richards and Farrell's (2011) observational checklist, yielded a plethora of ideas.

**The product: The checklist to observe differentiated instruction at work**

|  | YES | NO | COMMENT |
|---|---|---|---|
| **The structure, organization and development of a lesson** |  |  |  |
| Are tables and seating arrangements varied to accommodate student groupwork? |  |  |  |
| Are there areas for collaborative activities and other areas for solitary, independent work? |  |  |  |
| Has the lesson been structured in a particular way to accommodate student differences? |  |  |  |
| Are there explicit displays of classroom roles, expectations and routines? |  |  |  |
| Are there schedules on display that indicate a systematic plan for the lesson's activities? |  |  |  |
| Is there a statement of the rules and behavioural expectations within the classroom? |  |  |  |
|  |  |  |  |
| **Classroom Management** |  |  |  |
| Is there evidence of overt and explicit classroom management strategies in place? |  |  |  |
| Are there procedures in place to minimize unacceptable behavior and to reinforce acceptable behavior? |  |  |  |
| Are there visual cues (for example wall charts) that outline the consequences of unacceptable behavior? |  |  |  |
| Is the teacher's role one of a facilitator and participant in this setting? |  |  |  |

| | | | |
|---|---|---|---|
| Has the flow of the lesson been timed to allow for smooth transitions between activities and teaching? | | | |
| | | | |
| **Differentiated strategies/techniques during teaching** | | | |
| Have varied activities and techniques been utilized during the teaching segment of the lesson? | | | |
| Is there a combination of whole-group and small group teaching as part of the lesson? | | | |
| Are groups formed flexibly or along ability levels? | | | |
| Is the lesson paced appropriately to accommodate different ability levels and learning styles? | | | |
| Is key information presented in different ways repetitively during the course of the lesson? | | | |
| | | | |
| **Differentiated activities, materials and teaching aids** | | | |
| Are the activities and materials used during the lesson age/grade-appropriate and engaging to students? | | | |
| Have the activities considered the varying interests/learning profiles and ability levels in the classroom? | | | |
| How often is technology utilized as part of the lesson? | | | |
| How is the use of technology (such as iPads, laptops and computers) negotiated to accommodate different learning profiles? | | | |
| Are the activities an extension of the lesson, and do they reinforce skills taught? | | | |
| | | | |
| **Differentiated assessments and application** | | | |
| Are there different assessment tasks offered to students to demonstrate their understanding of the knowledge or concept? | | | |
| Are the assessment tasks sensitive to student diversity? | | | |
| Are students permitted to demonstrate understanding using different mediums (for example, presenting information through a video clip as opposed to a written piece?). | | | |
| Is the assessment task mindful of the relevant policy documents that govern evaluation and progression at different grade/year levels? | | | |
| Are tasks modified to accommodate students with additional learning needs? | | | |

**The Etiquette of Classroom Observation**

In conclusion, as both a teacher and a teacher-educator, I feel compelled to add a personal note about the etiquette of classroom observation. The checklist should certainly not be viewed as an instrument to critique a teacher at work in a critical or judgemental sense. The checklist is a tool to foster productive and constructive dialogue between mentor teachers and novice/pre-service teachers. It is intended to spark conversations within learning communities. It should be used in a completely non-invasive manner. Lesson observation is vital to best practice, but both the observer and the practitioner should bear in mind, that teaching is very often intuitive. Decisions about planning and management are often intuitive and can be justified within a collegial setting where all participants feel respected and valued. Beginning teachers should supplement the checklist with personal annotations, thus creating points for discussion in the conversation following observation.

This also allows for a movement away from "checking the boxes". Observation is an active process, it is participatory and involved. Both the novice and mentor teacher need to be contributing to this process. The checklist should therefore be used intentionally as a tool to encourage and build.

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# VISUAL ARTS TEACHING AND LEARNING: EFFECTS OF PROBLEM BASED LEARNIG METHOD (PBLM) AND TRADITIONAL TEACHNING METHOD (TTM) ON PUPILS ARTISTIC PROCESS SKILLS IN THE NORTH- EAST REGION, NIGERIA, WEST AFRICA.

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**Abstract**

This study determines the effects of PBL (Problem-Based Learning) and TTM (Traditional Teaching Method) on Pupils artistic process skills in Visual Arts in North-east, Nigeria. The objectives were to determine the artistic process skills and gender differences, hypotheses were raised and tested. Constructive Theory of teaching and learning provided support for the study. Quasi-experimental design of pre-test, post-test nonequivalent group made up of two experimental groups and one control group were used. The target Population was primary five pupils in registered private schools. Purposive and simple random sampling techniques were used to select four schools and three hundred and ninety nine (399) Pupils to participate in the study. The research instrument used was Artistic Process Skills on Creative work (APSC). Which was found to be valid and reliable with reliability coefficient 0.77, was ascertained using Cronbach Alpha. After twelve weeks of instruction by the researcher and some research assistants, the subjects were post-tested using the instrument. Inferential statistic of one way Analysis of Variance and Scheffe post - hoc comparison was used to test the hypotheses formulated. Decision on the result was taken at $P<0.05$. The results showed that pupils taught visual arts using the PBL performed significantly better in acquiring artistic process skills than those taught using the TTM and showed no significant gender difference in acquisition of artistic process skills while using both methods. It was concluded that, PBL is more effective than TTM and recommended to be introduced in teaching and learning visual arts education to primary schools pupils in North-east part of Nigeria.

**Keywords**: Problem-based learning, Traditional teaching method, Artistic skills and Gender.

## INTRODUCTION

People live in a time of visualization, the time in which visual information are more common than verbal. In order to understand this information, pupils have to be familiar with both verbal and visual symbols. Comprehending visual symbols requires more than in born abilities. That is the reason why the Visual Arts Education is uniquely important: It stimulates gradual comprehension, perception and awareness of visual symbols and teaches pupils how to use these symbols (Tacol, 2004). It is therefore important that pupils, as part of the learning process of the Visual Arts Education, not only develop their manual skills and Perceptual tendencies, but also gradually acquire knowledge about various concepts of visual Arts and regulations of their use in visual expression. All these are necessary in order to be part of the contemporary world of visualization. Those skills need to be developed in a very subtle manner at an early age. The development of pupils through Visual Arts Education can be successful only if their visual skills are developed on every level i.e emotional, psychomotor and cognitive. Pupils will thus, gradually acquire skills to verbalize these concepts and spontaneously produce their own creative pieces of work. Visual Arts Education is essential to Pupils intellectual, social, physical and emotional development. Through the study of Visual Art, pupils not

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only develop ability to think creatively and critically but also develop physical dexterity, the ability of cooperation and to work both independently and with others. In addition, creative and practical work encourages pupils to express themselves in both verbal and nonverbal ways, it can enable them to discover and develop abilities that can be rich sources of pleasure later in life. Study of Visual Arts can also broaden pupils horizon in various ways. Through the study of arts, pupils learn about artistic traditions of their own and other cultures (NAEA, 2005). Pupils develop the ability to communicate through various artistic media and appreciate Visual Arts as an important medium for recording and communicating ideas and feelings.

The essence of understanding Visual Arts concepts and creating visual expression can be presented through Problem Based Learning Method. This is the highest level of learning, characterized by tangible results and high quality education. The teacher can elucidate an artistic problems in many ways; by evaluating their work after the pupils have expressed the artistic Problem Visually, or before the process of Visual expression by stimulating students creative ability enabling the pupils to pick up basic concepts of the visual arts. This approach allows the interchange between perception, comprehension and motoric activities. Aldwel (2008) lamented that, the organization of problem-based learning method in the Visual Arts Education requires creativity and an appropriate professional qualification of the teacher. The Teacher has to be creative and practical at the same time in order to teach his pupils to observe, perceive objects and phenomena from their environment in a certain way, thus, stimulating their understand of the Visual Arts concepts and enhancing their creative visual expression.

The old process of Visual Arts Education was focused on presentation of words, direct copying from the text book or the teacher draws the pupils copy, which sometimes help pupils to know just the materials and tools but neglecting the pupils manual skills and cognitive development. This is why special attention needs to be paid to the system of Visual Arts Education, in which pupils can continually and according to their ages develop the abilities of visual perception, presentation and expression in the visual arts. There is need to be a balance between the capability of communicating verbally and through visual symbols. According to Gillian and Jones (2003), the process of teaching and learning in Visual Arts Education has become a multifaceted activity, synergism activating Pupils brain hemispheres and allowing different affective, motor and cognitive development. The most effective method for inducing this development- perceiving and activating emotional, psychomotor and perceptive function is through the Problem-Based Leaning.

Studies conducted by James (2002) and Tacol (2004) showed that, in problem based learning, the role of the teacher is duly to direct pupils individual ways of thinking, perceiving and communicating. The teacher has to be fully aware of the aim of Visual Art Education in order that the artistic development of the pupils is successful and their emotional, psychomotor and cognitive development is complete. The pupils are encouraged to assume responsibly of their study to acquire knowledge of visual Arts concepts, gain manual skins and develop emotionally and socially. At all school levels, the aim of problem based leaning is not just to encourage pupils to express themselves in visual arts but also teach them to understand the concept of visual arts, to seek and find them in the environment and nature, Problem based learning method arouse pupils interest and motivates them to find a visual solution to an artistic problem through creative visual expressions. The complexity of the task increases as pupils grow older and pass from elementary schools level to secondary schools levels. Problem based learning method is an instructional strategy that challenges pupils to learn how to learn. It starts with problem to be solved rather content to be mastered and has been found to be very effective. The theoretical framework for this research is the constructivism theory of teaching and learning, developed by Bruner (1966). The theory states that learning is a social and active process in which the learner constructs new knowledge for him/herself and each learner constructs meaning as he/she learns based on past and current knowledge.

Therefore, the constructivism theory provides the basis for this study, because Problem Based Learning just like the constructivism theory is a student centered method of learning and teaching of which individuals are active agents, who purposefully seeking and constructing knowledge, skills and attitude within a meaningful context.

Studies reviewed on effects of Problem Based Learning and Traditional Teaching Method on pupils performance in skills by Shepherd (1998); Moursaud (1999); Paris, Byrnes and Pari (2001); Green (2002); Raymond and Ogunbameru (2005); Meale (2006); Koening, Endorf and Braun (2007); Gokhale (2005) and Mohammed (2010) showed that students in problem based learning method class performed significantly better than their counterparts in traditional teaching method class in acquisition of skills in different discipline.

The aim of Education is to get pupils to develop the functioning knowledge which allows them to integrate academic knowledge basis (declarative knowledge), skills required for the profession (Procedural knowledge) and the context for using them to solve problems (conditional knowledge). In order to acquire that integration to achieve the aim of Education, the traditional way of teaching and learning has to be reduced. Hmelo (2004), opined that problem based learning by its sole nature requires a different way of using knowledge to solved problem. What Hmelo refers to is that kind of functioning knowledge, professionals required in real working situations, which help to retain information for lifelong learning.

Evidence continues to show that in Nigeria, particular in the North eastern region, Visual arts Education at the primary school levels is beset with several problems traceable to entry characteristics of the learners, educational opportunities provided to the learners, home socio-economic status, sex role stereotyping, pupils attitude, curriculum implementation short comings, societal and managerial problems, supply and qualities of visual arts text books and low supply in quality and quantity of Visual Arts teachers. Others are the structure of the visual arts curriculum and the instructional strategies of imparting the knowledge and skills. Among these problems the one which has most attracted the researcher is the methodology of teaching Visual Arts Education at the primary school level in the North-east part of Nigeria.

**THE PROBLEM**

Researches were conducted on factors responsible for the poor performance of pupils in Visual Arts Education by Adejamilua, 2004; Oyewole, 2005; Adediran, 2005 and Mbahi, (1991) at different point in time, these factors include, shortage of qualified art teaches, shortage of facilities, equipments and instructional materials; the nonchalant attitude of students, teachers and parents towards teaching visual Arts. There are however scarcity of studies on teaching method. These scarcity, suggest the need to look at the effect of teaching methods such as the PBLM and TTM on pupils performance in artistic process skill (Psychomotor domain) and gender only. The PBLM has been used in other developed Nation and was found to be very effective in the improvement of the performance of pupils/students in different disciplines. The PBLM is under-utilized and over looked in Nigeria. This is what informed this study.

**AIMS AND OBJECTIVES OF THE STUDY**
The aims and objectives of this research are to determine whether pupils taught visual arts using the PBLM:
1.      acquire artistic process skills better than pupils taught using the TTM
And whether there is gender difference in
2.      Artistic process skills of pupils taught visual arts using the PBLM and TTM.

**HYPOTHESES OF THE STUDY**

The following hypotheses were raised and tested

HO$_1$: There is no significant difference in the acquisition of artistic process skills of pupils taught Visual Arts using the PBLM and the TTM.

HO2: There is no significant gender difference in the acquisition of artistic process skills of pupils taught Visual Arts using the PBLM and the TTM

**METHOD**

**Research Design**

A pretest-posttest nonequivalent quasi experimental design was used for this study in order to determine the effectiveness of PBLM and TTM on Pupils artistic process skills in Visual Arts. The quasi experimental design was chosen because subjects were not randomly assigned to treatment and comparison groups, therefore intact classes were used, this is necessary by the fact that the study lasted for twelve weeks and as such it was not necessary to disrupt normal classes by randomizing pupils.

**Population and sample**

The target population for this study was all the primary five (5) pupils in registered private primary schools in the North-east region in Nigeria. The use of private schools was necessary because the private schools teach visual Arts subjects. At the time of the study, there were forty (40) registered private schools in the region. A total of four (4) registered private primary schools were selected using the purposive sampling techniques to participate in the study. The sample size was made up of 399 primary five pupils. The random sampling technique was used to select two (2) experimental groups and the one (1) control group in each of the schools. A trained research assistant on PBLM and TTM was attached to each of the four schools selected.

**Research Instrument**

The Artistic Processing Skills on Creative Work (APSC) pro forma designed by the researcher was used, of which pupils drew and painted real objects given to them using the element of design. The instrument was pretested using primary five (5) pupils who did not participate in the main study. The instrument has a reliability coefficient of 0.77 which was ascertained using Cronbach Alpha.

**RESULT**

Hypothesis One (HO1); There is no significant difference in the acquisition of artistic process skills on pupils taught Visual Arts using the PBLM and TTM.

**Table 1.0A: One way ANOVA on effects of PBLM and TTM on Pupils acquisition of artistic process skills**

| Test | Source | Sum of Squares | Mean of Square | df | F | Sig |
|------|--------|----------------|----------------|-----|-----|-----|
| Pre- test | Between Groups | 83.999 | 14.999 | 2 | .512 | .600 |
| | Within Groups | 32472.894 | 82.002 | 396 | | |
| | Total | 32556.893 | | 398 | | |
| Post-test | Between groups | 54157.064 | 27078.532 | 2 | 335.411 | .000 |
| | Within groups | 31970.004 | 80.732 | 396 | | |
| | Total | 86127.068 | | 398 | | |

Table 1.0A is one way Analysis of Variance pre-test, post-test on effects of PBLM and TTM on pupils acquisition of artistic process skills. The pretest result showed no significant difference at. 006 Level while the post-test result of the one way ANOVA showed significant difference with an F-ratio of 335. 411 at P=0.005. This when compared with the critical value 3.02 shows statistical significant difference on Pupils artistic process skills. Based on this result, it is clear, that one of the teaching methods yielded higher result in acquisition of artistic process skills.

**Scheffe Post-hoc Comparisons**

The one way ANOVA result in table 1.0A indicates significant difference in acquisition of artistic process skills, but did not show which of the method is more effective. Scheffe test for post-hoc comparison was applied to determine which of the methods is more effective.

**Table 1.0B: Scheffe Test difference on effects of PBLM and TTM in Pupils acquisition of artistic Process Skills**

| Variable Group (1) (J)Group | | Mean difference (1-j) | Std error | Sig |
|---|---|---|---|---|
| TTM group | Control group | -96132 | 1.10397 | .685 |
| | PBLM group | -24.17910 | 1.09771 | .000 |
| Control Group | TTM group | -96132 | 1.10397 | .685 |
| | PBLM group | -25.14042 | 1.10397 | .000 |
| PBLM Group | TTM group | 24.17910 | 1.09771 | .000 |
| | Control group | 25.14042 | 1.10397 | .000 |

Table 1.0B is Scheffe post-hoc comparison on acquisition of artistic process skills by pupils in PBLM, TTM and Control groups. The difference in mean score of PBLM as compared to those  in TTM and Control group classes were 24.17910 and 25.14042 at P=0.05. This difference in mean scores showed that, the PBLM is more effective than the TTM. Hence, Pupils in PBLM group acquired more artistic process skills than those in TTM and Control group. By this, the null hypothesis was rejected.

Hypothesis Two (HO$_2$): There is no significance gender difference in the acquisition of artistic process skills by pupils taught Visual Arts using PBLM and TTM.

Table 2.0:    One way Analysis of variance on effects of PBLM and TTM on gender in acquisition of  artistic process skills by pupils.

| Test | Sources | Sum of Squares | Mean of Square | df | F | Sig |
|---|---|---|---|---|---|---|
| Pre-test | Between group | 69.128 | 69.128 | 1 | .845 | .359 |
| | Within group | 32487.764 | 81.833 | 397 | | |
| | Total | 32556.892 | | 398 | | |
| Post- test | Between group | 3.224 | 3.224 | 1 | .015 | .903 |
| | Within group | 86123.843 | 216.937 | 377 | | |
| | Total | 86127.068 | | 389 | | |

Table 2.0 shows summary of one way ANOVA on effects of PBLM and TTM on gender in acquisition of artistic process skills by pupils. The summary in the post-test column shows no statistical significant difference. Data in this table shows an F-ratio 0.15 at P value = 0.05. This when compared

with the critical value of 3.86 shows no statistical significant different in gender. Therefore, gender has no significant difference in acquisition of artistic process skills using both methods. Hence, the null hypothesis was accepted.

## DISCUSSION AND CONCLUSIONS

This study was designed to determine the effects of PBLM and TTM in teaching Visual Arts subjects in primary schools in North-eastern part of Nigeria. Based on this, the constructivism theory of teaching and learning was used. Bruner (1998) contends that PBLM improves problem solving skills because the pupils are confronted with different interpretations of given situation. After conducting a statistical analysis on the post-test scores obtained by pupils, it was found that, pupils who participated in PBLM group achieved significantly better in in acquisition of artistic process skills. According to Vygotsky (1978), that PBLM students are capable of performing at higher skills levels when asked to work using real life situation than when asked to copy, trace or duplicate. So also in this research work, pupils made use of real life situation to draw and give meanings.

The  PBLM in this study, provided pupils with opportunities to put in practice what was read, seen and learned. The active participation settings facilitated discussion and interaction and this helped pupils to learn from each other's scholarship, skills and experiences. Furthermore, the superiority of PBLM over TTM could be attributed to the logical and sequential manner with which instructions are presented in PBLM technique and practical skills teaching. A student who is exposed to this type of method is more likely to posse a meaningful in depth   knowledge and skill of the content area. This shows that, pupils in PBLM group had significantly increased their Visual Art artistic skills from Pre-test to Post-test and also were able to depict what was given to them from previously learned materials. Cursory observation of the Pupils art works, shows that, pupils in PBLM group have acquired better artistic process skills than their counterpart in the traditional teaching and control group, meaning the pupils in PBLM group were able to combine the various types of physical abilities in creating their artworks. The pupils in PBLM group combined manipulative, endurance and flexibility in drawing and painting the orange given to them. The PBLM group was able to be précised, articulate and naturalize while working than those in the TTM and control groups.

The PBLM group used their abilities to depict the real life orange given to them using the element of design to an extend by putting the lines, shape, texture, colour and tone in space properly than their counterparts, most of the principles, concepts and techniques taught were applied by the PBLM group also the PBLM group were able to use the tool and materials correctly, this findings collaborates with research works of Shepherd (1998), Moursuad (1999); Paris, Brynes and Paris (2001); Green (2002); Raymond and Ogunbameru (2005); Meale (2006) and Koening, Endorf and Braun (2007) and Mohammed (2010) who reported that students in PBLM classes demonstrated a high level of practical skills in their course of study than those in TTM classes. According to them, that, students not only acquired the knowledge in PBLM classes but also know the process to use the Knowledge acquired.

Finding on gender shows that males and females in the two instructional strategies performed equally in the acquisition of artistic process skills. The result shows that PBLM and TTM have no effect on gender. The lack of gender difference in the PBLM group could be attributed to the fact that PBLM narrows gender gap and also due to Pupils active and social involvement in the teaching and learning process.

It can therefore, be concluded that PBLM can be said to be an effective method of teaching visual Arts subjects than the TTM for acquisition of artistic process skills. This study has shown that, Teachers predominant usage of TTM is the contributory cause of Pupils failure in the subject. The usage of TTM has great implication for the Visual Arts curriculum, because the content of the

curriculum have not found fulfillment in the area of teaching and learning in view of poor application of teaching method. If the essence of instruction is to inculcate problem solving skills, then PBLM is one. Also PBLM is not affected by the sex of the pupils.

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# EDUCATIONAL INNOVATION AND RESEARCH AT THE CROSSROADS FOR CLIPPINGS IN SPANISH UNIVERSITIES

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**Abstract**
The severe economic crisis affecting the European countries, especially the Mediterranean watershed ones, is changing behaviours and demeanour that in the near future will make us think over. The best college generation of a country is looking for work abroad, because they cannot find it in the country where they were formed. The budgets for research, engines of development, are trimmed dramatically. The ability to develop consolidated research groups and educational innovative groups to analyse the combined problem of education, absenteeism, desertion, rates of success and failure is weakened by the lack of funds to support our universities and the lack of support from the regions that dramatically reduce its annual budget. Alike, the university's faculty is becoming more loaded with classes, being able to spend less time on innovation and research, pillars of the XXI century university. The latest cuts in 2011, 2012, 2013 and coming up in this 2014, marked this article that analyses the evolution of educational innovation funds in the recent years, the types and number of projects developed, the teachers involved and the results obtained. Conclusions merge to a point where a reflexion period, surrounded by difficulties must end in creativity, through innovation and research, nowadays affected to a degree of absolute instability.

**Keywords**: educational innovation, economic crisis, national accreditations, Bologna process.

## INTRODUCTION

"Research is the foundation of teaching." Simply a short phrase in the Universities Act 2001 (Article 39.1), it changed outlooks, forged a change of criteria, and established a fundamental separation between professors.

A gap was discerned between the purely teaching professor, the technological and technical professional who enjoys teaching and gives lectures in technical schools, and the research professor who is more concerned with basic and applied science than with the classroom tasks that usually involve numerous groups and beginner courses whose complexity is considerable due to both expected learning outcomes and to the tension originated by the high number of teaching hours, the large breadth of content, and the lack of weekly periods designed to carry out other activities that are not purely academic.

Furthermore, the evaluations of the National Agency for Quality Assessment (ANECA) on teaching and professional activity were scarce: 35 points for national accreditations of Full Professor and 40 points for Associate Professor, in contrast to 55 and 50 points for research, where at least 24 indexed publications to the first figure were required, and a minimum of 12 for the second one, on the basis that every six years of research amounted to 15 points. [1]

A training model was questioned, one which was based on the optimal synergy of professional and research experience, and whose effectiveness was beyond doubt as evidenced by the emerging professionals from these schools, who are able to perform civil works such as the Panama Canal (Sacyr), the Seattle tunnel (ACS - Dragados), the TGV Medina - Mecca (OHL) or ports like Açú in Brazil (Acciona) [2].

Our best generation of qualified, well-trained professionals and engineers are "condemned" to look outside for human solutions and vital development, often because of a lack of planning in infrastructure, education and research, which are three of the cornerstones of a progressing society.

On these premises, where the college professor adapts to new technologies in a chameleon-like manner, a new branch appeared within the engineering curriculum: educational innovation.

The Technical University of Madrid (UPM), as part of its plan of continuous improvement of activities and quality of education, launched in 2005 the Educational Innovation Projects, which despite cuts, frustration, and economic difficulties have led to a deeper insight into the perspective of the professor and the "client", our students, the *raison d'etre* of the university, in view of a high-level of training.

**METHODOLOGY OF UPM – EDUCATIONAL INNOVATION AND RESEARCH**

As the Spanish writer and poet Antonio Gala says "Nothing underscores a lack as much as the attempt to hide it ". Confucius said, "A man who has committed a mistake and doesn't correct it, is committing another mistake".

The solution for a crisis cannot be considered without training, research and innovation. Any cut in this area is dramatic. Working groups take years to consolidate and to give results, but they are dissolved in an instant, shifting from pleasure to guilt, from prosperity to starvation. At this time, if our hearts as teachers began to think, they would cease beating.

The different educational plans of UPM, in reference to the policies of educational innovation, had a number of evident targets, based on the student support gained at a period of economic stability, among which the following stand out: [3]

> 0BJ1 To improve the academic integration of new students, addressing their diverse situations.
> OBJ2 To improve the efficiency of acquisition of learning outcomes from students.
> OBJ3 To improve the systems of assessment and qualification.
> 0BJ4 To decrease absenteeism and abandonment.
> 0BJ5 To reinforce the practical orientation of our teachings.
> 0BJ6 To integrate academic training and assessment in transversal competences with preparation in specific competences.
> 0BJ7 To take advantage of new opportunities that Internet provides in order to enrich the educational process.
> 0BJ8 To facilitate alternative means that make learning easier for students enrolled in Plans that are in an extinction phase.
> 0BJ9 Others

The evolution of our country and the alarming levels of unemployment among young people led to a raise in the objectives that were based on improving language skills, business practices, and job entry, providing greater opportunities for our students and "exhausting"  our teachers even more, who are increasingly concerned about students and the fewer resources that are available as a result of project cuts and State guidelines based primarily on the "fact" that "**public officials are responsible for the crisis**", who see their salaries, allowances, bonuses and wage increases systematically reduced, in order to maintain their jobs secure.

In the year 2012, the number of general performance objective is expanded in the context of educational innovation, indicating that the propositions made by professors should be associated with one or more specific actions. The new targets include: [3]

0BJ4 To create resources and to implement initiatives that support the training of students in the acquisition of a B2 level in the English language.

0BJ9 To develop repositories of practices, teaching resources, and activities that facilitate experimentation as well as independent learning.

0BJ10 To facilitate alternative means that make learning easier for students enrolled in Plans that are in an extinction phase.

0JB11 To develop methodologies of monitoring and mentoring of external internships of students and of mobility programs.

0JB12 To favor employment through systems of employment orientations and program to favor the enterprising spirit of students and graduates of UPM.

We should note that in Spain (and in all of Europe) a change in the university education model took place in the year 2010, which has been called "Bologna Process" and encourages and aims to improve teaching and student mobility in a "Single European Space." It only suffices to observe that in the year 2012-2013 we have the same investment levels as in 2006-2007 (Table 1). This is absolutely disheartening, as we have shifted from the "old" Plans to the new space with Higher Education Bachelors and Masters, and the number of degrees at UPM has gone from 22 to 41 bachelors and over 80 enabling and university masters.

Table 1: Financing in Educational Innovation Projects at UPM. Academic years 2005-2006 to 2012-2013.

| | Projects | | Financial funds | |
|---|---|---|---|---|
| | Applied | Granted | Applied | Granted |
| **2005** | 57 | 38 | 231,778 € | 124,791 € |
| **2006** | 121 | 97 | 953,184 € | 600,222 € |
| **2007** | 135 | 118 | 972,355 € | 872,220 € |
| **2008** | 168 | 105 | 1,930,588 € | 858,233 € |
| **2009** | 183 | 108 | 1,607,644 € | 857,907 € |
| **2010** | 217 | 170 | 966,221 € | 795,248 € |
| **2011** | 215 | 212 | 899,023 € | 815,723 € |
| **2012** | 205 | 201 | 651,032 € | 546,692 € |
| **Total** | **1301** | **1049** | **8,211,846 €** | **5,471,036 €** |

Throughout the eight Educational Innovative Projects support calls initiated in the academic years 2005-06 through 2012-13, the overall project funding amounted to €5,471,036. This amount has been distributed among 1,049 approved projects, representing 80.6% of all projects submitted (1,301), and 66.6% of the funding requested (€ 8,211,846) (Table 1). [3]

Looking at the data of the average funding allocated to projects of the last three calls (Table 2 and Figure 1), we observe that the amount of projects decreases along alarming levels. What can be done with 1.500 Euros?

Table 2: Average funding of projects in academic years 2010-2011 through 2012-2013.

| | Average funding of "Center projects" | | |
| | Center coordinated | GIEs Projects | Other projects |
| --- | --- | --- | --- |
| 2012 | 1.905 € | 2.970 € | 1.495 € |
| 2011 | 2.402 € | 4.543 € | 1.786 € |
| 2010 | 3.707 € | 4.297 € | 2.618 € |
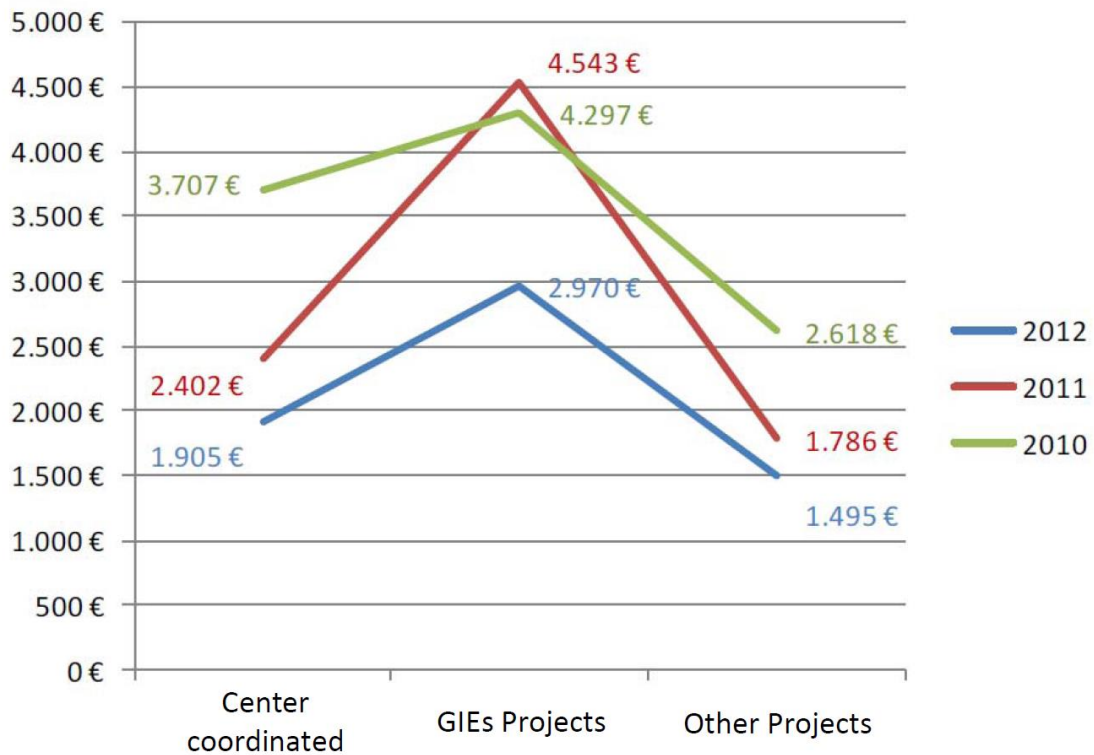


Figure 1: Average funding of projects during academic years 2010-2011 through 2012-2013.

In addition to the amount of our projects, the number of interns has decreased too (Figure 2).
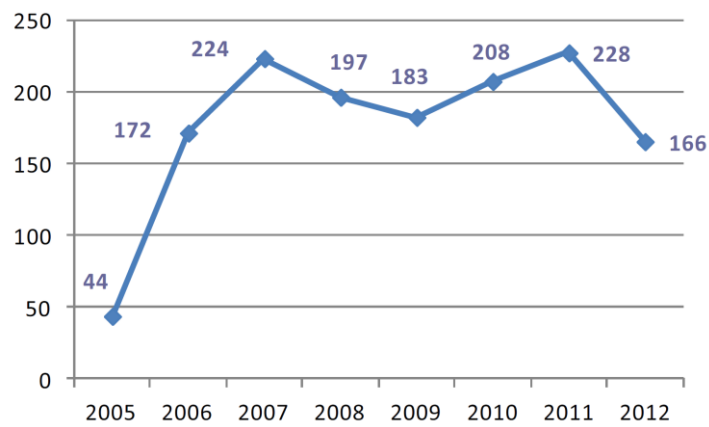


Figure 2: Number of approved interns, by calls.

At this juncture, teaching is almost an "irrelevant" activity; the professional activity is dispensable; and research is the spearhead of accreditation, so the gap separating university teachers is widening.

Nevertheless, the number of professors involved is higher and Educational Innovation Groups (GIE) at UPM have grown (Figure 3), which poses the following questions: Is it curricular engineering? Is there a need for merits in order to gain accreditation? Or is it necessary to show sensitivity to absenteeism, abandonment, and the potential placement of our students? These questions are difficult to answer at any given university forum since responses are masked according to the field, the discussion forum, and the personal situation of the respondent.
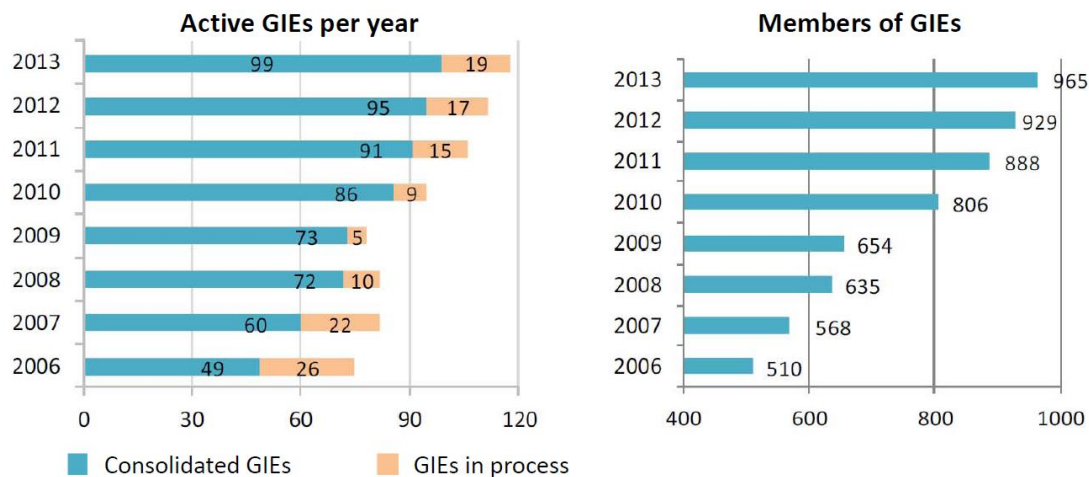


Figure 3: Statistic of GIEs in UPM.

Despite this situation the Technical University of Madrid is still committed to a high level education of our students and has gathered actions along the following strategic lines (Figure 4):



Figure 4: Strategic Lines of the Technical University of Madrid.

The exposition of this series of data clearly shows a changing model of academic curricula and a new profile of professors, having marked scientific tendencies, a decreased technological and professional profile, and no resources to convey their experiences in the field of pedagogy.

And so, a new question arises in our aim to envision a better future for our graduates: Who designs a bridge better, the designer of a technical office that has spent his entire career projecting them or the researcher in finite elements of thermal stress on the board? Who will give a class to students on fertilization better, the doctor who has performed more than 10,000 births or the researching doctor of a laboratory specializing in 37 week's deliveries?

## CONCLUSIONS

During the last eight years the Technical University of Madrid, in its commitment to excellence, has shown interest, concern and continued commitment to improving the quality of education in its schools and curriculum programs of Bachelor and Master.

Educational Innovation Projects developed to date have had a great concern for students; for their abandonment, their absenteeism, their need for improved expression in foreign languages and in practices in business and employment.

The lack of resources due to the dramatic crisis of 2008 – 2014 is causing Educational Innovation Groups, whose assembling and delivery of results takes time, to dissolve or to cease producing.

A country must be based on the three basic components of education: research, career, and teaching. Without these three pillars, stability begins to suffer. The Spanish university has been fundamentally oriented to research. Whether this focus is a mistake in engineering disciplines is not known, but the future will dictate its results.

Educational innovation emerges as a new model of research in the classroom, but the low level of funding and the need to enlarge the curriculum of some professors, is causing it to suffer deeply.

To conclude, we emphasize the "gap" that is developing between three accentuated university teacher profiles: a) the educationalist, professional and enthusiastic professor; b) the technological and technical professor, and c) the research professor.

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**RIGHT BRAIN LESSONS IN A LEFT BRAIN WORLD**

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## Abstract

In many Asian countries, language is taught from a left brain point of view. Students are given lists of words to memorize but not utilize, are taught test-taking strategies but not conversation skills, and are expected to avoid posing questions to or interacting with a teacher. Rather like the old saying, "Water, water everywhere, but not a drop to drink" English surrounds them, but they don't integrate and use it. The researcher has designed several assignments that require students to utilize the language that they have learned and to turn it into real-life for them. From making personal crests to 30 day challenges to bucket lists to storytelling with art, students have been encouraged to utilize their vast L2 vocabularies and make manifest what they know. That is, students are using artistic projects to bring English to life; they are expressing their own desires and interests, are naturally inclined to utilize the language which is most pertinent to their own lives. They are engaged with auditory, visual, and kinaesthetic learning. They tap into their passions... and it just happens to be in English. This paper explores the theory behind the philosophy of using creativity in language learning, presents the accumulated data of student response to a particular project, and gives participants the structure to create their own projects from several options.

**Keywords**: Creativity, Education, ESL, Right Brain

## I. INTRODUCTION

English has been a part of the regular schooling of Korean children since 1997 [1]. Based on The Korea Institute of Curriculum and Evaluation's issuance of the Study on the 7$^{th}$ Curriculum Development [2], the focus was changed from a passive receptive manner of language learning to spontaneous interaction. In practice, however, interaction is not always the result. Students continue to work from a "left brain" perspective, that is, a logical and analytical focus. Spontaneous production, a creative, "right brain" activity, is generally not encouraged. There are several factors that play into this phenomenon. The tendency to study to the test rather than integrate the information, the pervasive hierarchical standards in the society which are based on Confucian philosophy, and social anxiety and fear of losing face, have led to Korean students maintaining their abilities at an intermediate level rather than a deeper understanding of language.

In order to combat this, the researcher has developed several activities that address some of these issues. Based on the students' familiarity with structure, these projects have guidelines which the students are comfortable with but also have several areas in which students can be creative and express themselves in unique ways. These projects run the gamut from lasting a few minutes to several weeks. By having opportunities to express themselves, students are able to utilize more right brain thinking. Please note that for the purpose of this discussion, the definitions of right brain and left brain will be from popular culture's understanding or as a figure of speech to mean that "right brain" is the more creative and artistic part of one's personality while "left brain" refers to the more analytical and logical side [3]. This is not meant to be a discussion from a neurological or biological perspective.

The final section of the paper is dedicated to simple data collected about one long-term project, the use of 30 Day Challenges, and the way this project has been integrated not only in students' lives but also in the lives of the people around them.

## II. LEFT BRAIN FOCUSED

Standardized testing is big business in So. Korea. University students spend about 2 million won (approximately 1,900 USD) [4] per year for private education including to improve English conversation skills and to take proficiency tests. Of those proficiency tests, 2 million Koreans are taking the TOEIC every year [5]. Because there is only one correct answer, and that answer is given to students who simply need to determine which one it is, the multiple choice format is said to encourage a simplistic way of thinking that is not applicable in real-world situations [6]. In fact, with the advent of the No Child Left Behind policy [7], the ability to creatively think has been dropping [8]. This decrease in creative thinking is believed to be due, at least in part, to the increase in standardized testing. Logical, or "left brain" thinking, can be seen as encouraged by the mere prevalence of standardized testing in South Korea.

Students are not encouraged to engage in more creative tasks such as spontaneous production of language; "right brain" activities that are artistic and creative are in fact discouraged by the sheer volume of left brain focus. Korean students' abilities in grammar and vocabulary were found to not be available to them for communicative purposes despite their study time in classes and private academies [9]. Studies suggest that even study abroad programs are not as helpful to students as they could be. In these programs, students were found to ghettoize themselves, spending time in a Korean bubble within the greater English speaking society, choosing not to interact with the language outside of class. That is, they live with other Koreans, and they do not interact with the language except, again, in class. In fact, students simply do not come up with their own interpretations of content that is presented to them [10]. So, in fact, they have a lot of information but simply can't apply it.

The reasons for this rut are also culturally based. Confucian ideals with their preponderance of hierarchical social structure are maintained in the classroom in a number of ways. Students learn by rote memorization rather than creative thinking [11]), they are unwilling to participate in class discussions [12], and are reticent about expressing themselves for fear of losing face or disturbing the social hierarchy [13, 14, 15]. They simply do not practice creative use of language.

Emotional factors such as social anxiety have been found to be an issue for Asian students. The need to not "lose face" which can be understood to be connected with embarrassment is a factor [16]. A number of things can trigger symptoms of embarrassment. In particular, visual stimuli, including the fear of being the center of attention, being watched or observed, meeting other peoples' eyes, etc., can be difficult for these students [17]. They fear being seen and being different. And yet, we know that eye contact is a vital component of conversation [18].

As we can see, cultural and emotional factors, combined with the rampant use of standardized testing underpin student reticence and in fact sabotage the very purpose of language learning – communication. And yet wisdom suggests, and Carl Rogers pointed out quite simply that "Much significant learning is acquired through doing" [19].

## III. RIGHT BRAIN BASED PROJECTS

With the above concerns in mind, the researcher has designed a number of lesson plans that require students to interact with the language in a very real, creative, and sometimes physical manner. All lessons were presented with some level of ambiguity to encourage creative interpretation of the material. Some lessons include art that is presented to the students that is then used as a jumping off place to create something larger while other lessons deconstruct the art that is presented to them. The exercises and the purpose of each one are listed below with short descriptions.

University students were given very clear instructions for each project. Instead of being told to, "Make a list of things you want to do before you die," which was too vague for them, students were told that same thing with the instructions to make certain they come up with at least 25 things, factor in concepts such as career, hobby, family, travel, bettering themselves, and changing the world. They were told to look for some silly things like learning how to juggle and serious things like forgiving someone who had hurt them. They needed to consider both short term goals – like memorizing a poem – and things that would take years such as becoming fluent in a language. By receiving detailed instructions, they were able to unleash their creativity within the structure.

When using timelines, students were encouraged to draw the important moments of their lives or to find a symbol to represent it rather than simply using words. When discussing things like comparatives, students were given postcards of famous paintings and discussed the things they saw there. To teach movie vocabulary, music was played for one minute that suggested a place, and the students were instructed to choose the setting – time and specific place – as well as decide on two characters, their relationship, and the reason they were in that particular setting. Thus, they created a rudimentary plot with conflict and resolution.

From making personal crests to 30 day challenges to bucket lists to storytelling, students have been encouraged to utilize their vast L2 vocabularies and make manifest what they know. Students are using artistic projects to bring English to life. They are expressing their own desires and interests. They are utilizing the language that is most pertinent to their own lives. They are engaged with auditory, visual, and kinaesthetic learning. They are tapping into their passions. And it just happens to be in English.

## IV. 30 DAY CHALLENGES

For several semesters, university students were given the opportunity to do something they had always wanted to do. The idea of 30 day challenges was presented to them via Matt Cutts' TED talk [20] about that topic and his experiences with it. They were instructed to come up with challenges for themselves that were specific, measurable, fun, and could not take more than 30 minutes per day. They were encouraged to try new hobbies, reintegrate something they'd stopped doing, or to try something they'd always wanted to try. Students paired themselves with another student for whom they would be held responsible and were charged with supporting each other in whatever way necessary with common sense and the honor system applied.

The first two semesters that this was taught included several students who stopped smoking as well as tried vegetarianism for the duration of the project. Many students did artistic projects like practicing Chinese calligraphy, playing musical instruments, and learning photography. Another popular focus was health related challenges such as exercising, increasing water intake, decreasing junk food intake, and cooking healthy meals. Some students chose to interact with other people or animals. One student chose to feed the feral neighbourhood cats while another one took photos of her husband each day. At the end of the 30 day period, students reported doing things like running 5K races, joining bands, and having art exhibits as natural outgrowths of their projects as well as more abstract outcomes such as increased self-confidence, and belief in their ability to affect the world.

A surprising side effect was that many other people became involved in the projects – sometimes unknowingly. Roommates began to make suggestions, parents started walking after dinner with their children, sweethearts began cooking together. The most emotional experience was a student who told his mother every day, "I love you." Within a few days, his father asked why he was doing that and not saying, "I love you," to him. So the student began telling both parents. Then his brother asked, "What about me?" Soon the entire family was telling each other, "I love you," on a

daily basis. The student wrote in his report how powerful the experience was and how his family had changed.

The third semester of this project, preliminary data was collected.  Questionnaires were given to 82 students in intermediate Practical English classes after they had completed 30 day challenges.  Of this number, 2 of the questionnaires were eliminated due to lack of responses.  For the purposes of this paper, n=80.

The students were asked several questions:  What was your challenge?  Who helped you with your challenge?  What are some future challenges that you might like to try (up to 3 response lines were given)

The challenges again fell into several categories:  Health and Wellness, Art, Academic, and Inter / Intrapersonal.

Health and Wellness challenges were completed by 35 students. These included adding exercise to their lives, changing their eating and drinking habits, stopping smoking, cleaning their rooms, and practicing relaxation techniques such as yoga or meditation.

Art was also a popular choice, both active and passive.  Of the 80 students, 19 chose active art, that is, practicing a hobby like learning to play the ukulele or bongos, sketching animals or dancing.  Four chose passive artistic pursuits such as listening to a particular kind of music.

A few students (12) completed challenges with a more academic bent like reading newspapers and magazines such as The Economist, the New York Times, or the local newspaper.  Three of these students combined the academic – practicing a language – with fun by choosing challenges to watch one English language television show daily or to read a comic book written in the secondary language the student was studying.

The final category that was chosen by students included intra- or interpersonal communication. Students chose to maintain connections with family or friends by daily speaking by phone (3) or by writing letters (2).  Five others chose more personal writing such as journaling, fiction or poetry writing.

Students were asked who helped them in their challenge and were given space to write up to three different people.  The greatest majority of students stated that their friends (50), class partners (42), and parents (36) had helped them.  Roommates (14), siblings (7), and teachers (4) were also noted as helpers.  Six students reported other people in their lives while only two students stated that no one had helped them.

Students were asked if they thought the challenge was useful to them.  All the students said yes but for different reasons (confidence, taking control of their lives, learning new things).  The final question asked was to contemplate and list any future challenges they might be interested in doing. It was suggested that the students list several choices.  Of these, the categories again fell into Health and Wellness (104), Art (70), Academic (32), and Intra / Interpersonal (36).


**Conclusion**

While Korean students have difficulty with moving beyond their education's left brain, Confucius-driven roots, there are ways to introduce more right brain, creative activities to them.  By combining structured guidelines to creative projects, even students with a strong history of learning via a teacher-oriented method can flex their creativity muscles when they are put in specific circumstances to do so.  By modeling the use of art and then supporting and encouraging students to use their own creativity, language instructors can help break the cycle of poor production skills and give students opportunities to utilize their knowledge in more real life scenarios.  Exercises can

be created and adapted that introduce not only specific grammar, pronunciation, or vocabulary points, but that also support productive skills in the classroom. Several examples of lessons, utilizing a multitude of mediums, are listed at the end of this paper.

## V. LESSONS

### 1. Past Perfect Tense Exercise:  Draw the plot of the song

Students listen to the song Church by Lyle Lovett [21] and deconstruct the plot of the story in the song.  Each student is then given one piece of the story to draw.  The drawings are then put on the wall in a timeline fashion.  After the grammar is taught, students can make sentences using past perfect while visualizing the time pattern which is paramount in understanding the grammar.

### 2. /l/ and /r/ Pronunciation Exercise:  Poetry Pronunciation

Students are taught a short lesson on the mechanics of creating /l/ and /r/ and then use the poem Oh My Love is Like a Red, Red Rose which is credited to Robert Burns [22] as a method to practice the different sounds.

*an added exercise is to have students write and illustrate what love is like for them.

### 3. Past tense Exercise:  Match item with the place

Students are put in small groups and given a postcard or photograph in which something could be hidden in the picture. For example, images of doors, baskets, boats, jars, etc. are useful for this. Students are encouraged to imagine items that are the right size to be hidden in the different places. Students then can write paragraphs or story plots using past tense verbs to express who hid the item, when was it put there, etc.

### 4.  Movie Vocabulary Exercise: Storytelling Elements using Music

Students write headings at the top of their paper: People / Relationship; Where are they? / What are they doing? One minute of music from a number of different genres is played, and the students answer the questions for each piece.

n.b. It's helpful to have songs without many English words or with words from a language the students don't know so they can focus on the emotions and interpretations. Music names should not be made available to the students until after the meditation.

### 5.  Compare and Contrast Exercise:  Video Analysis

Students are shown 3 videos from a New York Times Magazine series that is touted as "Performers who defined cinema in 2010 capture classic screen types." The students watch several of the videos – in particular those of Javier Bardem, Matt Damon, and Chloe Maretz [23, 24, 25] to discuss how very different "upset" can look.  The three videos show several different methods of expressing the same emotion.  They can then work together to create lists comparing and contrasting the ways the different actors expressed themselves.

### 6.  Public Speaking Exercise: Presentation with Personal Art Work

Students make an art project that represents the most important things in their lives.  The guidelines do not specify what type of art they can use, and their projects have run the gamut in the types of

mediums used.  They've painted, sculpted, created visual media, written and performed songs, made mobiles and books and stained glass and face masks and even food.

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# BARRIERS TO ICT UTILIZATION IN BASIC EDUCATION IN NIGERIA

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## Abstract

In this twenty first century, information and communication technologies have taken the center stage in all human affairs, and Nigeria is already taking giant strides towards integrating ICTs in its education system; this is evident by the number of Information Technology policies, provision of facilities, capacity building efforts and infrastructural development that are in place. However, despite government effort to ensure the inclusiveness of ICT at all levels of the educational system in the country, sadly, certain factors stand as impediments to both integration and utilization of ICTs for instructional purpose, these factors range from school curriculum, administrative, technical, infrastructural and teacher-related factors. The Teacher-factors are the central focus of this discussion, these teacher specific factors are; teacher attitude, initial training, technophobia syndrome and lack of appropriate ICT competencies. This paper, using available secondary sources of information provides significant evidences of how teacher factors contribute to non-utilization of ICTs in basic education classrooms. The paper also highlights some strategies to surmount the barriers imposed by teachers in using ICTs to teach in basic education classrooms, through correct implementation of all ICT policies, constant training and retraining of teachers to develop competencies in the use of ICTs for pedagogical renewal. The paper further recommends that, teacher training institutions i.e. colleges of education(COEs) and university institutes and faculties of education in the country should redesign and reorganize teacher education programmes (pre-service and in-service) to reflect the present need in this technology-driven society i.e. training should be tailored towards the use of educational technologies and procedures in the classrooms.

**Keywords:** Barriers, basic education, information and communication technologies, teacher factors

## INTRODUCTION

Education is since regarded as a dependable tool which can be used to confront the challenges of our complex global society, therefore the quality and relevance of the kind of education provided to any people determines their preparedness to face the challenges of the 21$^{st}$ century. Throughout the world, the challenge for school system is that of providing an effective education for all children and young people which will prepare them for work and participation in all spheres of human society as well as for global competitiveness. Nigeria introduced the 9-year Basic Education Programme for the attainment of the millennium development goals (MDGs) and other national development strategies using education as a vehicle. Nigeria has an estimated population of about one hundred and fifty two million people, of which 45 percent are children of school age i.e.5-11 years old, these children require basic education to for lifelong learning. No doubt, information and communication technology has made impact in all aspects of life. Many countries have experienced drastic changes in their environment especially in the education sector, through the use of information technology. In spite of the positive impact of ICT on human society and the role of education in facilitating this impact, most developing countries like Nigeria are yet to effectively incorporate the use of ICT into the educational system. However this is not to conclude that Nigeria has not made any significant effort to exploit information technologies for its development. As a matter of fact, Nigeria is collaborating with many countries of the world in ensuring that, ICT utilization has become an established culture in the society. This is evident in the various developmental strategies initiated by

the various tiers of government in Nigeria, where ICTs are given the much desired priority. ICTs are integrated at all levels of the county's educational system. Several Information Technology policies and curricula have been developed and are in use at different levels of education in the country. The teacher education programme also received its own share of the ICT revolution in Nigeria. This is evident in the provisions of a new teacher education curriculum for production of Nigeria Certificate in Education (NCE) teachers. The new NCE curriculum is tailored towards production of ICT literate teaches for effective content delivery in the 21$^{st}$ century classroom based on the changing needs of the global society. This is necessary because, how teachers do their teaching influence how learners learn, therefore, certain teacher-related factors normally exert significant influence on students learning. Sadly, these factors are found to impede the use of ICTs in Basic Education classrooms in Nigeria. This paper seeks to highlight teacher-related factors preventing effective and efficient use of ICT in Nigeria's' basic education system and the steps to be taken to improve the usage of ICTs in Basic Education classrooms.

## UNIVERSAL BASIC EDUCATION PROGRAMME IN NIGERIA

The Universal Basic Education (UBE) is an educational reform programme of the Federal Government of Nigeria which was introduced to facilitate the achievement of free, compulsory and universal education in nine years for all school age children irrespective of their socio-economic circumstance (Federal Government of Nigeria, FGN, 2006). It is important to note that, the philosophy behind Basic Education in Nigeria is to provide opportunity for every learner who has successfully completed the nine years of continuous Basic Education schooling, should have acquired sufficient level of literacy, numeracy, manipulative, communicative and life-long skills as well as ethical, moral and civic values needed for laying a solid foundation for life-long learning as a basis for scientific and reflective thinking. The basic education curriculum is structured into three levels of operation namely; lower basic education curriculum (primary 1-3), middle basic education curriculum (primary 4-6) and upper basic education curriculum (JS1-3). Both the national policy on education and the national policy on information and communication technologies (ICT) in education have clearly stated the position of government on the place and role of ICTs in education, which is expected to guide and propel teachers to apply ICTs in the basic education classrooms. It is pertinent to note that, the current state of primary schools in Nigeria is not favourable for the attainment of the set objectives for the basic education. Although there are clear evidences of infrastructural improvement and increased access to at all levels of education in Nigeria with the introduction of universal basic education programme (UBE), much is still desired, because instructional resources including teaching manpower is still grossly inadequate with untrained personnel, non-availability of computers, computer laboratories and other ICT facilities like electricity and internet connectivity in most public primary schools in Nigeria.

Even the national policy on ICT in education in Nigeria document (FME, 2010) noted that, the present state of ICT in education in Nigeria is far from what it is expected to be, therefore, this call for the need to fully integrate ICT into education in the country. The present trend hampers the attainment of the policy provisions for the education system in Nigeria. Olagunju, (2014) Observed that, the 9 year Basic Education Curriculum is quite different from the old curriculum, because new subjects such as computer studies/ICT, civic education and French have been introduced to close the gaps in the old curriculum. Core subjects such as Basic science and Basic technology have been redefined to fit into the new paradigm. The arrangement of the new curriculum content is thematic and spiral starting from primary to secondary school level.

## ICTs IN THE BASIC EDUCATION SYSTEM IN NIGERIA

Technology is a critical component of education in the 21st century because; the ability to use computers effectively has become an essential part of everyone's education and is a determinant of the growth and progress of any society, Adomi&Akpangban, (2010). Nigeria having realized the crucial role of ICTs to general development; in this regard, came up with relevant policies such as the

National Information Technology Policy, National Information Technology Framework, and National policy on Education, National Economic Empowerment and Development Strategy as well as Subsidy Re-investment and Empowerment Programme etc. The pervasion of ICTs in all segments of the global society also played a significant influence on education and particularly in teaching and learning environments. Teachers' role, pedagogy, assessment and administration of education are changing. New teaching-learning paradigms are replacing old ones with changes in view of the learning processes. New classroom concepts have emerged, thereby giving new meaning to education, teaching and learning as concepts. It is no exaggeration to mention that, the role an responsibilities of both teachers and learners are changing in the classroom. There is a major shift in the instructional process too. Considering the above major changes taking place in the classroom as a result of technology, the basic education Teacher in Nigeria have no option than to follow the wind of change which will bring about the desired, progress from education. In this regard, high expectations are placed on teachers due to new roles, responsibilities and challenges in the classroom. In Nigeria, The Basic Education Curriculum provides for computer studies/ICT as compulsory subject to be offered by all pupils and students in all the three levels of basic education in Nigeria. This indicate governments' commitment to ICT integration in education .This also show that, teachers at this level are expected to possess both knowledge and skills to use computers and other ICT tools for instructional delivery in the classroom. Hooker, Mwiyeria, and Verma,(2011) reported that, there is low availability of ICT  infrastructure and manpower requirement in the basic education system in Nigeria, but despite the challenge, government still made commitment in the sector by introducing ICT into the basic education curriculum.

## TEACHER COMPETENCY IN THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES

The role of the teacher at the basic level of learning is very critical because, it is at the early stage of basic education that attitudes and self-image of the learners are formed. Therefore the competency of teachers at this level cannot be ignored or compromised. ICTs are now indispensible tools for content and curriculum delivery in the classroom. Similarly, while teaching and learning conditions are important, teachers are central to the question of education quality and relevance. However, the way teachers are prepared and trained for their profession is a critical indicator of the kind of educational quality and its relevance to the society. At this juncture, we may pause to ask*;* Are the Basic Education Teachers adequately prepared to effectively implement the Basic Education Curriculum in Nigeria?
 This question is quite relevant and timely in view of the current global changes and challenges which have given birth to paradigm shift in the field of education and particularly in the classroom where teachers operate. There are several study reports on barriers to technology use (Marshall, 2000,Elgort, Marshall and Mitchell, 2003).for example, a study of academic staff attitude and manner of approach to the use of technology has  discovered time factor and a lack of knowledge and skills to use technology  as major obstacles to technology implementation in schools (Marshall, 2000).

As earlier stated the quality of learners and learning is measured by the quality of teachers and teaching. This imply that, teachers' role is critically important, because teacher plays a crucial role of guiding learners and facilitating learning, if this is what is expected of a teacher, how then do teachers become impediments to use of ICTs in the classroom?.This is revealed from close interactions with fifty(50) teachers, engaged in teaching at the three levels of basic education in Zamfara state, Northwest region of Nigeria, The close interactions with the teachers was possible due to six month teacher cluster meetings and mentoring sessions held between November 2013 to April, 2014.The result of the interactions clearly show that, majority of the teachers do not use ICTs for classroom instruction, for assessment or record keeping in school. Similarly, Reports from the Zamfara state Universal Basic Education Board (ZSUBEB) which is the Agency responsible for the

implementation of Basic Education Policies also indicate low rate of teacher engagement with ICTs for instructional purpose in primary and secondary schools in the state. The above scenario is attributed to several factors ranging from curriculum, administration, and technical issues, Teacher factors, Infrastructure and system failure. The argument of this paper is, since teacher's role is critical to curriculum implementation, then, it is imperative to look at how teacher characteristics affect the use of modern ICT tools in the classroom rather than focusing on other factors that have no direct influence on learners and learning.

**TEACHERS AS BARRIER TO ICT USE IN THE CLASSROOM**
Specific teacher personal characteristics have significant influence on learners and learning. These characteristics can be regarded as factors that facilitate or ruin instruction in the classroom. Some of these teacher-related factors are hereby highlighted to substantiate the argument of this paper.

Teacher's Attitude: Majority of teachers implementing the Basic Education Curriculum had their initial training with the old teacher education curriculum which does not provide for ICT knowledge and skills to teachers. This category of teachers sees ICTs in education as alien. They do not appreciate the need for technology application in the classroom, since they lack skills to operate the tools for instructional purpose. In view of this, they develop apprehensive attitude to use of technology in the classroom. They simply view it as an attempt to test their abilities and not as an aid for teaching. These poor attitudes of teachers impede the use of ICTs in the classroom.

Teacher's initial training: In Nigeria, entrants into the teaching profession normally undergo an initial preparation in colleges of education, institutes and faculties of education in universities to obtain specialized knowledge, skills and methodology required for teaching. Unfortunately, in all these channels for initial training of teachers, the use of computers/ICTs is not given any precedence; hence teachers are incapacitated to use ICTs at workplace even after graduating from colleges and universities, because ICT devices were never used in teaching them while on training.

Teacher technophobia: it was found that, most teachers have limited interaction with computers and other forms of information and communication technologies right from the training stage. This is confirmed by Idris, (2013) who reported that, majority of college and university students in Nigeria are not ICT literate and do not even have e-mails. Consequent to the above, such students after graduation develop phobia (fair) for technology tools at work place. This is the situation with most teachers at the Basic Education level in Nigeria. The fair for failure in setting up Technology devices and the eminent embarrassments it may cause them makes teachers to shy away from the use of ICTs in the classroom, thereby limiting the drive for ICT integration and utilization in education.

Teacher ICT competence: Teachers who implement the Basic Education curriculum in Nigeria are highly deficient in general ICT competencies, thereby making them incapable to use them for instructional processes. A Survey carried out on ICT competency standard for Teachers framework in Nigeria indicate low availability of infrastructure in the basic education system and poor teacher perception on use of ICTs in education. Similarly, a study conducted by Adomi & Kpangban, (2010) on rate of ICT adoption and application in Nigerian secondary schools, identified several factors as causes of low level of ICT application in schools. They reported these as some of the significant causes; inadequate ICT manpower in the school, lack of/ limited ICT skill among teachers, lack of/poor perception of teachers and administrator on the role of ICT, Poor ICT policy/project implementation strategy. In the same vein, Adeosun, (2010) presents the following findings as evidences of teacher perception of ICTs

Table 1: Teacher's Perception of ICT (Adopted from Adeosun, 2010)

| CONSTRUCT | AGREE (100%) | DISAGREE (100%) | Not Applicable (%) |
|---|---|---|---|
| I am active in the use of ICT in the classroom. | 21.7 | 13.6 | 56.3 |
| I make allowance for ICT use | 13.5 | 17.8 | 57.9 |
| I consider ICT useful for learning. | 9.1 | 26.2 | 58.9 |
| Students can use computers at home if they so wish | 14.2 | 25.6 | 55.0 |
| ICT is not relevant to teaching | 9.1 | 27.8 | 57.6 |
| I use ICT only for personal purpose | 26.6 | 9.1 | 58.9 |
| I use ICT for professional purpose | 21.7 | 12.0 | 59.9 |
| I do not feel threatened with the use of ICT | 10.7 | 24.3 | 57.6 |
| I feel inadequate in the use of ICT | 20.4 | 17.8 | 57.0 |
| I seek out ideas about ICT always | 20.4 | 13.9 | 57.0 |
| I always try out some learning activities with ICT | 26.5 | 10.4 | 56.3 |
| I use ICT based on the recommendation of another teacher | 10.7 | 21.0 | 60.8 |
| I depend on other teachers to use ICT | 12.3 | 20.1 | 60.2 |
| I encourage my students to use ICT | 24.3 | 7.8 | 61.2 |
| ICT is an enhancement to my classroom | 23.9 | 8.1 | 60.2 |
| ICT is critical to learning achievement | 24.3 | 8.7 | 60.5 |
| I make efforts to upgrade my computer skills | 24.9 | 10.4 | 59.2 |
| I am a major contributor to ICT development in my school | 16.2 | 13.9 | 60.2 |
| I am incapable of operating ICT tools independently | 18.1 | 17.5 | 58.9 |

From the analyses presented in the table above, it can be deduced that, lack of skilled competent teachers stand out as a significant factor militating against the use of ICTs in our schools.

**STRATEGIES TO SURMOUNT BARRIERS TO ICT USE IN THE CLASSROOM**
Information and communication technologies have come to stay, and will continue to influence every affair of the human society. Therefore, whatever factor that may present itself as an impediment to utilization of ICTs in the society must be strongly resisted with minimum delay. It is obvious that the present teaching manpower implementing the Basic Education Curriculum in Nigeria is weak and incapable of meeting the desired policy goals. It is therefore necessary to employ strategies that will adequately address these problems. This paper seeks to present some effective strategies to surmount barriers to use of ICTs in the classroom.

1. Special capacity building workshops/seminars that provide hands-on and minds-on opportunities for all participants should be organized for In-service teachers in primary and secondary schools to build capacity at the Basic education level. The central focus of the workshop should be practical application of ICTs in the classroom. In the same vein, talks, shows and discussions should be incorporated in the seminars to change the attitudes and mindset of in-service teachers about ICTs in teaching.

2. Policy and curriculum provisions backed by infrastructural supplies for use of technologies to train teachers should be a matter of priority in teacher training colleges, institutes and faculties of education in the universities. This implies that, lecturers should be mandated to employ the use of technology devices for instructional process in training teachers.

3. The application of Educational Technologies in microteaching and teaching practice at the initial teacher preparation stage should be an essential requirement for pre-service teachers.

Teacher trainees should be given ample opportunities to practice teaching with ICTs in form of Microteaching several times before graduating to enter into the teaching profession.

4. If teachers are to imbibe the culture of technology use in their life endeavours, then, they need to have easy access to ICT devices, therefore deliberate and dependable efforts must be made to provide access for teachers to use ICTs every day in and out of workplace. Laptop computers mobile, devices and other forms of E-learning tools should be made available to teachers at the Basic Education levels in Nigeria.

## RECOMMENDATION

In view of the important role of teachers in the classroom and the significant influence they bring to bear on the life of learners, the paper hereby presents the following recommendations to education stakeholders in Nigeria. Government should introduce subsidy to ICT in education as it applies to petroleum products in Nigeria so as to encourage and empower both teachers and students to use ICTs for educational purposes. Government should improve funding of ICT in education projects. However, to avoid overdependence on government, Public-Private partnership should be encouraged for effective provision of ICT infrastructure in schools. Ample time should be allotted on the school time table to allow for the practical application of ICTs in the classroom. The national policy on information and communication technology in education thrust should be well implemented beyond mere policy statement. Basic education teachers should make personal effort to acquaint themselves with modern information and communication technologies as tools for instruction.

## CONCLUSION

Teachers are critical to every education system and by extension to national development, As a matter of fact, the quality and relevance of the kind of education provided to any people determines how prepared they are to face the challenges of this current century, because no nation can rise above the quality of its education; Hence, the competences of our teachers have direct bearing on the learners and consequently the whole society. Teaching and learning in most schools in Nigeria is still dependent on traditional methods, which are incapable of meeting the needs of the present day learner. Old methods of teaching are still in use for classroom instructional processes in primary and secondary schools (Basic education level) in Nigeria. The basic education curriculum is being implemented by teachers who do not possess the prerequisite teaching qualifications or even the basic ICT skills to operate in the classroom. Therefore, there is the need to re-organize our teacher education programme to be tailored towards production of ICT literate teachers that will work with new information and communication technology tools/devices to surmount current classroom challenges in education for effective teaching in the basic education level.

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# REPOSITIONING NATIONAL TEACHERS' INSTITUTE IN NIGERIA FOR OPTIMUM OPEN DISTANCE LEARNING SERVICE:  CHALLENGES AND PROSPECTS

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## Abstract

The Nigerian national policy on education has over the years recognized the place of open and distance learning in achieving lifelong education and affirms that lifelong education shall be the basis of the nation's education policy. Further, the policy states that at any stage of the educational process after junior secondary education, an individual shall be able to choose from either continuing full-time studies, combining work with study, or embarking on full time employment without excluding the prospect of resuming studies later. A critical appraisal of the scope of open and distance learning practice at any level of education in Nigeria against the backdrop of the long-standing recognition of its potential for increasing access to education for all socio-cultural groups, unfortunately, reveals a glaring mismatch between policy and practice. The National Teachers' Institute (NTI) was setup in 1976 to serve as a Distant Learning Educational Institution in order to provide additional means of tackling the challenges facing Teacher Education in Nigeria. Also, through its most recent annual nation-wide MDG workshops, it has retrained over 800,000 teachers since 2006. The Institute has successfully trained a number of teachers in various programmes while many others are presently on. Six degree progammes are to start by January 2015 while more programmes will be introduced as the Institute progresses. Its plan is to also establish School of Educational Innovation and a National Centre for Teaching of English in 2015. The demands of these initiatives are high. This paper recommends that concerted efforts that would bring about improved finances leading to full on-line operations, expanding the band width of the website and radio station is urgently needed. It might be necessary to invite external observers/quality assurance assessors with a view to using their comments to rate NTI programme internationally. This is expected to be the beginning of wooing foreign students from far and near for her ODL programmes. It is envisaged that such inspection would be necessary only when the degree programmes have taken off successfully.

**Keywords:** Open and distance learning, National Teachers Institute (NTI), open educational resources (OERs), teacher training, prospects and challenges in teacher training.

## Introduction

Nigeria as a nation is organised into 36 states and a federal capital territory (FCT) in Abuja and has a population of about 175 million people as at July 2013 (http://www.indexmundi.com/nigeria/ demographics_profile.html). As a result of the oil boom years of the 1970s, tertiary education was expanded to reach every sub-region of Nigeria. The federal government and the state governments were previously the only bodies licensed to operate universities. Recently, licenses have been granted to individuals, corporate and religious bodies to establish private universities in the country. The National Universities Commission (NUC) is the major accreditation body that enforces uniform standard and sets admissions capacity of every university in Nigeria. Today the nation can boast of over 112 universities yet admission is a problem for those transiting from secondary school because of the huge population and exposure to western education.

Difficulty in securing admission appears to be worse for those in education line. Efforts made to resolve this resulted in licenses being granted to some colleges of education in the nation to offer degrees in education related disciplines. In spite of these steps, there is a category of people that are not adequately catered for. These are the poor and some workers that their employers have no

provision for their advancement and those who cannot risk resigning their appointments as they have obligation to cater for their families. This group prefer sandwich, part time, evening and open and distance learning (ODL) programmes. At a point in Nigeria all existing universities saw this as a means of boosting their income and so it was abused and the federal government through the NUC stopped the universities and then gave out guidelines for registration for those that desire to run such programmes. This strict policy has introduced some level of inadequacy and quest for quality which ODL seeks to fill.

The Nigerian national policy on education has over the years recognized the place of open and distance learning in achieving lifelong education and affirms that lifelong education shall be the basis of the nation's education policy. It went further to state that at any stage of the educational process after junior secondary education, an individual shall be able to choose between continuing full-time studies, combining work with study, or embarking on full time employment without excluding the prospect of resuming studies later. According to the policy document, the goals of open and distance education are to:
1. Provide access to quality education and equity in educational opportunities for those who otherwise would have been denied.
2. Meet special needs of employers by mounting special certificate courses for their employees at their work place.
3. Encourage internationalization especially of tertiary education curricula.
4. Ameliorate the effect of internal and external brain drain in tertiary institutions by utilizing experts as teachers regardless of their locations or places of work (FME, 2008).
    However, a critical appraisal of the scope of open and distance learning practice at any level of education in Nigeria against the backdrop of the long-standing recognition of its potential for increasing access to education for all socio-cultural groups, unfortunately, reveals a glaring mismatch between policy and practice even in the face of obvious and widely acknowledged perennial inadequacies of the conventional face-to-face mode, in meeting the higher educational aspirations of a large number of Nigerians, especially in the university sub-sector. This was further stressed by NUC (nd) that in order to bring the Practice of distance learning up to speed with global practice, it is incumbent on NUC as the statutory quality assurance agency in the Nigerian university system, to streamline the practice of distance learning by stipulating a code of good practice. Such a document should clearly enunciate performance standards pertaining to the entire gamut of teaching and learning by the ODL mode including learner support which is a critical success factor in open and distance learning. In response to this and many other challenges, the National Teachers' Institute (NTI) was set up.

The National Teachers' Institute was setup to serve as a Distant Learning Educational Institution in order to provide additional means of tackling the challenges facing Teacher Education in Nigeria. The challenges include:
1. The need to truly profesionalise the teaching profession at all levels
2. The need to curb the worrisome shortages of professional Teachers nation-wide
3. The need to provide serving teachers the opportunity to further, upgrade / update their qualification and professional competence without necessarily leaving their jobs
4. Finally, the need to provide all  the above at minimum costs to both the students and the education authorities (www.ntinigeria.org)

Today NTI has become more focused and as such made significant progress though still facing some challenges. The NTI has for a long time focused on production of sub-degree certificates in education through ODL such as Nigeria Certificate in Education (NCE), Post Graduate Diploma in Education (PGDE), Advance Diploma in Education (ADE), Pivotal Teachers Training Progammes (PTTP) among

others. At present, plans are in place to start degree programmes in education through ODL especially in English, Mathematics, Social Studies, Primary Education, Integrated Science and Physical and Health Education. The worry at the moment is how to reposition the Institute with a view to overcoming all huddles and extend services to neighbouring African countries who by virtue of closeness or search for quality ODL may find the Institute fitting for such purpose.

**Situation Analysis and the Expectations**

The reality in the Nigerian university system is that there is the need to distinguish between open learning and distance education. True openness especially in terms of entry requirement is to be considered a longer –term objective against the backdrop of the reality in the nation's university education scenario which is characterized by perennial mismatch between the demand and supply side of the access equation. The current situation is that there are thousands of young qualified candidates seeking university admission who cannot be absorbed into the nation's universities. An analysis of the state of ODL in the Nigerian university system reveals that:

1. The National Open University of Nigeria (NOUN) is currently the only Uni-mode University mandated for Open and Distance Learning in the delivery of university education.
2. There are about six universities which may be regarded as dual- mode universities with limited capacity to deliver degree programmes by the open and distance learning (ODL) in addition to the conventional face-to face mode
3. All stakeholders agree that the practice of distance learning by these dual mode universities is far below acceptable best practice and that at best, they are in transition from the running of part-time/ sandwich courses to distance learning (NUC, nd)

It was stipulated that for all academic programmes to be taught by ODL, interactive texts shall be at the heart of teaching and learning. These shall be supplemented with other resources such as CDROM, DVD or USB sticks to deliver; e-books, simulations, assessment, etc. ODL means that students should not be required to attend classes or have face-to-face contact, unless there are compelling reasons to justify it such as examinations, periodic facilitation and practicum. In terms of delivery, it is emphasized that:

1. ODL programmes shall be predicated on a pedagogy that is led by resources and not reliant on face-to-face intervention
2. students should be able to register to study anywhere in Nigeria or any part of the world with a common standard of service at any study centre
3. The study centre system should offer both academic and social support. Study centres should act as the focal points of learning communities and have agreed standards of accommodation in facilities and equipment.
4. Collaboration between providers, e.g. in 'university centres' will offer a cost effective means of providing study centres.
5. Students should be expected to be able to have access to ICT to assist their learning. For specific programmes, functional internet access would be required for all study centres
6. Assessment will include continuous assessment (a minimum of one marked assignment for each 40 hours of study ) as well as summative assessment, e.g. exams , portfolios, that provide for validation of achievement
7. It is expected that assessment tasks will occupy a minimum of 10% of study time. The course score should depend on both the continuous and final assessments.
8. Effective marking and feedback require rapid return – a target maximum of 3 weeks is appropriate but ICT may allow this to be reduced. Such standards will be necessary to ensure ODL awards have a high reputation.
9. Loading on staff may be reduced by the use of automatically marked ICT based Assignments (NUC, nd).

With these expectations, Open University of Nigeria (NOUN) has been in the lead to provide university degrees in education and other disciplines through ODL. The NTI hitherto has focused on production of sub-degree certificates in education through the same ODL such as Nigeria Certificate in Education (NCE), Post Graduate Diploma in Education (PGDE), Advanced Diploma in Education (ADE) and Pivotal Teacher Training Programme (PTTP). Though much success has been recorded in this aspect, there is need to venture further by introducing degree programmes in education but not without challenges. If those who were ahead in ODL had some challenges, NTI needs to be aware for the purpose of developing strategies for combating such challenges.

**Challenges**

So many things constitute challenge to ODL students in Nigeria and prominent among them is cost generally. In their longitudinal study of graduating high school seniors, Provasnik and Planty (2008) found that individuals from lower socioeconomic statuses were more likely to postpone college enrollment, and that those who did enroll in college were more prone to choose a community college than their wealthier peers. Another study found that over half of community college students (55%) are from the two lowest income quartiles compared with 38% of public 4-year students (Bailey, Jenkins, & Leinbach, 2005). But Buczynski notes,

> Faculty cannot teach successfully in classroom environments, whether face to face or online, with increasing numbers of students who do not have access to required readings and other learning materials. There is a gap between the business models employed by textbook publishers and student expectations for access (2007, p. 174).

One way that this gap can be bridged is through the utilization of open educational resources (OER). Hilton, Robinson, Wiley and Ackerman (2014) found that open educational resources have a large potential to save students, as well as the parents and taxpayers who support them through grants and loans, significant amount of money. It was found that broad adoption of OER reduces educational cost for every students impacted. It was estimated that total savings in US was approximately $1b per year. Adeyanju (2014b) remarked that NTI teacher education materials in Nigeria are used both by its candidates and conventional tertiary institutions. He was of the view that in no distant future, some of NTI materials will be released as OERs.

Despite the potential benefits offered by OER, the use of these resources in many Higher Educational Institutions in Sub-Saharan countries is very low (Freitas, 2012; Hoosen, 2012). MIT OCW statistics show that only 2% of users have come from Sub-Saharan countries since 2004 (MIT, 2013). Likewise, in the past two years, almost 2 million users who accessed OER Africa resources were from South America, North America, Europe, and India (Richards, 2013). According to Hoosen (2012), the majority of institutions in Tanzania are not active in OER initiatives. For example, in a study conducted by Samzugi and Mwinyimbegu (2013) at the Open University of Tanzania (OUT), only 21.8% of 150 respondents indicated that they had heard about OER agreement with MIT a few years ago. Clearly, the perceived benefits of OER cannot be realized if academics in higher education do not use them, they remarked.

A considerable amount of literature has been published to explain factors that hinder the use of OER and effectiveness of ODL in Sub-Saharan countries. Generally, studies have consistently described the shortage of computers and Internet and low Internet bandwidth as the main contextual barriers to the use of OER in Africa (Hatakka, 2009; Hodgkinson-Williams, 2010; Hoosen, 2012; Larson & Murray, 2008; Wilson-Strydom, 2009). Other main barriers cited are summarized in Table 2. Table 2 summarizes some of these perceived barriers to the use of OER/ODL in Sub-Saharan Africa.

Table 2

Perceived barriers to the use of OER/ODL in Sub-Saharan Africa.

| Barriers to Use of OER | Description | Source |
|---|---|---|
| Technology | • Lack of access to computers and the Internet<br>• Low internet bandwidth<br>• Uninterrupted power | (Hatakka, 2009; Hodgkinson-Williams, 2010; Hoosen, 2012; Larson & Murray, 2008; Wilson-Strydom, 2009. |
| Legal | • Lack of awareness amongst instructors regarding copyright and IPR issues | (Hoosen, 2012; Hylén, 2006; Yuan et al., 2008) |
| Institutional and national policies | • Lack of policies at institutional/national/regional level to support the creation or use of OER | (Yuan et al., 2008) |
| Relevance | • Lack of resources appropriate to local context | (OECD, 2007) |
| Social | • Lack of skills to select appropriate OER and re-use or re-mix it<br>• Unwillingness to use resources produced by someone else<br>• Do not trust the quality of OER<br>• Lack of time devoted to produce shareable materials<br>• Lack of incentives or reward systems for instructors | (Hodgkinson-Williams, 2010; Hylén, 2006; Larson & Murray, 2008; OECD, 2007; Yuan et al., 2008) |

**Source:** Mtebe and Raisamo (2014)

**Prospects and Strategies for Repositioning NTI for Optimum ODL Service**

NTI has made significant efforts in the area of Quality Assurance Mechanism. One inherent weakness of Distant Learning System is the maintenance of quality in the Programmes. Strategically, NTI has addressed this challenge by:

1. Routinely bringing in Senior Academics from Universities and Colleges of Education on Sabbatical Leave to inject new ideas into her Programmes. Presently three Professors are engaged to put together the possibility of the Institute starting 6 degree programmes by January 2015.

2. Engaging the services of Professional Consultants in the field of education to assist in monitoring and evaluating the conduct of her Programmes nationwide. This is done almost on yearly basis. For instance, the quality assurance reports on PGDE, NCE, ADE, PTTP and Millenium Development Goals' related training for December 2012 to December 2013 were presented to the Management of NTI in February 2014 by the Principal Consultant, Professor Emeritus Thomas K Adeyanju. The report laid emphasis on areas to improve upon subsequently (Adeyanju, 2014a).

3. Always involving other stake holders such as UBEC, SUBEB, Teachers Registration Council and N.U.T. in the regular monitoring and evaluation exercise
4. Constantly reviewing instructional materials to keep abreast of modern teaching techniques
5. Implementing the NCCE and NUC Minimum Standards and strictly adhering to the admission criteria for all programmes
6. Collaborating with Development Partners and International Educational Institutions and NGOs for best Practices. At the moment the Institute is in collaboration with some African countries on some pedagogical components under the umbrella "Teacher Education in Sub-Saharan Africa (TESSA)". Also, through its most recent annual nation-wide MGD workshops, it has retrained over 800,000 teachers since 2006 (Adeyanju, 2014b).
7. The selection of only qualified professional Teachers as Course Tutors in her Study Centres
8. The deployment of permanent fulltime Study centre Desk Officers for prompt handling of Students' complaints and to check malpractices at the centres nationwide (www.ntinigeria.org).

Aside these prospects, the Institute has recently mapped out new areas for exploration. These are introduction of Bachelor degree programmes: B. A. (Ed.) Primary Education Studies, B. A. (Ed.) Social Studies, B. A. (Ed.) English Language, B. Sc. (Ed.) Integrated Science, B. Sc. (Ed.) Mathematics and B. Sc. (Ed.) Physical and Health Education. These programmes are for a start and more programmes will be included as the Institute progresses. The Institute also has plan to establish School of Educational Innovation and a National Centre for Teaching of English. The Institute is about the only one within the neighbouring countries that has a radio broadcasting station. At the moment and within their operation hours, educational instruction, educational news, discussion on some issues in education and strategies for teaching and development of instructional materials are constantly being discussed. However, only very few states in Nigeria can receive signals from this station. It is hoped that establishment of school Education and National Centre for Teaching English will be greatly aided by the radio station for a good service.

According to Adeyanju (2014b), since the establishment of the Institute in 1976, it has successfully trained a number of teachers in various programmes while many others are presently on. See Table 1 for details.

**Table 1: Teacher production by Programme Since 1976 and Students Presently on Progamme**

| S/No | Programme | Number of Teachers Produced | Number of Students Presently in Training |
|------|-----------|------------------------------|-------------------------------------------|
| 1 | Teacher Grade II(TC II) | 500,000 | - |
|   | Advance Diploma in Education (ADE) | 1,000 | 439 |
| 2 | Nigeria Certificate in Education (NCE) | 180,000 | 46,979 |
| 3 | Pivotal Teacher Training Programme (PTTP) | 40,000 | 13,212 |
| 4 | Post Graduate Diploma in Education (PGDE) | 50,000 | 19462 |
| 5 | Special Teacher Upgrading Programme (STUP) | 50,000 | - |

This table shows that NTI has done much as far as teacher training in Nigeria is concerned. This however appears to be insignificant when compared with the huge population of those in need of teacher education in Nigeria.

**Conclusion and Recommendations**

This paper has shown how much the National Teachers' Institute (NTI) in Nigeria is able to achieve as far as teacher production and retraining is concerned, what lies ahead and strategies mapped out to grease the attainment of the goals. If it must serve the nation and the surrounding countries satisfactorily, then a number of improvements are required. First, the ongoing progammes must meet up with expected quality while the mistakes of the past should be carefully noted as they are mounted. Second, the speed with which new programmes are mounted demands fast response from the proprietor in terms of finance. The challenges are obvious but not without implications on the government of Nigeria, the individual students and the Institute if they must be adequately addressed.

It is a recommendation of this paper that concerted efforts that would bring about improved finances leading to full on-line operations, expanding the band width of the website and radio station is urgently needed. It might be necessary to invite external observers/quality assurance assessors with a view to using their comments to rate NTI programme internationally. This is expected to be the beginning of wooing foreign students from far and near for her ODL programmes with NTI. It is envisaged that such inspection would be necessary only when the degree programmes have taken off successfully.

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# CHILD ABUSE: HOW EDUCATION CAN CURB ITS EFFECTS

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## Abstract

Child abuse is a growing phenomenon especially in developing and under-developed nations where poverty, ignorance and corruption are also growing concern. The study examines the notion of child abuse as a contemporary world problem. It begins with an explanation of who is a child and proceeds to the definition of child abuse. As a global menace, the study considers what constitutes child abuse, causes of child abuse as well as effects of child abuse and prevention. The paper concludes by stating that poverty and ignorance, which are the springboards of child abuse, should be aggressively tackled by communities and governments alike. It recommends among other things that government should initiate policies to make education and economic empowerment opportunities available to greater number of people to eradicate or reduce poverty and ignorance; electronic and print media should regularly advertise subjects of child abuse, the causes, effects and signs and give tips on how to solve the problem; teachers should co-operate with parents through PTA to plan some activities that would involve parents and their children/wards so as to establish good relationship between them; the government and non-government agencies such as social welfare departments should organize prevention campaigns to help people to avoid abuse and also educate them to love and care for children.

## Introduction

Like terrorism, environment pollution, HIV-AIDS, drug trafficking, et cetera, child abuse has become a serious contemporary world problem that requires collective global action. Although, the phenomenon could be said to be as old as humanity, it assumed greater dimension in modern state and cuts across all socio-economic strata of all human communities. To say the least, child abuse has become almost an institutionalized practice in some parts of the world because of the economic implications. It manifests hitherto in various forms in both official and private domains and among the rich, the poor, the educated and the illiterate in society.

For example, the late superstar and pop king artist, Michael Jackson was reported by the media to have held out his newly born baby through the window of his hotel room in response to ovation of his fans but later apologized for the act. Similarly, a Senator of the Federal Republic of Nigeria and former Governor of Zamfara state, Yerima Ahmed Sanni married a 13 year old Egyptian girl as a wife. But Sanni was not sanctioned for contravening the Child Rights Act of 2003. What therefore comes to mind in these cases is a clash of the right of the child and the freedom of adults to private living as guaranteed by the constitutions of nations and the United Nations Declarations of Human Rights.

The notion of a child has been viewed in different ways by individuals and organizations. However, in the context of this paper, some definitions will suffice. Biologically, a child is a human being between the stages of birth and puberty. The legal definition of a child generally refers to a minor, otherwise known as a person younger than the age of an adult. (UNICEF, 2005) defined a child "as the period for children to be in school and at play, to grow strong and confident with the love and encouragement of their family and an extended community of caring adults. It further explained that a child is the precious period in which children should live in safety, free from fear, violence and protected from abuse and exploitation by adults.

The United Nations Convention on the Rights of the Child (2005) conceptualized a child as anyone within the age of zero (0) to eighteen (18). It further explained that developmentally and biologically, a child refers to the period between infancy and adulthood. It is the dynamic learning journey that children embark on before entering into the adult world. Furthermore, the (Medical Dictionary, 2011) defined a child as "a boy or girl from birth to an adult age". It states that during this period, the uniqueness of the child must be nurtured by parents, guardians and society. In other words, a child can be referred to as one who depends on adults, be it direct parents or guardians for protection from physical, intellectual and psychological danger and for all practical purposes.

### Conceptual clarification

### Concept of Child Abuse

Child abuse is a sociological problem, which involves all nations. It is a phenomenon, which encompasses all forms of maltreatments that make a child to lose his/her human dignity. As defined by the (International Child Abuse Network, 2003), child abuse is the bad treatment of a child under the age of 18 by a parent, guardian or someone within or outside the home. Abuse of a child is an action or anything that may cause injury or put the child in danger of physical or psychological pain. It is any action, which endangers or impairs in the short or long run, a child's physical, mental or emotional health and development.

Child abuse and aversive parenting practices in general, have the potential to delay the performance of children in school. It has the potential to undermine schools' ability to satisfy standards of school progress entailed in the Child Rights Act of 2003. (International Labour Organization, 1998) cited by (Bassey, Baghebo and Out, 2012:150) estimated that 24.6 percent of children between the ages 10-14 in Nigeria were working. In the same vein, (Heckman and Rubinstein, 2001) are of the opinion that childhood abuse has the potential to negatively affect student's economic productivity in adulthood by way of its impact on achievement in middle and high school. Abused children are also prone to difficulty in forming new relationship with peers and adults and in adapting to norms of social behavior.

The World Health Organization (WHO) defined child abuse as "any act or failure to act; that violates the rights of the child and endangers his or her optimum health, survival and development". Generally, the organization describes child abuse as forms of physical and/or emotional ill-treatment, sexual abuse, neglect or negligent treatment or commercial or

other exploitation, resulting in actual or potential harm to the child's health, survival, development or dignity in the context of a relationship, responsibility, trust or power application. Amadike (2010) states that child abuse is "the causing or permitting any harmful or offensive contact on a child's body; and communication or transaction of any kind, which humiliates, shames, or frightens the child". In sum, child abuse is any form of mistreatment or maltreatment, action or inaction that impacts on growth and development of a child in the short or long run within or outside the home.

**Categories of Child Abuse**

Child abuse manifests advertently or inadvertently in various forms in the world. The following are some areas of child abuse:

1. Child Labour: This refers to subjecting a person under the age of 18 to a paid-job or money generating exercise, which exposes the person to physical, mental, social, or educational danger. International Labour Organization (ILO, 1998) reported that 24.6% of African children between the ages of 10 and 14 are used as labourers.

2. Childhood Marriage: This refers to the act of giving out a female child below the age of 18 to marriage. Most of the victims do not usually enjoy the pleasure of marriage or make responsible house-wife or parent due to immaturity. Early child marriage is a major problem in the world. (Awake, 2004), reported that 31,859 children between 10-14 years old were impregnated in 1998 in Brazil alone. The report revealed that most of such abused children cannot cope with marriage lives hence may suffer from stress that follow throughout their lifespan.

3. Physical battery: This is a kind of maltreatment given to a child in the name of correction. It involves physical injuries on the child in the guise of punishment such as punching, kicking, flagilation, biting, choking, hitting, throwing, stabbing, shaking, etc with hand, stick or other objects by an adult parent or other persons who may stand in locus parentis for the child. This type of child abuse is mostly experienced among illiterate and poor class of people and may result in sudden death of a child.

4. Street hawking: This refers to a situation whereby persons move about from place to place to advertise their products and find buyers for them. It is one of the most act of child abuse in the world especially in developing nations where poverty, ignorance and illiteracy are the order of the day. Hawking exposes children to serious abuses such as rape, assault, kidnap, accident, violence, fighting, among others.

5. Substance abuse: This involves the use of alcohol, tobacco or other hard drugs by parent(s) or guardian in the presence of a child or involving the child in the manufacturing, distribution or purchase and even consumption of such substances.
6. Child Lift: This involves the lifting of a child advertently or inadvertently by adults on one hand and with one hand. This may occasion short or long term internal joint damage of the child's hand.

Similarly, the International Child Abuse Network posits that child abuse may occur in the following ways.

1. Physical abuse: This includes to hit, shake, burn, attack, strangulation, etc. (Amadike, 2010) citing (Musa, 2004) indicated that hundreds of thousands of children are physically abused each year by someone close to them and thousands of children die from injuries; those who survive the emotional scare, are deeper in abuse than the physical scares.

2. Emotional abuse: This is also known as psychological or mental abuse. This is a form of abuse characterized by a person being subjected or exposed by another to a behavior that may result in psychological trauma. (Vachass, 1994) defined emotional abuse as the systematic diminishment of a child by another. Emotional abuse may manifests in the following perspectives:

i. Verbal aggression: This abuse involves the use of words that will upset or annoy someone else.
ii. Isolation: This relates to preventing a child from participating in certain normal fora such as the family, friends or peers, club, etc.
iii. Causing fear: This is done by way of intimidation, threats, terror, etc.
iv. Disapproval: This involves denying the child social and emotional responsiveness.
v. Rejection: This refers to abandonment of the child, such as refusal to show affection or concern to a child when he or she becomes sick.
vi. Terror: This involves threatening a child with severe punishment or creating a climate or an atmosphere of fear in a child.
vii. Belittling: This entails making the child feel less important by not seeing anything reasonable in his or her opinion or actions.

3. Sexual abuse: This refers to any behavior by any adult towards a child to stimulate either the adult or child sexually. Sexual abuse includes fondling, showing of private parts by an adult, direct sexual intercourse, oral and anal sex, forcing a child to watch while others have sexual intercourse, viewing of pornography, etc.

4. Neglect: This is a passive form of abuse in which an adult who is responsible to provide social and economic protection for a child fails to do so adequately. It includes absence of adequate nourishment, failure to provide sufficient supervision, medical care, shelter, emotional and physical security among others. Child Welfare Information (Gateway, 2008) viewed child neglect as any act or failure to act on the part of a parent or guardian, which results in death, serious physical or emotional harm, sexual abuse or exploitation of the child. In the words of (Health24, 2012), child neglect is the failure to provide children with adequate food, clothing, shelter and medical care. Practical neglect also involves abandonment, expulsion from home, and failure to enroll children in school or skill acquisition programmes.

**Causes of Child Abuse**
Child abuse like any other phenomenon has some root causes. (Ariyo, 2001) in (Amadike, 2010) informed that Africa has a high level of poverty in the world. In order to relief suffering, some parents are often willing to allow their children to move out sometimes believing that the child would be better out there. Child abuse is widespread and can occur

in any cultural, ethnic and income group. It is associated with the complex combination of political, economic, personal, social, and cultural factors such as:

1. Illiteracy and Ignorance: Most parents in developing nations of Africa, Latin America, Asia, etc are not educated neither do they appreciate the values of education or see reasons to be friendly with their children. They believe that a child would be what God wants him or her to be without formal education;

2. Material poverty: The economic situation in a country has a great impact both on parents and children. Poverty has made most parents in some parts of the world to send their children out for street begging, early marriage and withdrawal from school. (Wamari, 2004) opined that street begging is a reflection of a deeper socio-economic problem that the law cannot solve. According to him, high level of poverty is making people desperate for basic needs and makes them to involve their children in unacceptable acts to eke a living;

3. Broken Marriage: Research has shown that every year the family life of thousands of children is disrupted by divorce. Saturday Punch (2010) reported a case of Jeremiah Shelika, the music producer of 2face Idibia, who stated that the separation of his parents made him not to further his education;

4. Intergenerational natural inclination to violence: Most children learn violent behavior from their parents and grow up to abuse their own children and others. The abusive behavior is transmitted over generations. (Awake, 2004) concluded that children brought out in such homes see violence, attack, physical aggression as normal because that is acceptable in their homes;

5. Social Stress: This refers to different social conditions, which a child is exposed to within a family. These conditions include among others unemployment, illness, poor housing conditions, large family, death of a family member, use of alcohol, drugs and negligence;

6. Negative influence of culture, traditional philosophies and customs; and

7. Unrealistic or unnecessary high standards of expectations about life and children.

**Educational Effects of Child Abuse**
Learning is a relatively permanent change in behavior, action or thought. Thus, abuse affects children cognitive and emotional achievements and development. Children who suffer abuse develop a range of societal and self-destructive behaviours and thoughts by trying to cope with the abuse and to understand the situation they find themselves.

Thus, children who have been abused may exhibit traits such as fear, anger, sadness, guilt, mistrust, decreased self-esteem, truancy, depression, post-traumatic stress disorders, etc. These can result in low cognitive ability and poor performance in many spheres of life especially in the school system. Also, abuse of children prevents them from having real relationship with people. This may have a life-long effect on them. (Child Help, 2013) revealed that the immediate effect of child abuse can be extremely serious, though it varies according to the types of abuse and poses pedagogical problem.

Abuse destroys a child's sense of self and personal safety, and leads to adverse effect on intra-personal thoughts, emotion, health, social, skills, learning impairment and physical health. Abused children are deprived of many skills necessary for development. For instance, a child may have the fear of doing anything new because of the fear that it will lead to involving attack from an abusive parent, guardian or a bully teacher who has his or her eyes on the child.

However, the effects of abuse on children may be considered from the following perspectives among others:

**1. Learning and development problems:** Strong correlation has been established between child abuse and learning difficulties and poor academic performance (Gilbert, 2009; Mills, 2004; Veltman and Browne, 2001). Research has shown that abused children perform less well on standardized tests and examinations.

**2. Behavioural problem:** Studies on effects of child abuse over decades have also shown that child abuse is linked with behavioural problems in childhood and adolescence. (Frederico, Jackson and Black, 2005) stated that the earlier children are maltreated the more likely they are to develop behavior problem in adolescence equally in life.

**3. Physical effect:** This type of effect varies according to the types of abuse and manifest in unexplained burns, cuts, bruises, or in the shape of an object, bite marks, anti-social behavior, problems in school, fear of adults, among others.

**4. Emotional effect:** The emotional effect of child abuse may be evident in apathy, depression, hostility or stress, lack of concentration, eating disorders, etc.

**5. Sexual effect:** This type of child abuse results in inappropriate interest in sexual acts, nightmares and bed wetting, drastic changes in appetite, over indulgence in sex acts and aggression.
**6. Neglect:** Neglect of child by parents or guardian results in unsuitable clothing for weather, dirty and unhygienic appearances, extreme hunger and despondency.

**Conclusion**
From the preceding discourse, we can discern that the study examined child abuse from the perspective of its meaning, causes, types and effects. In a nutshell, it established the fact that child abuse is a growing global phenomenon especially in developing and under-developed nations. It is a product of poverty, ignorance and illiteracy and requires mass enlightenment campaigns in churches, mass media, schools, and so on.

**Recommendations**
What would be done if one suspects that a child has been abused? However, it should be noted that we can make a difference in the life of an abused child, especially if we take steps to stop the abuse on knowing it. When talking with an abused child, one of the best things

to do is to provide a calm, reassuring and unconditional support. Do not talk about it as doing so would imply taking the child through the journey of the ugly experience.

Specifically, this paper recommends that:

1. Government and non-government agencies should organize prevention campaigns to help people to avoid child abuse and also educate them to love and care for children.
2. Government and non-government organizations should build the prevention campaign programme to give skill to parents on how to care and teach their children.
3. School Counselors should help to educate their students, give motivation and advice to affected students when it gets to their knowledge.
4. Teachers should co-operate with parents through parents-teacher associations (PTAs) to plan some activities that would involve parents and their children/ward so as to establish good relationship between them.
5. The electronic and print media should regularly advertise subjects of child abuse, the causes, effects and signs and give tips on how to solve the problem.
6. Government should initiate policies to make education and economic empowerment opportunities available to greater number of people to reduce poverty and ignorance.

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# THOSE WHO ENGAGE: LEARNERS' MATHEMATICAL REASONING WHEN GENERALIZING FROM NUMBER PATTERNS IN THE GENERAL EDUCATION AND TRAINING PHASE IN ONE SOUTH AFRICAN HIGH SCHOOL.

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## Abstract

This article explores the learners' mathematical (algebraic) reasoning when generalizing from number patterns in the general education and training phase. Data was collected from a school in greater Johannesburg urban area by means of a questionnaire based task involving number patterns. The mathematical reasoning of the grade 9 participants when generalizing from number patterns was examined within a *commognitive framework* (Sfard, 2008). According to this perspective, thinking is a special activity of communication in which a participant of a discourse engages. The participants' responses to questions in the questionnaire based task were examined and qualitatively categorized according to particular aspects of the discourse they used, specifically routines (strategies) and visual mediators. The participants' generalization routines were further classified into one of the following three main categories; <u>numeric</u>, <u>figural</u> and <u>pragmatic</u> generalizations. The participants' use of visual mediators within or across generalization routines was also analyzed. The analysis focused on how learners derived rules for the $n$th term and what kind of justifications they gave for their responses. The results strongly support the notion that students' algebraic reasoning when generalizing in number patterns is <u>intertwined</u> with their choices of routines and mediators. Most learners used recursive routines while a few used explicit routines (which in the study are classified and categorized as numeric routines) and number-mediators dominated when generalizing in mathematical patterns.

## Introduction

Mathematical reasoning is one of the important aspects of the new curriculum in South Africa (DoE, 2002). To partake in this activity learners are expected to actively examine, conjecture, make valid justifications, generalize and present arguments for mathematical solutions realised in problem solving. Educators are therefore expected to promote and incorporate these practices during mathematics lessons from early stages.

In South Africa, algebraic reasoning in the General Education and Training band (GET) curriculum is very limited in scope and yet the learning achieved in Mathematics in the GET band has to provide the basis for the demands of Mathematics in the Further Education and Training (FET) phase. This situation creates a need to explore how mathematical reasoning evolves from algebraic reasoning in the GET band. The essentials of Numeracy developed in the GET band are taken further into working in more symbolic ways (algebraic) in the FET band. In so doing, the emphasis on contexts and integration within Mathematics and across the curriculum is maintained where mathematical modelling which largely constitutes algebraic generalization becomes more prominent. The GET engagement with shape, space and measurements becomes more formalised, and the methods and uses of statistics and chance are dealt in greater depth in the FET. How Mathematics can contribute to an understanding of financial issues is taken beyond dealing with budgets as in GET band.

## Background

Recently, there have been curriculum shifts in mathematics in many countries that are driven by national policies, and influenced by research. There is advocacy for a transition from traditional ways

of teaching that emphasize mastery of procedures and algorithms, to approaches which also foster mathematical reasoning in learners or learning mathematics as a set of practices e.g. justifying, representing, generalising etc. It is believed that these new approaches to teaching mathematics would enable learners to re-invent mathematical ideas, procedures and algorithms when forgotten hence serve to aid retention of the learnt facts. These curriculum innovations are also found in South Africa. Brodie and Pournara (2005) argue that these shifts are signalled by terms such as educator, facilitator and mediator within the South African curriculum. According to Brodie these terms indicate new roles for teachers and learners. The South African Department of Education, aligning itself with these curriculum shifts, advocates that learners should investigate patterns and relationships in order to "develop mathematical thinking skills such as generalizing, explaining, justifying, representing ..., predicting and describing" (DoE, 2002:63).

The revised national curriculum statement (RNCS) put in place to strengthen Curriculum 2005 (C2005) is the first National Curriculum Statement (NCS) that emphases integration of mathematical reasoning within mathematics and across other learning areas (DoE, RNCS: 2005). The C2005 is an Outcomes-Based Education (OBE) curriculum established in 1997. Therefore, it is imperative that teachers and policy makers understand how learners reason mathematically in the context of the NCS demands. It is against this background that an exploration of learners' algebraic reasoning when generalizing was decided. In particular the aim was to explore the representations and routines grade 9 learners use when engaging with a task on number patterns and also the difficulties they experience. The questionnaire-based task being used in the study contains questions set in different representations (forms) of number patterns. Some questions, are formulated in terms of numbers only (e.g. table of values), some in terms of pictures/diagrams and some as word problems. Table 1 provides a summary of how the Mathematics Learning Outcomes (LO's) of the GET and FET bands are linked:

**Table 1: How the Mathematics Learning Outcomes of GET and FET bands are linked.**

| LEARNING OUTCOME | GET (RNCS) PHASE | FET PHASE |
|---|---|---|
| 1 | Number and Number Relationships | Number and number Relationships |
| 2 | Patterns, Functions and Algebra | Functions and algebra |
| 3 | Shape and Space | Shape, Space and measurement |
| 4 | Measurements | Data Handling and Probability |
| 5 | Data Handling and Probability | |

**Study focus**

This paper emerges from a broader study aimed at researching grade 9 learners' algebraic reasoning during problem solving involving number patterns. This study is therefore located in the broad area of mathematical knowledge for learning. Generalizing and justification activities of algebra afford us opportunities to express relationships between quantities. Such activities provide further opportunities that help us move beyond empirical arguments of arithmetic into making algebraic generalizations and justifications. The reasons for the choice of the number patterns topic in algebra are based on the following factors: our experience of working as high school mathematics educators

in South Africa: most high school learners (grades 8 – 12) experience difficulties to reason algebraically even after being introduced to algebra, our awareness of the current curricular developments both locally and internationally, and also our knowledge of existing literature and current research related to learners' algebraic thinking particularly when generalizing in number patterns

In order to gain deeper insights into the learners' reasoning when generalizing, the written work of the 29 participants was analysed followed by interview responses from a target group of six learners drawn from the main sample. The following specific research questions guided the study: What routines (*strategies*) and visual mediators do grade 9 learners use when engaging in a task on number patterns? How do these grade 9 learners explain orally their thought processes in problem solving involving number patterns?

**Theoretical background and literature review**

In South African classrooms, the focus of algebra in the new curriculum has moved away from a focus on symbolism, rote learning and manipulative skills to the link between procedural and conceptual understandings.  Procedural and conceptual understandings are essential for the development of problem solving abilities and routines that bring about progress in the learning of mathematics, in particular algebra. In the RNCS for the learning area mathematics (DoE, 2001: 19), the LO on "Number Patterns, Functions and Algebra" stipulates that a learner must be able "to recognize, describe and represent patterns and relationships, and solve problems using algebraic language and skills" (DoE, 2003a: 37). There is no specific statement that emphasises learning algebra skills in their own right; rather the emphasis is on using algebra for the purpose of problem solving and communication in mathematics. This suggests that mathematics is about learning to communicate mathematically within a discourse. For example, the learner needs to become fluent with vocabulary and symbols, ways of speaking, writing and presenting the mathematical arguments. Within the South African school curriculum, algebra is made up of "simplifying expressions, factorizing, solving equations, functions and graphs, variables, word problems and others" (DoE, 2003a : 37). At GET phase in particular, school algebra consists of "number patterns, solving linear equations, graphs, algebraic expressions and algebraic vocabulary" (DoE, 2002: 75-79).

The high visibility of pattern-based activities in recent school mathematics materials points to the increased value placed on teaching patterns as a productive way to introduce algebra (Driscoll, 1999:10). As early as kindergarten, learners see different coloured geometric shapes often sequenced in orderly manner from which they are asked to predict the next few shapes. Then later, when number concept is taught these learners begin to recognize and describe the various number patterns. The habit of thinking that causes one to look beyond a perceived pattern to wonder what "always works" for any pattern's rule of generality is a feature of a broader capacity of mathematical thinking. Generalization is a thinking process that applies throughout mathematics. The literature is replete with studies documenting students' difficulty (at different levels) with algebraic reasoning as well as writing generalizations (e.g. Herscovics & Linchevski, 1994; Sfard & Linchevski, 1994; MacGregor and Stacey (1997) investigated students' algebraic learning and found that students do not easily learn how to express simple relationships in algebraic notation. They further found that students extend patterns numerically more easily than they can generalize about them. Further literature highlights several contexts where mathematical (number) patterns can be used to promote algebraic reasoning (Mason, 1996; Bishop, 2000; Zazkis & Liljedahl, 2002; Becker & Rivera, 2006; Radford, 2006; Carraher, Martinez, & Schliemann 2007; Papic, 2007 etc.). From this wide range of research, not much has been reported on algebraic reasoning at GET phase from a South African perspective (Brodie, 2005). This study, therefore, is intended to contribute to filling this gap

in the South African mathematics education, and that the findings thereof will benefit current formal and informal debates in mathematics education research community.

**Commognitive approach to study learning**

The introduction of the new curriculum following the advent of democracy in South Africa brought changes in mathematics teaching and learning in the classrooms. These changes are consistent with the view that mathematics should be viewed as a key subject among other learning areas (DoE, 2002; 2003). The shifts in the curriculum are in line with the communication theory of cognition (Sfard, 2007; 2008) which describes thinking as an activity of communication and learning mathematics as an initiation into a specific type of a discourse.

The commognitive framework (Sfard, 2008) is a socio-cultural approach. Within this framework *thinking* is defined as an individualization of interpersonal communication, although not necessarily verbal. *Discourse* is considered a special type of communication, made distinct by its repertoire of admissible actions and the way these actions are paired with re-actions. To emphasize the unity of cognitive processes and communication, the word *commognition*, a combination of the two, is used to name the framework. Mathematics, as any academic discipline, may be considered a form of discourse made distinct by four characteristics: words and their uses, visual mediators, routines and endorsed narratives, as detailed below.

*Words and their uses.* Any professional discourse has a unique vocabulary. Some of the words may be used in other discourses, either in the same way or according to a different definition. Words and their uses are central to a discourse as often they determine what one can say about the world. With regard to the area of functions and graphs, we find words such as slope and function with unique uses in the mathematical discourse.

*Visual mediators*. Those are the objects acted upon as a part of the communication. While colloquial discourse is mediated mainly by images of concrete objects that exist independently of the specific discourse, in mathematics, most symbols and other mediators were created mainly for the purpose of communication. Visual mediators of the mathematics discourse include algebraic symbols that mediate ideas such as written numbers and graphs, or other symbols like those that represent variables, coefficients and equality. The mediators used in the communication often influence what one can say about the idea discussed. To illustrate, while solving equations in algebra, students often participate in a different discourse if they use graphs as their visual mediators, or if they refer to the algebraic symbolic equation as their discursive objects.

*Routines*. A routine is a set of meta-rules defining a discursive pattern that is repeated in similar types of situations. Those rules are the observer's construct as they describe past actions that were noticed by the observer. Although they describe past actions, routines are helpful in learning a new discourse as our ability to act in new situations often depends on recalling one's or others' past experiences. An example for a routine often practiced in mathematics regards finding the slope of a given linear function. The specific mediator chosen for a function (e.g. graphs or algebraic symbols) often dictates the routine chosen for that purpose.

*Endorsed narratives*. Endorsed narratives are any text that can be accepted as true by the relevant community. Specifically, in mathematics, the endorsed narratives are those narratives that become "mathematical facts". Narratives such as axioms, definitions and theorems are all endorsed narratives, with each of them being derived differently.

**Design and methods**

This is an exploratory case study adopting mixed methods. This study aims to explore and interpret in detail the learners' spoken and written responses-explanations using both qualitative and quantitative approaches respectively. The spoken explanations refer to the learners' comments during the task-based interviews while the written responses refer to written answers to the task-based questionnaire. Creswell defines a qualitative study as "an inquiry process of understanding a social or human problem based on building a complex, holistic picture, formed with words, reporting in detail views of informants and conducted in a natural setting". On the other hand, he defines quantitative study as "an inquiry into a social or human problem, based on testing a theory consisting of variables that can be measured with numbers analysed statistically in order to verify the predicted generalizations about a theory" (Creswell, 1994:2 cited in Leedy, 1997). Leedy (1997) further points out the essential features of the two approaches. A quantitative approach relies on deductive analysis where data is reduced and presented in numeric form whereas a qualitative approach uses inductive methods of analysis i.e. narratives are constructed from data.

**Sample, data collection and documentation**

The sample in this mixed methods case study consisted of 29 grade 9 learners aged between 14 and 16 from one suburban area in Johannesburg, South Africa. Purposive and convenience sampling was used to select the subjects and research site respectively (Schumacher & McMillan, 1993:401). Purposive sampling is based on the assumption that one wants to discover, understand, gain sight; therefore one needs to select a sample from which one can learn the most. Six learners were selected according to their overall abilities in mathematics subject from grade 8 and also according to their ability to communicate/speak.

A questionnaire-based task on number patterns solicited written responses in the form of solutions to mathematical questions about number patterns, and explanations of their thinking. The first phase of analysis of the participants' written responses provided both quantitative and qualitative data. The second phase, follow up interviews were conducted with the six learners mainly to unpack their reasoning (verbal or otherwise) towards the kind of explanations they gave in answering the questionnaire-based task. The tenettes drawn from the commognitive theory underpinning the study provided analytic tools for data analysis. Analytic induction involved reading and re-reading interview transcripts, notes made on each of the 29 learners' written responses in order to keep track of their routines. Responses were then classified on the basis of the formed subject issues (units of analysis) such as the kind of routine procedures the participants demonstrated. It is from the routines that one can be informed of the learners' reasoning skills when generalizing from number patterns (Ndlovu, 2011:33). Experts (supervisor and colleagues) were consulted to assess the questionnaire task on its content validity. They face-validated the task by critiquing for example, the content knowledge level in the questions, ordering of questions and clarity of some phrases in each question. The task was designed to cover enough content on the number patterns. Enough content gave adequate information about learners' knowledge, meanings and algebraic reasoning when generalizing in patterns. The systematic coding and classification of data was used for both interviews and written questionnaire-based tasks see table 2. The learners' representations, meanings and routines noted from their written responses were all classified into the key generalisation categories derived from Becker & Rivera (2004) and Lannin (2005). These categories are: numerical, figural, pragmatic and unclassified other, each with further sub-categories are summarised below.

**Table 2: The classified categories and sub-categories of the *learners' routines* (LR) and *learners'***

| LR Category | LR Sub-category | Further LR sub-categories | L iconic | V numeric | M Symbolic/words | Table/graph |
|---|---|---|---|---|---|---|
| Numerical generalization | Recursive (Re) | Counting (Co) Chunking (Cu) Guess & check (G) | | | | |
| | Explicit (Ex) | Structural analysis (SA) Work backwards (Wb) also called reversibility Solve equation (Se). | | | | |
| Figural generalization | Proportioning (P) Structural analysis (SA) | | | | | |
| Pragmatic generalization | Relational (R) | | | | | |
| Unclassified Others | Unclassified | Unclassified | | | | |

The following questionnaire-based task was instrumental for the study, where questions 1 and 2, pictorial patterns were presented using three consecutive terms, question 3 thus numeric patterns were presented in both pictorial and tabular forms and finally question 4, a numeric patter was presented as a simple sequence of numbers.

**QUESTION 1**
A contractor is asked to build a new set of townhouses in attached clusters of different sizes. He created a plan for one, two and three house clusters as shown in the following page. The builder used computer software to draw and generate line segments used to represent the houses.
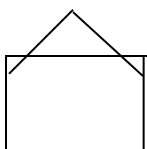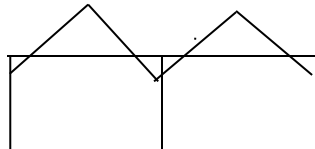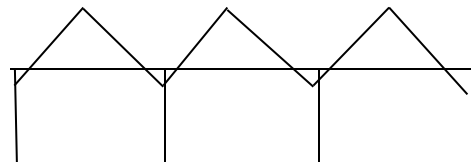


**1 house**          **2 houses**                    **3 houses**

1. How many line segments are needed to draw or create a plan for:

   i)       4 houses   ii) 10 houses   iii) 50 houses

2. Generate a formula or rule for the above pattern (i.e. nth term)

## QUESTION 2

The figures below show three groups of tiles:



Group   1          Group   2                Group   3
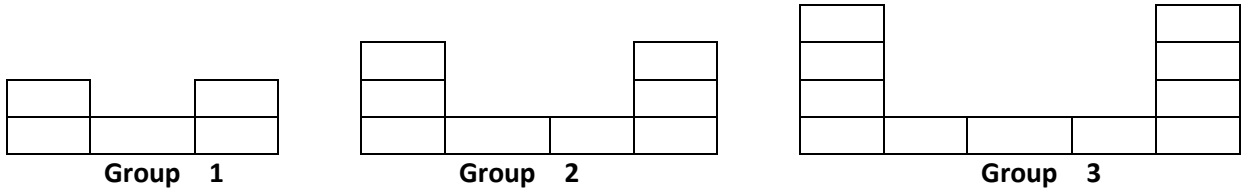
1. Draw tile-group number 5. Explain in words what group number 5 would look like and how many tiles are in the group?

2. How many tiles are in each of the following group number:

   a)  Group 6  b) Group 7   c) Group 10  d) Group 50

3. How many tiles are in the $n^{th}$ group of tiles?

## QUESTION 3

The United Artists Studio makes geometric decorative borders or motifs for picture frames. One motif is made from a pattern consisting of 4 dots and five lines joining these dots as shown diagrammatically and in table form below.



| Number        of motif ($m$) | 1 | 2 | 3 | 4 | 20 | 30 | 63 | m |
|---|---|---|---|---|---|---|---|---|
| Number of dots ($d$) | 4 | | | | | | | |
| Number of lines ($l$) | 5 | | | | | | | |

1. Extend and draw the next two motif's designs.

2. Copy and complete the above table for the rest of the motifs' designs or pattern.

3. What is the mathematical relationship between:

   i)       $m$ and $d$    ii) $m$ and $l$.

4. Will the points representing each of the relationships in i) and ii) lie on a straight line when plotted on the graph?

## QUESTION 4

Study the number patterns and answer the questions that follow:
   a) 5;   12;   19;   ___;   ____; ____;.....

100

b) 35;  30;  25;  ____;  ____;  ___ ; ....
1. Determine in each case;

i)        the next three terms in the pattern,   ii) the $10^{th}$ term and iii) the $50^{th}$ term.

2. Generate a formula or rule for the $n^{th}$ term

During the analyses of the collected data, our foci were on pattern generalization routines, representations (mediators) and the interpretations and meanings the learners hold. The meanings are inferred from spoken explanations as well as written responses to communicate mathematical reasoning. This communication is in the context of an algebraic discourse. For the purpose of monitoring the trends in the data, "learner routines" (LR) and "learner visual mediators" (LVM) are two main classifications of participants' work in this study. The LR and LVM each entail various forms of learners' knowledge content, solution representations, and meaning all of which contribute to pattern generalization.  The learners' forms of communication in an algebraic discourse when generalizing from the number patterns is interpreted in terms of the *commognitive* visual mediation as used by Sfard (2008) in order to respond to the two questions of the study. Sfard's visual mediation construct is designated as learner visual mediators in table 2. In this study, LR classifications together with LVMs classifications were used in both quantitative and qualitative analyses of the data. As defined in commognition perspective section, "visual mediators provide the images with which the discussants identify the object of their talk and coordinate their communication" Sfard (2008:147). Visual mediation is a process that embraces the use of visual mediators for communication purposes in a discourse. The communication of algebraic generalizations takes different forms, for example; symbolic, iconic, gestures and verbal (verbal includes written words and spoken words).

**Learners' generalization strategies/routines**

Generalizations in mathematics and algebra in particular are expressed in various ways. These include verbal (i.e. written and spoken words) or symbolic syntax which translate sometimes to the same or different meaning. For example L23 approached question 1 in two different ways:  He first applied both recursive and explicit methods to generate the rule   $T_n = 5n + 1$. A different learner used a different approach to the same question (i.e. Question 1) by considering the base of each set of cluster houses as one line segment. This was an approach that led the learner to generate a rule $T_n = 3n + 3$. (Only the first rule is, of course, correct). Most learners were able to express the given sequence from a particular scenario through a general rule by means of a functional relationship without realizing that they were making use of independent and dependent variable-concepts in the context.

**Learners' choices of generalization routines and mediators**

The learners' written responses during the problem solving session on number patterns include the following mediators:  symbols or pictures (iconic), numbers, verbal explanations, tables and graphs. The routines chosen by these learners when responding to the questionnaire task varied according to the content and context embedded in each question. Written responses to all the questions were carefully scrutinized and analyzed along two main dimensions: **routines** (our emphasis) and learners' type of **mediators.**

The number of responses to the 25 items spread across the four questions of the questionnaire based task by the 29 participants was 787; this was because some had given more than one form of

solution representation. The actual number of expected answer-responses is 725 i.e. (25 x 29). The total number of routines (from 787 responses) identified in the participants' responses across the three main categories of generalization (See Tables 3) is 1450 and this number is double the number of the expected responses because some learners used more than one routine within a particular stage of each sub-question in the questionnaire based task. There were also 10 instances of a question not having been attempted at a particular stage, for which no analysis or characterization was possible. There were more participants' responses to the numeric decontextualized pattern in Questions 4 than in any of the other three questions in the task. This could mean that the participants were more familiar with the arithmetic situations than others. Table 3 shows the distribution of the participants' use of the routine categories over the four questions in the questionnaire-based task.

**TABLE 3: Overall routine utilization by 29 participants in the study**.

| ROUTINE CATEGORIES AND SUB-CATEGORIES | (Level - Descriptors) LEVEL(S) ATTAINED | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | Totals | Total % |
| Numeric: Recursive: | Next terms | $10^{th}$ or $20^{th}$ | $50^{th}$ term | $n^{th}$ term | Routines | |
| counting, | 499 | 267 | 6 | 0 | 772 | 53.3 |
| guessing & | 12 | 13 | 3 | 1 | 29 | 2.0 |
| check | 15 | 8 | 0 | 0 | 23 | 1.6 |
| chunking / Explicit: Solve equation Structural analysis Work backwards (Reversibility) | 79 | 210 | 237 | 43 | 569 | 39.3 |
| **Figural**: Proportioning Structural analysis | 8 | 5 | 2 | 2 | 17 | 1.2 |
| | 0 | 0 | 0 | 20 | 20 | 1.4 |
| | 0 | 0 | 0 | 13 | 13 | 0.9 |
| **Unclassified others** | **1** | **2** | **4** | **0** | **7** | **0,5** |
| **TOTAL** | **614** | **505** | **252** | **79** | **1450** | **100** |

In the study, data instances revealing numeric generalization routines far exceed other routines. As such the focus of our analyses is based on numerical generalizations. This does not mean that the other trends and routines from the data were not given attention - there was also interplay among the numeric, figural and pragmatic forms of generalizations thus some learners (high ability) used most of the routines featured in the three categories of generalization within a pattern problem as outlined in tables 2 & 3.

With respect to Table 3, the learners' procedures were dominated by numerical generalization which accounted for about 96 % (recursive + explicit). The figural, pragmatic and unclassified routines accounted for about 4%. However, the total number of routines identified from the data exceeded the expected number of responses from the entire sample because some participants used multiple routines within and across level(s). There were also a few instances where some sub-questions were not attempted at a particular level and it became very difficult to analyse (unclassified others). It also shows that 56.9% of the learners' overall numeric generalization routines were recursive while about 39.3% were from explicit approaches. The figural and pragmatic routines accounted for 1.2 % and 2.3 % of the overall routines respectively. The unclassified routines accounted for only 0.5 % of the entire data and were not categorized for analysis purposes.

However, what the quantitative analysis has not been able to show is the nature of learners' mathematical discourse in terms of their use of the specific routines in conjunction with word use, mediators and narratives. It is possible that some students were simply performing learned procedures (rote learning). Hence a qualitative analysis of the interview data where learners' mathematical discourse was explored is presented. The six learners interviewed in the study were coded as L5, L9, L15, L17, L23, and L28. The choice of these learners is discussed in detail in methodology chapter (see section 3.3). Some learners (L23, L28) coped very well with the questionnaire, others (L5, L9) had many difficulties with the questions, and yet others (L15, L17) were in between. The learners who coped well with the task belonged to the high ability group, those that experienced difficulties with the questionnaire based task were from the low ability group and then the last two learners who were classified as medium ability, their performance lie in between. The average percentage scores for each group (high, low and medium) were; 89 %, 41 % and 67 % respectively.

Some extracts of interview analysis from six learners' transcripts are quoted and reported in the following section. Learners' responses (written & spoken) to question number 3 did not provide rich data to analyse hence were set aside. For example:

**NOTE: Interpretations in the Transcriptions and Episodes**:
**R** represents the researcher; **L5** represents learner coded as number 5;
**[ ]** : Pause ; **{ }**: Learner counts or reads loud.

**Learner 5's extract episode 3 for question 4**
138  R:  Can you take me through your response first. And then tell me what you would do if there were 50 numbers and want to find the 50$^{th}$ term or number.
139  L5:  With 50 terms given as in part iii), I would probably....... I mean what I could have done is, ...., just look at 5 as for first number and then adding seven to second gives 12 at position 2, I will keep on doing this until I have the 50$^{th}$ term. *Routines, mediators and narratives*
140  R:  Why adding seven?
141  L5:  I can see that the numbers in the pattern are changing by seven in 4a and 5 in 4b. *routines and mediators only*
142  R:  Okay, are you talking about 4b as well?
143  L5:  Yeah. All these are similar sequences because they use numerical terms and I have to always start from the first number and see how to get the second or third, ..... etc. *mediators only.*
144  R:  Will you keep adding the five until 50$^{th}$ term in 4b?
145  L5:  Not really. But on the first question 50$^{th}$ term yes. I will add five but the pattern is decreasing, and its confusing. *Routines only*.
146  R:  Explain more about this adding of five

147 L5:  I mean 50<sup>th</sup> house = 50 + (-5)  = 55 + 5 = 55 : *routines, mediators and narrative*

148 R:  Why do you have minus five added to 50?

149 L5:  50 is the position of my lager value and minus 5 is what I will add ever time since the pattern is a decreasing one.  So in 4a, the 50<sup>th</sup> term is 50 + (7) = 57: *routines, mediators and narratives*

150 R:  Does this method always work for large values?

151 L5:  I think so. It should work as well for larger position numbers. *Words only*

152 R:  What will be the nth term in 4a and 4b?

153 L5:  In 4a, its n + (7) = 5 + 7 and in 4b I found it to be n + (-5) = n + 5 or n – 5. *Routines, mediators and narratives*

154 R:  Is (n + 5) the same as (n – 5)?

155  L5:  Yes, n stands for position of the term am looking for and 5 or minus 5 is just what I need to keep adding in order to get the next terms. *Routines, mediators and narratives.*

**Comments with regards to L5**

The analysis of episodes 1 - 3 shows that different types of visual mediators were used by learner L5 to communicate her ideas. These mediators include numbers, diagrams, algebraic representation and verbal explanations. The learner 's use of the mediators provided a means to understand the thinking process  the learner engaged in when generalizing from the number pattern task.

Learner L5 mostly used numbers as a form of visual mediators to communicate her thinking and ideas. Such an approach resulted to numeric generalization (episodes 1, lines 4, 6, 10 and episode 3, lines 147-9). On the other hand the learner used both verbal and algebraic representations to explain and communicate her ideas respectively (line 66 of episode 2, line 139 of episode 3). The algebraic expressions the learner is using are incorrect narratives as they do not generalize the number patterns in context (see line 153 of episode 3). The numeric representations were derived from diagrams drawn by the learner to extend a given geometric pattern before analyzing. The use of diagrams or pictures in this case provided access to numerical generalization.

A noteworthy finding in learner L5's use of verbal explanation is a mismatch of the numeric and algebraic representations when establishing a generalization. Also the analyses show that her use of the verbal explanation helped in supporting as well as interpreting the use of other mediators when representing their generalization. Learner L5 used recursive methods when generalizing from the number pattern task. These methods include counting and guessing and fall under numeric generalization category (episode 1, line 10; episode 3, line 147). This learner applied the incorrect narratives in most of her responses (see the n<sup>th</sup> term formulae, episodes 2 & 3, lines 74, 135 respectively). The learner has misconceptions about the formulae that can be used to derive general rules for any given pattern. This is manifested in the way she incorrectly situated the operational signs + or/and – among the algebraic symbols (line 74 of episode 2).

**Discussion and findings**

This study set out to explore grade 9 learners' algebraic reasoning as they generalize from numeric-geometric number patterns. It focused mainly on the routines that the grade 9 learners employ, and how they represent their responses when communicating ideas and thinking (i.e. mediators and narratives) when generalizing from number patterns. In this report, participants' responses have been organized and discussed according to a *commognitive perspective*. In the analyses, we examined the participants' routines, mediators and narratives as the main features of a discourse using the analytic tools developed for the study.

**Participants' commonly used routines and mediators**

Many of the learners' routines identified in the present study have been found in previous research studies on number patterns. The generalization routines that we have categorized as numeric (i.e. recursive and explicit methods) corresponds to what Stacey's (1989) and Orton and Orton's (1994) categorize as counting, difference, whole object, and linear methods. What we have categorized as figural and pragmatic generalizations corresponds to recursive and functional strategies as identified by Swafford and Langrall (2000). The findings of the study show that the participants' routines do not come into their minds in a straightforward manner regardless of the clues embedded in the number pattern context they engage in. For example, participants who are able to predict further numbers in the pattern tend to express their manipulations algebraically, to recognize equivalent expressions, and to use algebraic rules in solving problems associated with the number patterns.

The routines that the participants of the study employed mostly fell into the category of *numeric* generalization which includes *recursive* and *explicit* routines. The learner was considered to approach the task recursively when s/he demonstrates counting, guess and check or chunking methods. Most learners were able to determine the next few terms recursively but not the rule for the $n^{th}$ term. As most learners used recursive-counting methods at some stage, it is important to take advantage of the learners' abilities to employ recursive thinking to communicate ideas and work to expand this into algebraic reasoning. Current studies show that learners' strategies (routines) can provide useful information for classroom pedagogy. For example, learners use different routines when they generalize linear situations (Healey & Hoyles, 1999, 2000; Stacey, 1989, Swafford & Langrall, 2000 and Lannin 2005). It is not surprising that *recursive* approaches dominated other routines when learners generalize from number patterns. The findings also relate to other studies' (e.g. Macgregor and Stacey, 1993) which reveal learners' tendencies to generalize recursively rather than to use explicit approaches. An interesting observation is that most learners who relied on recursive methods did not attempt to determine a $50^{th}$ term or they gave incorrect responses. There were also a few instances in which recursive and explicit methods were employed simultaneously at some levels; this often resulted in correct responses (see interview analyses). The success of some learners in generalizing number patterns can be partly attributed to the nature of the questions in the task. All the questions in section A were linear-geometric patterns of the form $y = mx + c$ while section B of the questionnaire task (not part of this study) consisted of non-linear pattern questions. Concerning linear patterns, Stacey (1989) distinguishes between what she calls "near generalization" tasks in which finding the next pattern or elements can be achieved by counting, drawing or tabulating and "far generalization" tasks, in which finding a pattern requires an understanding of the general rule.

However, it is difficult to predict from these results if the learners would show the same or similar generalization routines when they are presented with non-consecutive figural or pictorial terms in a pattern instead of the three consecutive terms as in the study's questionnaire-based task. Although this scenario is not the focus of this study it might be interesting to explore or learn from other studies on issues associated with instructional design. What is not clear also is how these generalization routines affect the development of algebraic reasoning. Furthermore, many learners grappled with generating rules using the symbols where some had difficulty with which letters or symbols to use and their interpretation. The purpose of using algebraic representation was perceived by many participants of the study as a means to perform some manipulations to get an answer. Such perception implies that the use of algebra as a means of expressing generality was non-existent in their routines. The analysis of the participants' forms of representations has taught me that the use of different representations in mathematics is not as important as linking and translating the representations within and across contexts correctly. Making connections between different mathematical representations is an issue of conceptual understanding and was not fully explored in this study. For example, in episode 11, line 66, L28 justifies how she generated $T_n = 3n +$

2, a rule of generality for the tiles problem in the task. Through the use of recursive and explicit routines mediated by numeric and algebraic representations, L28 was able to produce the correct narratives. She also demonstrates her relational/functional reasoning by recognizing in/dependent variables in play when carrying out manipulations. She reckons that the representations $T_n = 3n + 2$, 3x1 + 2; 3x2 + 2; 3x3 + 2; ....... and 5; 8; 11; ...... are equivalent expressions as they mean the same number pattern.

The results on the use of mediators are in line with Lannin's (2005) findings that suggest many learners' inability to work simultaneously with multiple representations. The study by Gagatsis and Elia (2004) found that pupils tend to experience difficulties in transferring information across contexts rather than within contexts. For example, the numeric pattern in question 4 was found to be tackled with greater success by some learners compared to the corresponding patterns in questions 1, 2 and 3. During the analysis of the learners' data, in many instances the transition from arithmetic to algebra was observed to be either too abrupt or non-existent probably due to the fact that these participants were more familiar with manipulating numeric representations from school mathematics textbooks than other forms of representation. The mathematics curricular and textbooks from early grades arguably need to take a symbiotic approach to arithmetic and algebra. Separating the algebra and arithmetic makes it more difficult for the learners to learn algebra especially in later grades. A broader conception of algebra emphasises the development of algebraic reasoning and not just being skilled in algebraic procedures. Development of algebraic reasoning is generally reflected in the students' ability to generate, represent, and justify generalizations about fundamental properties of arithmetic (Ndlovu, 2011).

**Conclusion**

In response to the first question about the routines and visual mediators grade 9 learners use when engaging in a task on number patterns, the results show that many participants in the study implemented routines and mediators that were largely unrelated and inadequate to create endorsed narratives. Secondly, the qualitative analyses of the six participants interviewed, focused on their articulation when justifying both their written and spoken responses. Hence most learners' use and interpretation of the mediators to communicate their reasoning about the task is inadequate. The notion of mathematical language and Language of Learning and Teaching (LoLT) emerges as a potential area of further enquiry. Most of the interviewed participants' oral [spoken] explanations were inadequate to support the kind of the mathematical narratives they produced consequently were not endorsed as narratives.

The results of this study provide a guide for both the curriculum and classroom instruction design on the use of number patterns for introducing algebra in the junior high school grades. As such, we recommend that teachers should be aware of and appreciate the students' diverse routines and mediators use when generalizing from number patterns as these could have direct pedagogical implications in a mathematics classroom. Future research needs to further investigate learners' ability to reason mathematically by integrating algebra with other mathematical content areas (topics). Alternatively, as given that the routines and mediators investigated in this study seem to be intertwined, further research is needed to explore which generalization routines and mediators successfully lead students to developing general algebraic ways of thinking.

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# MATHEMATICS TEACHERS' KNOWLEDGE OF LEARNERS' DIFFICULTIES DURING CLASSROOM PRACTICE IN TEACHING STATISTICS.

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**Abstract**

Pedagogical content knowledge (PCK) comprises of subject matter content knowledge, knowledge of instructional skills and strategies, conceptions in statistics teaching, and learners' learning difficulties. This study focuses on the knowledge of learners' learning difficulties for teaching statistics. Data was collected from six mathematics teachers using teacher conceptual knowledge exercise (CKE) in statistics, senior certificate results in mathematics for at least two years, reports from subject advisers at the department of education, peers and Principals of secondary schools where these teachers are teaching. This study adopted a qualitative research method. The data on teachers' knowledge of learners' learning difficulties were collected through a teacher CKE, lesson observation, questionnaire, teachers' written reports and document analysis. The result shows that the mathematics teachers possess varieties of specific mathematical knowledge (instructional skills and strategies) which they use to identify and address the learning difficulties in statistics teaching. The implications for mathematics teacher education programmes are also discussed.

## Introduction

In an effort to improve teaching and learning of mathematics, several studies have been conducted in the field of mathematics education towards the improvement at the secondary and primary school levels. Some of the aims of teaching and learning of mathematics focuses on enabling the learners to develop thinking and reasoning power of the learners and understand the contribution of mathematics to the development of culture and civilisation (NCTM, 2012, DoBE, 2013 and MoE, 2013). The teaching of mathematics also aims at preparing learners with a sound foundation needed in various professions such as engineering, banking, accounting, as well as scientist, statisticians etc. Consequently, the child has to be prepared for further learning in mathematics and the related fields. Therefore, school mathematics should also aim at preparing the learners for higher learning in mathematics (MoE, 2013).

To improve teaching and learning of mathematics requires the practicing teacher to explore various instructional skills and strategies for teaching mathematics (Ijeh,2013) so that learners can learn and understand during classroom practices. On the account of this, Shulman (1986),Plotz (2007) and Ibeawuchi (2010) noted that there is a mathematical knowledge which is necessary for teaching and learning of mathematics. Amongst these categories of knowledge, Shulman (1986) noted that pedagogical content knowledge (PCK) is one of them. In Schulman's conceptualisation of PCK, four key elements seem to be the central focus in his categorisation for the mathematical knowledge for teaching. The key elements were:

i)    Knowledge of the representation of the subject matter for teaching
ii)   Knowledge of relevant instructional strategies.
iii)  Knowledge of learners' conceptions (preconceptions and misconceptions).
iv)   Knowledge of learners' learning difficulties.

These four elements cover the views and constructs of PCK used by various researchers in this

domain, such as Jong (2003), Shulman (1986), Jong et al. (2005), Halim and Meerah (2002), Rollnicket al. *(*2008), Hill (2008) and Toerien (2011).

Jong (2003) also conceptualised PCK as an amalgam of subject matter content and pedagogy, which is uniquely the area of specialisation of teachers and their own special form of professional understanding for good teaching (Jong, 2003). According to him, PCK is specific to teaching and differentiates between expert teachers in a particular subject area and subject area experts (Griffin, Dodds&Rovengno, 1996). To illustrate, mathematics teachers differ from mathematicians, not necessarily in the quantity and quality of their subject matter knowledge, but more specifically in how that knowledge is organised and used (Cochram, De Ruiter& King, 1993). An experienced mathematics teacher's knowledge of the subject is organised from a teaching perspective and is used as a basis for helping learners to understand specific concepts. A mathematician's knowledge, on the other hand, is normally organised from a research perspective and is used mainly as a basis for developing new knowledge in the field. This implies that PCK may be something beginners or inexperienced teachers may not necessarily learn only from textbooks or from short courses. From the literature reviewed, little is known as to how PCK is developed, or even facilitated, in the context of addressing learners' learning difficulties in statistics teaching (Godino, Batenero, Roa&Wilhelmi, 2011; DoE 2008; Jong, 2003). Therefore, further research is needed order to identify and define the skills, knowledge and practices necessary for addressing learners' learning difficulties in statistics teaching (DoE, 2008).

But Ijeh (2013) conceptualised PCK to include subject matter content knowledge, pedagogical knowledge (instructional skills and strategies), knowledge of learners' conceptions and knowledge of learners' learning difficulties (Ijeh, 2013). This conceptualisation is similar to that of Shulman (1986). However, the focus of this study is on the knowledge of learners learning difficulties which the mathematics teachers possess and demonstrate during classroom practice. Therefore the question is: What knowledge of learners' learning difficulties do mathematics teachers have and demonstrate during classroom practice?

### Conceptual framework

At the secondary school level, mathematics is taught under the following headings: Number system; space, shape and measurements; functional relationships and data handling (statistics and probability) (DoBE, 2013). The focus of this study is on data handling involving probability and statistics. The learning outcomes required that learners should be able to use appropriate measures of central tendency and spread to solve probability and statistical related problems (DoBE, 2012). Consequently, the practicing teachers are required to design good teaching and learning instructional skills and strategies that will take into consideration the learning outcomes of the topics as well as how the learners' anticipated learning difficulties can be identified and addressed.

Instructional skills and strategies, learning difficulties and misconceptions are some of the components of pedagogical content knowledge that are used in teaching a particular topic in a specific subject area (Jong, 2003 and Shulman, 1986). Penso (2002) conducted a study on the PCK of pre-service biology teachers, with the emphasis on how student teachers identify and describe learners' learning difficulties. The teacher used classroom observation and learners' diaries to collect data from the participants. Penso (2002) findings showed that learning difficulties could be identified and described during teaching and by observing lessons. Penso (2002) claimed that these difficulties may originate from the way the lessons are taught, which involves the content of the lesson, lesson preparation and implementation, and the learning atmosphere. Other factors include the misconceptions that the learners and the teachers have about the topic, and the cognitive and affective characteristics of the learners.

According to Penso (2002), learners consider their learning difficulties to be due to conditions prior to the process of teaching and those existing in the course of teaching. While the aspect of lesson content relates to the level of difficulty and abstraction of the topic, the teaching, lesson preparation and implementation aspects are concerned with the structure and presentation of the lesson (Cazorla, 2006). Negative lesson structure conditions include overloading content and unsatisfactory sequences in the lesson. Negative lesson presentation conditions include inappropriate instructional strategies for presentation, and not contributing to the process of learning. Negative cognitive and affective characteristics entail lack of prior knowledge about a topic that would enable learners to cope with the lesson in a meaningful way, preconceptions developed by the learners because of previous experiences, partial and inconsistent thinking, and lack of motivation and concentration. These negative cognitive and affective characteristics may result in learning difficulties in a teaching and learning situation if the teacher does not have adequate prior content knowledge of the topic.

Cazorla (2006) researched the way mathematics teachers teach statistics in elementary and secondary schools and teacher training colleges, and reported that mathematics teachers seemed to encounter some difficulties during teaching. According to this author, misconceptions and the way mathematics lessons are taught are among the factors that contribute to learners' learning difficulties in statistics. In addition, most statistics teachers do not have adequate knowledge of the curriculum and the necessary approaches to the teaching and learning of statistics. This leads to poor content delivery in the classroom, and consequently affects learners' performance.

Jong (2003), in his research on exploring science teachers' pedagogical content knowledge, used a teacher's log, concept mapping, interviews, and notes in order to identify and resolve misconceptions and learning difficulties. Convergent and inferential techniques may also be used by the teachers during classroom practice. Convergent and inferential technique is a data collection techniques in which questions are developed in short-answer and multiple-choice formats to probe the preconceptions and misconceptions of learners in a topic (Jong, 2003). The gap in this study is that lesson observation could have been used to determine how teachers use their PCK to identify the learning difficulties, if any, during the lesson.

From the above illustrations, it is evident that inadequate subject matter knowledge and inappropriate instructional strategies employed in classroom practice can bring about misconceptions and learning difficulties among learners in statistics teaching. However, learning difficulties can be resolved if practising teachers have developed adequate PCK to solve them, which, in turn, can lead to improved learner achievement. In this study, the teachers' knowledge of learners' learning difficulties was assessed through lesson observation, questionnaires, teachers' written reports and document analysis. A clear knowledge of how the practicing mathematics teachers identify and resolve learners' learning difficulties could depict their knowledge of learners' learning difficulties in statistics teaching.

## Methodology

This study adopted survey design. The methodology for the study consisted of two phases. In the first phase, six teachers were identified through interview with other mathematics teachers in the same department and principals of the school. The identified mathematics teachers undertook a writing exercise that assessed their conceptual knowledge of statistics. The results of this exercise were used to select the four best-performing teachers for the second phase of the study.

The second phase consisted mainly of lesson observation, teachers' interviews, questionnaires, written reports and document analysis designed to produce rich detailed descriptions of participating teachers' PCK in the context of teaching data-handling concepts at school level. The

qualitative data obtained were analysed to try to determine individual teachers' content knowledge of school statistics, related pedagogical knowledge, and how they gain knowledge of learners' learning difficulties in statistics teaching. The analysis was based on iterative coding and categorisation of responses and observations in order to identify themes, patterns and gaps in school statistics teaching. Commonalities and differences, if any, in the PCK profiles of the four participating teachers were analysed and determined in order to capture how the teachers identify and address learners' learning difficulties in statistics teaching.

## Results and discussion

The lesson observation, teacher interview, questionnaire, written reports and documents analysis were used to determine how the participating teachers develop knowledge of learners' learning difficulties in statistics teaching. The participating teachers were named Teachers A, B, C and D. From the lesson observation reports, all the participating teachers adopted the monitoring and analysis of learners' responses to classwork to identify any misconception and learning difficulty that the learners experience during their lessons on statistical graphs. Now let us take the teachers one after the other to see how they developed knowledge of learners' preconceptions and learning difficulties in statistics teaching.

### *Teacher A*

During lesson observation, teacher A taught histogram and box-and-whisker plots. Teacher A's knowledge of learners' preconceptions and learning difficulties of the statistics lessons observed was derived largely from what transpired in the classrooms, notably through his analysis of learners' responses to teacher classroom questions (oral probing questioning and pre-activities) and classwork or assignments. During the lessons, Teacher A was able to identify some of these difficulties or inaccurate conceptions – such as the learners' inability to select appropriate scales for labelling the data axis of the histogram (Figure 1) correctly through monitoring learner activity and questioning.

**Figure 1: An example of an incomplete classwork exercise on histogram construction and a histogram drawn with wrong scale**
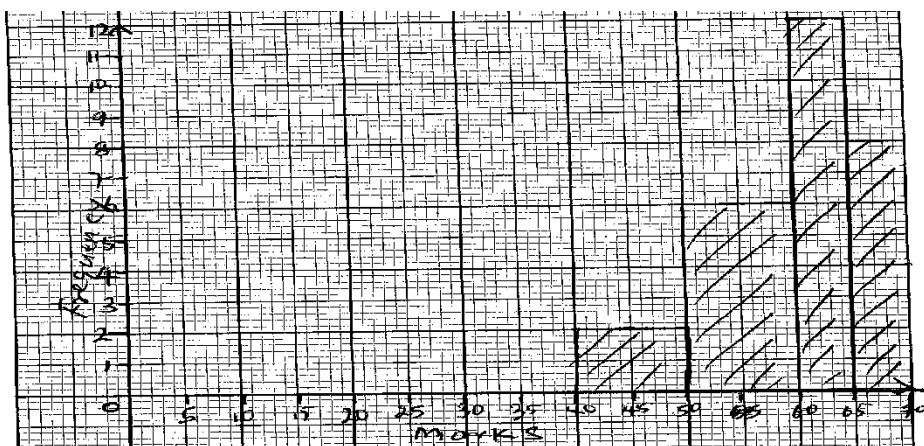


In the lessons observed, for instance, the teacher did not display evidence of anticipating learners' potential difficulties with any of the topics. The teacher went into the lessons without necessarily having prior knowledge or expectations of the type and nature of learning difficulties that his learners were likely to have in teaching histogram construction. For example, at the beginning of the lesson on histogram construction, Teacher A requested learners to define mode, median and mean.

The learners did so efficiently, based on knowledge that they had been taught. Thus the teacher detected learners' previous knowledge instead of preconceptions. Since the teacher could not identify their preconceptions of histogram construction, learners were likely to experience misconceptions and learning difficulties such as constructing a bar graph instead of a histogram because of their poor background in scaling (Figure 1). Teacher A can therefore be said to have displayed insufficient PCK in terms of the knowledge of learners' preconceptions of histogram and box-and-whisker plot construction.

Teacher A could have addressed possible learning difficulties before or during the lesson if he had had sufficient knowledge of learners' preconceptions of histogram construction. When asked in the questionnaire about his expectations of learners' difficulties, he said merely that there were no major problems, but he will deal with it if any difficulty arises. The insufficiency or inadequacy of his PCK in terms of his insight into learners' preconceptions was a knowledge deficit that was common to all the four teachers that were studied. The finding justifies further investigation into the reasons that teachers, in spite of many years of teaching experience, do not seem to give much thought to possible misconceptions or alternative frameworks their learners are likely to bring with them when they first come across new topics.

Penso (2002) noted that learners' thinking and prior knowledge of a topic is an important aspect that should be taken seriously into consideration during teaching as it helps to avoid possible learning difficulties that learners may encounter during the lesson. Penso (2002) suggested that during their lesson planning, practising teachers should be encouraged to explore varieties of instructional strategies that could elicit learners' thinking and prior knowledge of the concept being taught in order to be able to deal with their learning difficulties effectively. Hill *et al* (2008) note that the sequence of teaching and learning may be distorted if learners' preconceptions are not identified in order to address learning difficulties that learners are likely to encounter during teaching.
Teacher A addressed the learning difficulties through individual after-lesson or post-teaching discussions, including additional exercises that were given as homework. In his interview and written reports, the teacher confirmed the use of oral questioning, classwork and homework assignments as strategies that he purposefully uses to evaluate how well learners have understood the lesson and to gain insight into their pre-existing knowledge of histogram and box-and-whisker plot constructions.

In sum, Teacher A used several instructional strategies of oral questioning, using contexts and examples familiar to learners to introduce a topic, checking and marking learners' classroom and homework assignments, as well as using content-specific rule-oriented graphing skills (drawing axes, choosing scale, labelling axes, plotting points and joining line of best fit) for constructing histograms. By identifying learners' learning difficulties, using diagnostic questioning and monitoring techniques (already indicated), Teacher A can be said to have used effective pedagogical strategies to elicit learners' difficulties. But these monitoring strategies were not usually followed up with probing questions to determine the sources of difficulty or of incorrect preconceptions.

**Teacher B**

Teacher B taught graphical constructions of bar graphs and ogives according to the learning outcomes of data handling as stated in the mathematics curriculum (DoBE, 2010). Teacher B's assumed PCK on bar graphs and ogive constructions could be characterised as procedural in terms of his lesson planning and teaching approach.

During the lesson, Teacher B identified the learners' inability to label the data axis of the histogram correctly by monitoring and analysing their responses to classwork. In one example, the learners

chose the scale of grouped data and labelled the axes for data values incorrectly (Figure 1). as in the case of teacher A. Teacher B addressed such learning difficulties through extra class activities in the form of drills and practice, as well as individual post-teaching discussions after formal classes. The use of classwork and homework to evaluate how well learners had understood the lesson was confirmed in the teacher's responses to the questionnaire, documents analysis and written reports.

In terms of his knowledge of learners' learning difficulties, Teacher B was able to detect the misconception and learning difficulty of drawing a histogram instead of an ogive (Figure 3). For example, the students were asked to construct an ogive of the age group distribution of the users of multivitamin supplements using Table 1.

**Table 1: A table showing the age distribution of the number of persons using multivitamin supplements**

| Age group | 0 - 9 | 10 - 19 | 20 - 29 | 30 - 39 | 40 - 49 | 50 - 59 | 60 - 69 | 70 - 79 | 80 -89 | 90 - 99 |
|---|---|---|---|---|---|---|---|---|---|---|
| Cum freq | 0 | 5 | 8 | 10 | 13 | 18 | 6 | 5 | 1 | |
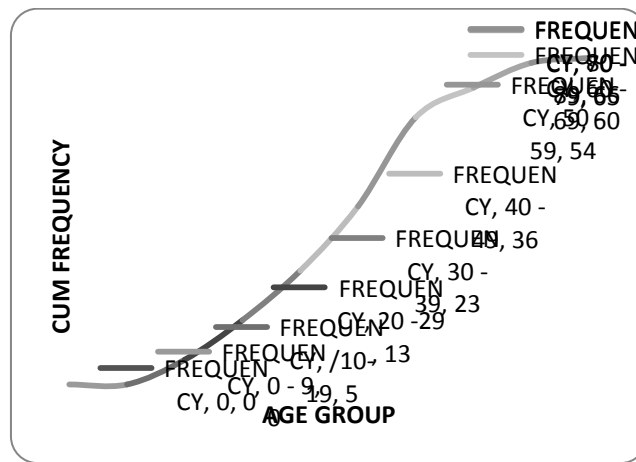


**Figure 2: Correct diagram of ogive showing the distribution of the number of age group using multivitamin supplements**
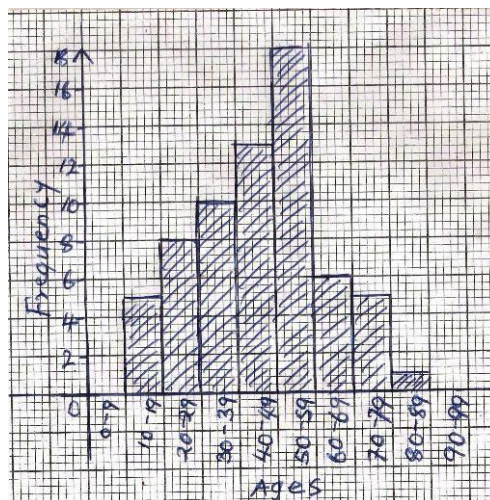


**Figure 3: Learners drew histogram instead of ogive**

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This misunderstanding could have been because of insufficient explanation of the construction of bar graphs and ogives via the procedural knowledge approach. As explained earlier, these learning difficulties were discovered while monitoring and analysing the learners' responses to classwork on bar graph and ogive. These problems were addressed by re-demonstrating the construction of bar graphs and by using extra class activities in the case of the ogive. The teacher interview, questionnaire, written reports and teacher's portfolios confirmed that learners had difficulties with the construction of graphs of grouped data such as the ogive.

In terms of his knowledge of learners' conceptions (preconceptions and misconceptions) in statistics teaching, Teacher B tried to identify them from pre-activities and oral probing questioning. Learners' demonstrated previous knowledge of frequency tables and how data is represented by preparing the frequency table efficiently and explaining the way in which data is represented, but the strategy that was adopted failed to elicit learners' preconceptions of bar graph construction. In other words, the teacher therefore displayed insufficient knowledge of the learners' preconceptions of bar graphs and ogives. Learners experience misconceptions and learning difficulties, such as an inability to label the data axis due to incorrect scaling during the construction of ogive (as in Figure 1) when the procedural knowledge approach was adopted to teach ogive construction. Teacher B would have been able to tackle this learning difficulty had the learners' preconceptions had been detected at the beginning of the lesson. When asked what learning difficulties did the learners experience during the lesson? He indicated that learners could not choose a scale of grouped data, revealing that their learning difficulties may have emanated from the teacher's insufficient knowledge of learners' preconceptions.

Inadequacy of knowledge of learners' preconceptions appeared to be common to all four teachers observed during the case study period. This finding points to a further investigation into the reasons that teachers with so many years of experience do not possess the knowledge of learners' possible preconceptions that may be necessary for effective teaching in the topics. Hill *et al* (2008) note that the sequence of teaching and learning may not lead to easy understanding of a concept and may not permit effective teaching if learners' preconceptions are not detected at the beginning of the lesson. Penso (2002) opines that teachers should consider several opportunities to detect learners' prior knowledge of a topic in their planning so that the anticipated learning difficulties can easily be addressed during lesson planning and presentation. This is an important agenda for inclusion in mathematics teachers' education programmes to ensure continuous improvement of PCK in statistics teaching.

How then does Teacher B develop his knowledge of learners learning difficulties in statistics teaching? In his teaching he did not demonstrated sufficiently a good grasp of the various topics of bar graph and ogive construction related to school statistics because his teaching was dominated with a procedural knowledge approach. The continuous use of this approach resulted to more questions from the learners during and after the lesson seeking for clarity of the misconceptions and learning difficulties they have encountered.

Teacher B attended workshops organised by his educational district office. As in the case of Teacher A, most of these workshops dealt with aspects of how to teach various mathematics topics that are considered difficult to learn, such as data handling, analytical geometry and trigonometry. The workshops sometimes appeared not to consider different aspects of teacher knowledge of learners' preconceptions and sources of learning difficulties in statistics teaching. But if they did, the teacher did not demonstrate their potential usefulness of the workshop in planning his lessons as the

participating teachers were unable to demonstrate their knowledge of learners' anticipated learning difficulties of statistical graphs. Teacher B appears to have limited knowledge of learners' preconceptions that could have been used in teaching bar and ogive construction as well as identifying learners learning difficulties. Therefore, Teacher B may have develop his knowledge of learners' learning difficult through the use of pre-activities and oral probing questioning to identify their difficulties in statistics teaching and addressing the difficulties by re-demonstrating the construction of bar graphs and by using extra class activities in the case of the ogive.

**Teacher C**

During classroom practice, Teacher C taught his planned lessons on ogives and scatter plots as laid out in the work schedule (DoBE, 2010). He used the recommended and supplementary mathematics and statistics-related textbooks as sources of information for planning and teaching his lessons on data handling (statistics).

Teacher C gained knowledge of learners' preconceptions and learning difficulties mostly during classroom practice. The results of this study show that he had limited knowledge of learners' preconceptions. As observed, learners revealed previous knowledge of ogives and scatter plots from their responses to homework on these topics. For instance, at the beginning of the lesson on scatter plot construction, he checked and marked learners' homework on scatter plots based on their previous knowledge of what they had been taught and corrected some of their errors. While he was doing the corrections, he did not display any indication of having knowledge of other anticipated learning difficulties. Instead, he presented the correction procedurally, with no emphasis on the way in which previous errors that learners had committed could be avoided during the lesson or subsequently. Learners' learning difficulties led to Teacher C having to provide corrections to the homework. This leads one to the conclusion that he may not have considered identifying learners' preconceptions in scatter plot construction. This information should have been used in planning the current lesson and avoiding probable learning difficulties. The learning difficulties (constructing a histogram instead of an ogive, as in Figure 3, and misinterpreting negatively correlated scatter plots (Figure 4) as having no correlation due to an outlier) that were identified through monitoring and analysing the learners' responses to classwork would have been taking into consideration during lesson planning on scatter plot construction. Their inability to label the data axis due to incorrect scaling was identified by oral questioning from the learners.
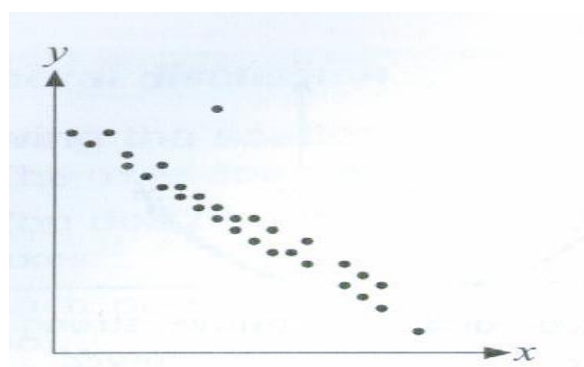


**Figure 4: A negatively correlated scatter plot**

Penso (2002) opines that practising teachers should be encouraged to consider learners' thinking and prior knowledge in lesson planning to avoid possible learning difficulties that learners may experience during lesson. Hill *et al* (2008) also reported that the sequence of teaching and learning may be altered if learners' prior knowledge is not considered during lesson planning and presentation. Teacher C addressed the learning difficulties by using a conceptual knowledge

approach, and reviewing the learners' homework to reinforce their understanding. He also conducted post-teaching discussions during and after ogive and scatter plot construction lessons.

The difficulties in terms of labelling the data axis of grouped data graph incorrectly were confirmed through analysis of the learners' workbooks, as well as the teacher's responses to the questionnaire and written reports in which he indicated that he identified learners' learning difficulties on graphs of grouped data through analysis of their classwork, homework and assignments. The learners, however, still followed the teacher after the lesson on scatter plot construction, demanding clarification about misinterpretation of a negative linear scatter plot that he had re-explained during the lesson (as in Figure 4). The teacher had evidently not addressed their learning difficulties sufficiently, which means that in teaching the construction of scatter plots his PCK was not comprehensive enough to cater for the learners' learning difficulties (Westwood, 2004). At this stage Teacher C did not exhibit enough PCK because his teaching could not cater for all the learners' learning difficulties in ogive and scatter plot construction. He subsequently addressed the learning difficulties experienced by the learners (such as misinterpreting a scatter plot because of outliers) in post-activity discussions, a strategy that he used frequently in his lessons (Figure 4). Capraro *et al* (2005) note that a competent mathematics teacher should be able to exhibit progressively more PCK in his or her lessons since he or she has acquired more experience from formal education programmes and should plan his or her lessons in a way that is designed to avoid any learning difficulty that learners are likely to encounter. By identifying learners' learning difficulties through monitoring and analysing learners' responses to classwork, Teacher C can be said to have knowledge of learners' learning difficulties. But these difficulties were not always followed up in terms of taking them into consideration when planning the next lesson in order to identify learners' preconceptions of the new topic.

**Teacher D**

In Teacher D's observed lessons, it was noted that he had planned and taught his lessons on bar graphs and histograms using the Department of Basic Education's mathematics work schedule, and the recommended textbooks as sources of information. Teacher D used a procedural knowledge approach more rather than a conceptual knowledge approach. His preferred use of this approach was confirmed in the document analysis conducted in Teacher D's learner workbooks. The learners had completed the diagrams on bar graphs and histograms efficiently, with indications of the procedures that had been adopted in constructing these statistical graphs. Star (2002) argues that it is important for practising teachers to possess both kinds of knowledge in order to impart teaching to the learners in a meaningful way.

Over and above this, Teacher D was able to identify learning difficulties experienced by the learners during the lesson and alternative conceptions from the various graphing exercises that were carried out by the learners. One such learning difficulty was their inability to choose the correct scale for labelling the data axis. This meant that they constructed a bar graph instead of a histogram. In this case, Teacher D may be said to have presented his lesson in a limited way. His lessons were dominated by procedural knowledge teaching without providing the reasons underlying such procedures. He may not have accommodated the possibility of anticipating learning difficulties during the lessons on bar graph and histogram construction in his lesson planning and presentation and resolving them. For instance, he indicated the scale for constructing a bar graph and how it was obtained without explaining his reasons for choosing it, which shows that he may have presented his lesson in a limited way. When the learners adopted the same procedure to construct the bar graph of the marks distribution of learners in a test during classwork, they did not consider the consistency of spacing in a bar graph, which resulted in a histogram instead of a bar graph (Figure 5).
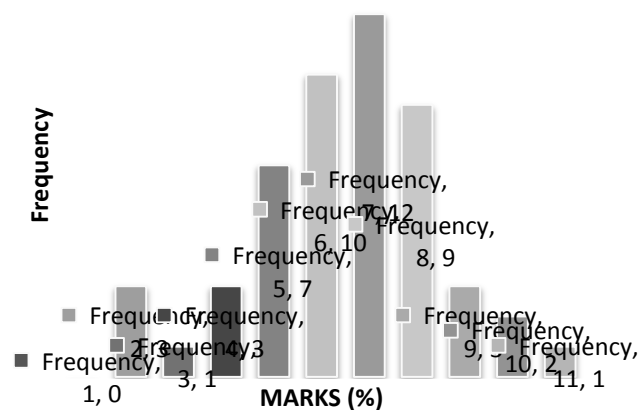
**Figure 4:  A bar graph showing the mark distribution of learners in a test**
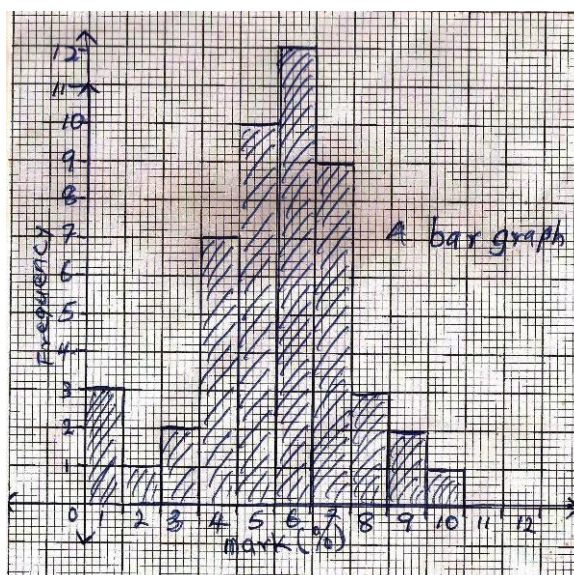


**Figure 5: Constructing a histogram instead of a bar graph**

The greater part of Teacher D's knowledge of learners' preconceptions and learning difficulties was gathered while teaching the assigned topic in statistical graphs. As observed earlier, during classwork the learners' inability to choose an appropriate scale for histogram and bar graph construction was identified through monitoring and analysing their responses. But the teacher did not display any evidence of having anticipated the learners' learning difficulties with bar graph and histogram construction, revealing that he may have gone into class without necessarily having knowledge of learners' possible learning difficulties in these constructions. To this end, Teacher D can therefore be said to have displayed insufficient PCK in terms of awareness of learners' preconceptions of bar graph and histogram constructions. From instance, at the start of the lesson, Teacher D requested the learners to prepare a frequency table of the makes of cars in a car park. The learners prepared the frequency table efficiently using previous knowledge. Thus, the teacher realised that the learners had previous knowledge that could be linked to bar graph construction, and no preconception was

identified. When asked about the learning difficulties that learners might have had or were likely to experience during his lesson, he indicated that although that the learners had problems in determining the mid points and constructing graphs of group data, he would deal with difficulties that might arise.

Inadequacy in teachers' knowledge of learners' preconceptions was common to the entire group of teachers involved in this study. This suggests the need for further investigation into the reasons that such teachers with many years of experience should have such a knowledge deficit in an area that is essential for effective classroom practice. As indicated in the section on Teacher A, Penso (2002) suggested that in their lesson planning, practising teachers should explore a variety of instructional strategies that would elicit learners' thinking and prior knowledge of the concept being taught in order to deal with their learning difficulties effectively. Hill *et al* (2008) note that the sequence of teaching and learning may by interfered with and possibly create opportunities for learning difficulties to occur if learners' preconceptions are not considered when planning and presenting a lesson.

Teacher D tried to address difficulties through extra explanations and homework assignments. The teacher questionnaire, written reports and document analysis confirm the use of pre-activities, extra explanations and class activities in the form of classwork and homework to evaluate how well learners have understood the lessons and to gain insight into learners' pre-existing knowledge of bar graph and histogram construction.

## Conclusion and recommendations

The most notable learning difficulty observed in the lessons of all four teachers was the inability to construct and interpret graphs of grouped data. The main challenge, in part, was owing to learners' inability to choose an appropriate scale. Second, the learners had difficulty in labelling the axes without proper scaling for constructing the statistical graph on the graph paper provided.

The teachers developed knowledge of learners' learning difficulties through analysis of their classwork, homework and assignments, as well as through post-teaching discussions on statistical graphs construction. Constant examination of the learners' workbooks helped to reinforce the teachers' insight into learners' conceptions (preconceptions and misconceptions) of statistics topics.

The teachers addressed these difficulties at various times through extra classes, problem-solving tasks using familiar real-life examples, post-teaching discussions, and teaching on a one-to-one basis after normal school hours. The process of identifying and addressing learners' learning difficulties should have provided the teachers with ample knowledge of learners' preconception and learning difficulties in statistics teaching. But it is surprising that after so many years of teaching mathematics, some of the teachers are not aware of these problems. This lack of familiarity with learners' anticipated learning difficulties could be because the topic was recently introduced into the curriculum. Therefore, the teachers may not have developed the required PCK for addressing the difficulties which learners' may experience in learning school statistics. However, by identifying and addressing learners' alternative conceptions and learning difficulties, the participating teachers may have gained more knowledge of the learners' learning difficulties in statistics teaching.

The study recommends that practising mathematics teachers should be encouraged to learn more about the possible instructional skills and strategies for identifying and addressing learners'

alternative conceptions in statistical graphs as well as incorporating them into lesson planning for effective classroom practice in mathematics teaching.

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# FACTORS CONTRIBUTING TOWARDS ACADEMIC EFFECTIVENESS OF SCHOOLS IN NGAKA MODIRI MOLEMA DISTRICT, NORTH WEST PROVINCE: WHAT ARE THEY DOING RIGHT?

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## Abstract

This study is aimed at examining factors that contribute to academic effectiveness of schools in Ngaka Modiri Molema district of the North West Province, South Africa. Literature gave clarity on the aspects such as academic effectiveness and those factors that contribute to effective learning in schools. Participants were 63 in all comprising 3 School Governing Body members 15 principals, 45 educators. There were 34 women and 29 men with ages ranging between 25 years and 44 years. Qualitative and quantitative research methods were used. Questionnaires were used to gather information from respondents. To corroborate the information in the questionnaire, interviews were also used A literature study was done to compare how different books addressed school academic effectiveness. From the data analysis, results indicated the following themes (a) effective schools (b), characteristics of effective schools and (c) learning in effective schools. The qualitative variable consisted of reasons for effective schools, namely (a) the need for strong leadership (b), educator qualification (c) availability of resources and (d) safety in schools.

## Introduction

An academic effective school is the one that provides the target group of learners with skills which allow successful access to the next level of learning (Teu, 1997). Education and training are decisive elements of the quest to build a winning South African nation that is why the government is focussing on education. It is generally believed that for a country to succeed in these times, it has to have an educated and skilled people who will be in a position to compete with relevant skills needed in these days. Due to the fact that, schools in Ngaka Modiri Molema district are rural, they face a host of challenges related to school management and school effectiveness. The district is made up of five Area Offices (sub-districts) namely Kgetleng, Ditsobotla, Mahikeng, Rekopantswe, Ramotshere Moiloa. Developing countries face many common problems in providing sufficient education of high quality to their learners (Robson, 1993). The new education system in South Africa requires leaders, managers and educators to work in democratic and participatory ways to build relationships as well as ensure efficient and effective delivery of education Department of Education (2003).This implies that in an attempt to establish a quality schooling system, schools should be led by principals who possess the capacity to stimulate others and who have a positive attitude towards developmental education. A school vision has to be accompanied by a practical ability to translate it into classroom practice for successful learning. There is an explicit suggestion that effective schooling enables learners to progress through the schooling system (Legotlo, 1994). All children can learn and they need assistance to learn effectively. To be able to achieve effective learning, appropriate educational structures and methods should be provided (Teu, 1997). This implies that for schools to be effective, they should have clear goals and objectives to be realised in educational institutions. An effective school should excel in learning processes. The yard stick used to determine how effective the school is; in most cases is the end of the year results. As earlier mentioned, Ngaka Modiri Molema district is viewed as a predominantly rural district where learning is possible through extra effort since the conditions in the area are far from conducive for learning. These among others includes problems like poor gravel roads, lack of infrastructure for example dilapidated school buildings with no chalk boards and no electricity. Most of the learners stay alone at home or with their siblings since their parents work in the mines or farms. The biggest problem is that parents seem not to be interested in the education of their children. Even under these conditions, schools are able to produce good

results. The common expectation will be that due to the above-mentioned conditions, there will be no effective schools there. These conditions prompted researchers to investigate factors that contribute to academic effectiveness of schools in Ngaka Modiri Molema district under the prevailing circumstances.

As a predominantly rural region, there were challenges with schools not performing to the expected standards. There are challenges like late arrival of learners due to poor transport and the biggest challenge being lack of resources like computers, libraries and laboratories that enhances education. The introduction of Revised National Curriculum Statement (RNCS) brought about change in the attitude that educators, learners, principals and communities had with education, Department of Basic Education (2011). Due to thorough workshops on RNCS there was a big change of attitude and the important stakeholders, that is, learners, educators and parents embraced the new order. This in a way brought about effectiveness in schools. Motivated educators went extra miles to see to it that learners did their utmost. Learners in schools in Ngaka Modiri Molema district of the North West province lives in conditions that one can consider to be poor. The reality is that most of the parents of these learners work in mines in Rustenburg and as such, they stay in mine hostels. Women mostly work in farms. The result of this economic demand is that learners are left alone at home while parents are out to work for them. In addition, these schools showed steady increases in achievement over time, and the achievement gap between learners from low socioeconomic and high socioeconomic backgrounds narrowed. The National Curriculum Statement (NCS) envisions educators who are qualified, competent, dedicated, caring and who will be able to fulfil various roles outlined in the Norms and Standards for Educators of 2000 (Department of Education, 1996).

**Literature review on school effectiveness**

Beare, Caldwell and Millikan (1989:15) explain effectiveness as follows "to effect" means to "bring about" to "accomplish", that is, the school must accomplish something. The term implies a deliberate action to accomplish something. The Effective Schools model of school reform is based on more than thirty years of research conducted nationally and internationally. This research identified schools in which learners were mastering the curriculum at a higher rate and to a higher level than would be predicted based on learners' family background, gender, and racial and ethnic identification.To be able to cater for the different needs of learners, schools should look at needs ecosystematically, which means that the learner should be seen in her/his different situation (Mmileng, 2003). The principal in an effective school has to provide leadership and encourage all members to work to the best of their abilities. Schools need effective leaders to communicate the school's mission and vision. By persistently reinforcing the school's mission, the principal creates a shared sense of purpose and establishes a set of common core values among the instructional staff. Having common core values and a shared sense of purpose helps guide all members of the instructional team and avoids individuals straying from the intended goals. In the effective school, the principal acts as an instructional leader and effectively and continually communicates the mission of the school to staff, parents, and learners. In addition, the principal understands and applies the characteristics of instructional effectiveness in the management of the instructional program. Clearly, the role of the principal as the articulator of the mission of the school is crucial to the overall effectiveness of the school (Lezotte, 2001, p. 5). The principal is not the sole leader; he or she is a "leader of leaders" (Lezotte, 1991, p. 3) empowering educators and including them in decisions about the school's instructional goals. "In order to achieve significant changes in classroom practice, educators must have an opportunity to participate in shaping a school's vision…" (Cibulka and Nakayama, 2000, pp. 5–6). Educators work together with the principal to ensure that expectations for student achievement are understood across classrooms and across grade levels. In addition, these schools showed steady increases in achievement over time, and the achievement gap between learners from low socioeconomic and high socioeconomic backgrounds narrowed.

When the school satisfy one part, for example, achieving higher academically and performing poorly in other activities like sports, such a school may not be regarded as being effective in fulfilling its educational mandate. For example, the South Africa Schools Act of 1996 state that a good school discipline is seen as enhanced in effective schools is an important feature of an effective school and consequently a school will be seen to be effective if learners are well behaved, disciplined, and respectful and show educational curiosity. The morale of school leaders, educators and learners is seen as enhanced in effective schools since it is a contributory factor to the effectiveness of the school. If the morale is high, it could be able to enhance school effectiveness.

Unique characteristics of the majority of effective schools are correlated with learner success. Because of this, these characteristics are called *correlates* by researchers (Lezotte 1991). Schools had to know that they would not be effective unless they have objectives or targets to achieve. The correlates are the means to achieving high and equitable levels of learners learning. It is expected that all children (whether they be male or female, rich or poor, black or white) will learn at least the essential knowledge, concepts and skills needed so that they can be successful at the next level next year. Further, it has been found that when school improvement processes based upon the effective schools research are implemented, the proportions of learners that achieve academic excellence either improves, or at the very least, remains the same. (Association of Effective Schools, 1996). Academically effective schools may be defined as the extent to which there is congruency between the school`s objectives and achievements, Mudaus *et al* 1980. They further maintained that an effective school adjusts to requirements to provide the necessary educational programme by obtaining the desired goals through adapting new methods and strategies. Effective schools are those schools which obtain a significant increase in their learner achievement (Teu, 1997). Effective schools are those schools in which all learners master basic skills, seek academic excellence in all aspects and demonstrate achievement through systemic testing. As a result of improved academic achievement, learners in academic effective schools display improved behaviour and attendance. In this study, an academic effective school is a school in which principals, educators, learners and school management teams (SMT), the SGB, the circuit manager, area managers and the district educational leadership are dedicated to work very hard and support each other on professional matters.

In an effective school, the educators and learners are allowed autonomy so as to be able to make decisions that are developmental. All these will be achieved if the staff is well qualified and diversified. All programmes in the school should be planned and they should be related to the vision and mission of the school. Teu (1997) agrees with this statements pertaining to leadership by maintaining that an effective school has a strong instructional leadership which has the ability to structure educators, in such a way that they could work as a unit all performing their duties.. In effective schools there is parental involvement and support, this parental participation is encouraged through statutory and non-statutory forums (Purkey & Smith, 1983). In effective schools, "parents understand and support the basic mission of the school and are given opportunities to play important roles in helping the school to achieve its mission" (Lezotte, 2001, p. 8). However, because so many ineffective schools are located in low socioeconomic areas, many of the parents of the children attending these schools may not be able to support their children fully in their academic activities (Goodman, 1997; Johnson, 1997). There is also recognition of academic success, that is, these schools openly emphasises academic performance and learners are expected to work hard to succeed. In the effective school, there is a climate of high expectations in which the staff believes and demonstrates that all learners can obtain mastery of the school's essential curriculum. They also believe that they, the staff, have the capability to help all learners obtain that mastery (Lezotte, 2001, p. 7). In high performing schools, learners are given challenging curricula and demanding tasks, and they are expected to succeed. High performing schools regard every child as an asset. Moreover, each child is considered to possess a unique gift to offer to society (Bauer, 1997, p. 2). (Teu, 1997) on the other hand maintains that school effectiveness is possible if there is safety

for both the learners and educators. In effective schools, "there is an orderly, purposeful, business-like atmosphere, which is free from the threat of physical harm. The school climate is not oppressive and is conducive to teaching and learning" (Lezotte, 2001, p. 6). The learners should feel comfortable and recognise their school as a safe place for them, so if they have any problems, they can talk to a teacher about it. The school premises have to actually be safe and more than just satisfactory.

 For the school to be effective there has to be a clear and well understood goals that are related to learning outcomes, experience, teaching in classroom, provision of resources and the management of the school. On the issue of learning time, Purkey and Smith (1983) are of the view that there has to be enough time for both teaching and learning. For schools to be effective, principals should not only demonstrate leadership in terms of concrete ideas and skills to implement ideas, rather, the principal must also make academic performance a priority by laying more emphasis on the instructional quality of teaching personnel Teu (1997). The concept of the involvement of the deputy head, involvement of educators and maximum communication between educators and learners is used by Legotlo (1994). Purkey and Smith (1983) maintain that for the school to be more effective, the deputy head should be at all times involved in policy decisions. The educators too have to be involved in curriculum guidelines. "In the effective school, pupil progress over the essential objectives are measured frequently, monitored frequently, and the results of those assessments are used to improve the individual student behaviours' and performances, as well as to improve the curriculum as a whole" (Lezotte, 2001, p. 8).  They maintain that there has to be good communication between educators and learners since it through communication that learners perform better. From the preceding discussion, it is clear that learners come to school to be taught the importance of involvement in meaningful work and to be assisted in developing task commitment characteristics. The seven common correlates include: Clear school mission, high expectations for success, instructional leadership, opportunity to learn and time on task, safe and orderly environment, positive home-school relations, and frequent monitoring of student progress. In effective schools, there is a collaborative planning and good collegial relationship, that is, educators plan together to make some educational scenery. A school should have a wide sense of community and individual`s sense of being a recognisable member of that community. In the effective school, there is an orderly, purposeful, business like atmosphere which is free from the threat of physical harm. The physical facility is clean, attractive, kept in good repair, and student work is prominently displayed. The schools atmosphere has to be orderly without being rigid, quite without being oppressive and genuinely conducive to the instructional business at hand.

It is very important for one to note that educators respect their profession and as such they want others to respect teaching. Educators like to work with and for principals who are considerate, supportive and fair in their treatment of others (Mmileng, 2003). This means that for educators to work towards the school`s mission and vision with dedication, the principal has to be considerate. Effective school leaders strive towards achieving objectives set in the school and that they are able to manage the people so that work is done effectively (van der Westhuizen, 1991).

**Method**

**Participants**
The targeted population comprised of educators and principals in schools in Ngaka  Modiri Molema district of the North West province. The region has 150 schools including primary, middle and high schools. To select participants, simple random sampling was used. The first aim was to select a sample of approximately 10% of the schools in the population. The 10% was seen to be an ideal number considering that the population of 150 schools would in essence have meant that there were 3 500 eligible participants. That number of participants would be difficult to reach. In selecting the 10% of the schools a table of random numbers was used and 15 schools were finally included in

the study. Initially, each school was given a number ranging from 1 to 150. The numbers were then defined in the Research randomizer (2011) which generated different sets, and set 6 was selected. In selecting the 15 schools, this meant that automatically the 15 principals were selected. In selecting educators from each school, the researcher assigned numbers from 1 to *n* (where *n* was the number of educators in a particular school) and the Research randomizer (2011) was used to select two. This therefore means that the sample was made up of 60 participants, comprising 45 educators as well as 15 principals. The 3 SGB members were from three local schools who were included in the sample whose matric results have significantly improved. Participation was voluntary because the purpose of the study was clearly explained to all possible participants. All questions and queries were addressed to their satisfaction. The respondents had their fears about the outcome of the study. Their concerns amongst others related to the questions they asked the researcher for example (a)…should I indicate my name on the questionnaire and will this paper be sent to the department of education?" (b)…will the principal know what I have said…?" and so on. Following this process, it was indicated to the participants that if they so wish, they could decline to participate.

## Instrument and procedure
In this study both qualitative and quantitative methods of collecting data were utilized. In essence this was a mixed methods study. It is averred that the goal "…of mixed methods research is not to replace either of these approaches but rather to draw from the strengths and minimize the weaknesses of both in single research studies … " (Johnson, & Onwuegbuzie, 2004, pp. 14 - 15). In the same breath, it has been pointed out that when the two methods are used in combination, the weakness of one could be balanced by the strength of the other (Robson, 1993). The aim of utilising both qualitative and quantitative methods here was to use these as some form of triangulating findings. This means that one method was used in some aspects of the study to verify and corroborate participants' assertions and views in the other method.

A questionnaire comprising two sections was used to collect data. The first section requested the participants to provide biographical data in terms of age, gender, highest academic qualification and work experience. The second section determined the views on the factors contributing towards academic effectiveness of schools in the Ngaka  Modiri Molema district. The questionnaire had open-ended questions with the aim that respondents could motivate the answers they have given. Interviews were also utilized to corroborate the responses in the questionnaire.

## Results

### Biographical  data
Participants were 63, they being 15 principals and 45 educators and 3 SGB members. Table 1 shows the biographical data that the participants were requested to provide.

**Table 1** Biographical information of the participants (N = 63)

| Category | N | % |
|---|---|---|
| *Gender* | | |
| Women | 34 | 54 |
| Men | 29 | 46 |
| *Age* | | |
| 20 – 29 | 11 | 17 |
| 30 – 39 | 22 | 35 |
| 40 + | 30 | 48 |
| *Highest academic qualification* | | |
| Grade 12 | 4 | 6,34 |
| Diploma (e.g. Diploma in primary | 16 | 25,39 |

| | | |
|---|---|---|
| education) | | |
| Degree or higher(e.g. B.A. or B.A. Honours) | 43 | 68,24 |
| *Position held in school* | | |
| Educator | 45 | 71 |
| Principal | 15 | 24 |
| SGB | 3 | 5 |
| *Teaching experience (Educators)* | | |
| 5 – 9 | 4 | 7 |
| 10 – 14 | 26 | 43 |
| 15 - + | 30 | 50 |

It may be observed from the table that the majority of participants were women (54%). Participants' ages ranged between 25 years and 44 years. The table further reveals that the majority (71%) of the participants had completed either a degree and higher. It is worth noticing that only one educator is not qualified (2%). Only (7%) had teaching experience of 9 years or less. One can also notice that majority of participants have teaching experience of 15 years and more. The picture painted here is that majority of participants have been in the teaching fraternity for ten years and more (97%). This means that educators had a long service and as such one may consider them to have enough knowledge in teaching and dynamics in the school.

**Deliberations on factors contributing towards academic effectiveness of schools in Ngaka Modiri Molema district**

In this study, reliability, which in social sciences usually referred to replicability of procedure or findings in quantitative methods and consistency in qualitative methods, was gained through method triangulation and triangulation within methods. Participants were initially given a questionnaire to express their views. It was then deemed necessary that interviews be utilised as a means of corroborating what was indicated in the questionnaires. Interviews were used to provide most of the information used to analyse the effects of the current school management strategies and principal characteristics of school effectiveness in Ngaka Modiri Molema district. Both instruments were used to actually have clear view and understanding of what the views of respondents were. Through the research process, the beliefs of the researchers, their political, religion and racial attitudes and other convictions play an underlying role, Robson (1993). For this research to be credible, the researchers put aside their political and religious convictions. The researchers in this study adhered to established conventions to ensure reliability.

The qualitative data was reduced to and presented by means of the following variables: (a) effective schools, (b) leadership in effective schools and (c) learning in effective schools.

**Effective schools**

There is a lot of orderliness that one can notice in an effective school. An effective school is one that gives its learners good resources and lets them achieve their full potential These variables as they appear in the questionnaire of this research have 5 questions on effective schools. The responses to those questions are that 90% of the respondents agreed that effective schools provide and stick to programmes. This was corroborated in interviews when respondents indicated that their schools use programmes like, Learner Attainment Improvement Plan (LAIP) (96 items) on monthly basis to assess school progress on the following: Curriculum Assessment Policy Statements (CAPS) training, workbook usage, Annual National Assessment (ANA) result, syllabus coverage, quality of written work and time on task. These are some of the programmes that make the district to achieve good

results. In most schools that are not academically effective, no programmes are provided that will help in making learners to achieve good results. On the issue of adoption of strategies and methods for schools` success, 94% of respondents agreed that effective schools adopt new strategies and methods for success of their schools. The strategies adopted, amongst others include monthly academic accountability session whereby educators of different learning areas have to account for poor results and those educators with good results to be commended and to share good practices with their colleagues. It has to be stated that schools that are not academically effective do not adopt new strategies and new methods of educating learners.

On the question of morality in the school, 64% of respondents agreed that learners and educators` morale is high. It has been realised that consistent visit by subject advisor and circuit manager to schools and picking areas of school non-performance has added to the morale of educators. Learners` morale is very low in other normal schools. Learners seemed not to be willing to go an extra mile in their learning. In schools that are not academically effective, one will find that educators are not mastering basic skills of educating. On the question of mastery of basic skills by educators 86% of respondents strongly agreed that all educators need to master basic skills for the school to be effective. In the interviews, this response was corroborated by statements that afternoon classes and extra classes during weekends, including subject advisors and circuit manager visits at school improved the basic mastery of skills of educators which ultimately made learners to do even more. On the issue of congruence between school`s objectives and its achievements, 84% of the respondents agreed that there has to be congruence between the school`s objectives and its achievements.

**Leadership in effective schools**

In the effective school, the principal acts as an instructional leader and also empowers and helps educators to become collaborative leaders in continuous improvement. He or she effectively and persistently communicates the school's locally-developed mission to staff, parents, and learners (Botha, 2004). The effective principal also understands and applies the characteristics of quality instruction and assessment in implementing programs and evaluating classroom instruction. On the variable on characteristics of effective schools, it is found that 84% of respondents agree and strongly agree that an effective school has a strong instructional leader. Principals' accountability session are held quarterly whereby principals account for poor performance of their school. This makes principals to be vigilant and see to it that educators do their work and learners benefit.

 In actual fact, some schools that are not academically effective one will find that those schools have leaders who are not focused; hence weak leadership produces poor schools. There is an expectation that a safe school is conducive for education. In other provinces in South Africa there is lack of safety in schools hence the schools are not academically effective. On the second item which was on the question of a safe and orderly environment, 68% of respondents agreed that an academically effective school has a safe and orderly environment. In Ngaka Modiri Molema this, was achieved through implementation of departmental safety strategies, 63 Schools were visited to monitor the implementation of safety strategies as outlined by the Department. On the other hand, area managers, circuit managers and principals of secondary schools in the five area offices of Ngaka Modiri Molema district were trained on school Law. 213 out of 415 schools had established the school safety committee and 379 schools out of 415 in the district have adopted cops who act as custodians of the law. To make schools havens for learning, campaign on stop rape and violence against women and children was conducted by Department of Education Ngaka Modiri Molema Distrct and South African Police Services National from the 05th-06th/03/2013 where schools of different categories were covered.

 In some schools, educators are not sure of the outcome of the learner achievement. This is different in academically effective schools. On the question of what educators expects of their learners, 84%

of respondents agreed that in an effective school, educators have high expectations on learner performance.

One common practice in schools is that learners` work is not always assessed. This make learners not to take their work seriously hence poor results at the end of the year.96% of respondents to the question on learner progress agreed that in effective schools learners` progress is frequently assessed. For the improvement of results, it was realised that the Annual National Assessment (ANA) exam guidelines gives a clear indication on which sections will be included in the exams and it is also geared towards the time period when ANA will be written. Educators in Ngaka Modiri Molema stated that learners` progress is frequently assessed and a report-back is always given to them since this help them to know their weak points and how best to improve. The new dispensation came up with management ideas that make schools to be run like business entities. Among others they brought about mission and vision as things that can make school management to focus and know what means they can use to make their schools effective. Some school ignore these missions' visions therefore they produce bad results at the end of the year. On the question of school mission and vision, 94% of respondents agreed that effective schools have a clear school mission and vision.

On the question of curriculum, 92% of respondents agreed that an effective school has a planned and purposeful curriculum. In the effective school, student academic progress is measured regularly and rigorously by a variety of appropriate assessment procedures. The results of these assessments are used to improve both individual student performance and the instructional program. Learners` mastery of the adopted curriculum standards is determined through these assessments, and progress reports are made available to educators, parents, and older learners on a regular basis. On the question of parental support and involvement 68% of respondents agreed that an effective school has a strong support from the parents. On the question of educator development, 90% of respondents agreed that in an effective school, staff members are always developed. On the question of feedback on performance, 94% of respondents agreed that in an effective school there is always feedback on performance.

**Learning in effective schools**

A school is often thought of as effective if it has good average results for exams. However, an effective school needs more than that. The learners have to be regularly involved in the classwork, not just always writing down what the educator says, they should enjoy and look forward to lessons, the educators should use different methods for teaching learners, the learners should also be taught how to be good citizens, friends and daughters and/or sons, by being made aware of the effects of their actions on everyone they meet. On the question of what knowledge of teaching and learning do educators have, 100% of respondents agreed strongly that knowledge of teaching and learning promotes effectiveness, this the district used the services of University of North West to train all under qualified educators. Principals were also encouraged to do management and leadership courses with university of the North West with no charge to them. 92% of respondents agreed that an educator is the key factor to learner achievement. On the question of quality of teaching and learning, 90% of respondents agreed that teaching techniques promotes academic school effectiveness and 88% of respondents on the question of educator visibility agreed that educators in academically effective schools are actively and visibly involved.

**Discussion**

The results presented here show that the majority of respondents were women (54%). The majority of respondents are also seen to be matured since their ages range from 30 years to 40 years and above (82%). One other prominent feature is that most are seen to be educated since they have a

diploma or degree and higher (98%). Looking at their teaching experience one can be impressed since 90% of respondents have ten years or more experience. Based on these results, one can then say the respondents have knowledge on educational matters. The interviewees were asked, "What do you consider to be the most important factor that makes schools effective?" here interviewees indicated that strong leadership on the side of the principal and the School Management Team (SMT) are of utmost importance. They maintained that if the SMT do their utmost, when the Head of Department (HOD) control educators` work, there will be effectiveness in the school. They maintained that that the school becomes effective if there is the kind of leadership that has a mission and vision of seeing where the school has to be. The second argument endorsing the school leadership was stated that it is not only the principal who makes the school effective, but the aid from the SMT and School Governing Body (SGB) also impact on school effectiveness. Excerpts from the interviews illustrate this. For example Respondent 6 answered the question by stating: *"…it is a team effort…all the members have to share a common goal."* Respondent 18 supported Respondent 21 sentiments by stating that: *"…if the management of the school is united, the school will be able to run smoothly and be effective".* In supporting this views was Respondent 31 who said: *"…strong leadership on the side of the principal and his SMT….if members of the SMT does their utmost, if the HODs control educators` work there is going to be effectiveness".*

On the issue of educators in effective schools, the interviewees were asked: "Tell me about the staff in your school". Respondent 12 replied: *"…in most cases effective schools have most qualified educators".* This was supported by Respondent18 who indicated that: *"…educators in these schools were not furthering their studies but are encouraged to further their studies and they are taught new methods of teaching that makes it easier for leaners to achieve".* This response was supported by Respondent 13 when she indicated that: *"…in our school, most of the budget is channelled towards educator development…educators are encouraged to attend workshops, if no workshops are called by the circuit office, our school organises people that they know are good in that field".* On the issue of school resources, when answering the question "What is your opinion on school resources for school effectiveness?" the general response was that resources influence the school effectiveness. Respondent 8 stated that: *"… financial resources are the most important resource for the school to be seen as effective".* One thought provoking statement came from a principal of a secondary school when talking about a school`s good results. He stated that: *"… for learners to expect good results at the end of the year while schools have no resources is an uncalled-for thing…all forms of resources are equally important for the schools to be effective".* Another principal from a deep rural school indicated that: *"…in these schools, there are limited resources but educators and learners are adapted to this scarcity…they are used to improvising hence lack of resources is not seen as a big problem to hinder school effectiveness…if there are no educators, the finances can be utilised to add staff and the finances can also be utilised to purchase teaching aids that makes learning easy for learners, hence school academic effectiveness".* The general feeling from the respondents is that if there are adequate resources, schools in their region could be seen to be far more than what one expects from an effective school. Respondents also said what they believe was very important for schools to be effective. They talked about working conditions. Respondent 15 indicated that: *"… the working conditions are conducive to teaching, learners are well disciplined and as a result most of the time is taken by teaching rather than disciplining learners".* This study has proven that for the school to be considered as effective there has to be an involvement of all stakeholders and they all should share a common vision.

## Recommendations

This study has shown that there is a link between school effectiveness and availability of resources. We therefore recommend that the department of education should provide schools with resources. The principal of the school also has a responsibility to raise funds for the school so that resources can be bought for the school. The department of education should encourage educators to improve

their qualification. Certificate courses can be organised by the department of education to help all under qualified educators. The principal has to see to it that conditions in the school are conducive for education. Principals should encourage educators to know and understand the mission and vision of the school and to work towards the attainment of the school vision. Principals should at all times engage the school management team in school affairs since they are the ones who look into day to day running of the school. The management of the school should see to it that there is security in the school. Safety measures should be seen as a priority since it puts learners at ease and as a result learners are able to learn

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# ATTITUDES OF PARENTS TOWARDS CHILDREN WITH LEARNING DISABILITY IN KAURA-NAMODA DISTRICT, ZAMFARA STATE NIGERIA: IMPLICATIONS FOR COUNSELLING

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## Abstract

This study investigated the attitudes of parents towards children with learning disabilities in Kaura- Namoda District, Zamfara State, Nigeria. The population of the study comprised all parents of children with learning disabilities. The study employed purposive sampling in selecting seventy five parents of the learning disabled children. The instrument used for the study was semi structured which contains 32 items tagged as "Attitudes of Parents towards Children with Learning Disability (APCLD)".The instrument was vetted by experts from Usmanu Danfodiyo University Sokoto, Nigeria to ascertain its validity. A reliability co-efficient of 0.87 was obtained after test re -test method was used with an interval of four weeks. The instrument was statistically ascertained to be reliable, valid and consistent for the study. The study employed two sampled t-test procedures and One-way analysis of variance. The result showed that parents have positive attitudes towards their children with learning disabilities. However, male parents tended to have shown more positive attitudes towards learning disabilities than female parents. The study also revealed that positive attitudes towards children with learning disabilities were high urban areas than in rural areas of the district. Finally, the study recommended that the local government area should give support and encouragement to the parents on their positive attitudes towards learning disabilities. More so, group and individual counselling for the female parents and other parents in the rural areas are highly recommended to be offered by the professional counsellor
**Keywords**: Attitude, Parent, Children, Learning Disability and Counselling.

## Introduction

Learning disability has for long time been an issue of concern to parents, teachers, policy makers and educators. In Nigeria, children with learning disabilities are not identified early enough. Such children suffer from stigmatization, social rejection and discrimination. Facilities for children with learning disabilities in Nigeria are very limited (Ozoh, 2010).

Individual differences among learners are important aspects in teaching and learning that needs to be greatly recognized by every teacher. The need to consider individual differences is not accounted with the fact that children do not grow and develop the same way. For example, while some may be tall and thin in their growth others may be short and fat. These are some differences in children's physical growth. There are also some differences in their development such as intelligence, emotional maturity and social development. Thus, there are hearing impaired children, the learning disabled, the gifted, the talented, the mentally retarded and host of others. This is why parents and teachers according to Musa (2010) expect children to perform in their academics. So often when students fail in school they complain that the students are not concentrating and working hard enough or they lack the ability to or motivation to learn; whereas the problem is beyond the issue of concentration, motivation, hard work or lack of ability. The students may be having some kind of learning difficulties and learning disability or disorders. Children with learning disability cannot try harder, pay close attention; or improve motivation on their own; they need help to learn how to do these things because of their special needs. However, learning disability is not a problem of intelligence but that of special needs. There is therefore need for teachers to understand the

characteristics of different learning disabilities in order to provide intervention for learners with such kind of disabilities.

The term learning disability is a very general one, and without much precision to refer to the general problems in learning experienced by some 10-16% of the school population(National Health and Medical Research Council,2009).Children who have in the past, been referred to as 'Slow learners', 'Low achievers' and or 'Hard to teach' certainly fall within the category of learning difficulties (Kolawale,2010).However, The National Joint Committee on Learning Disability (NJLCLD) as cited in Akinade and Suleiman (2010) defined learning disability as a general term that refers to a heterogeneous group of disorder manifested by significant difficulties in the acquisition and use of listening, speaking reading, writing, reasoning or mathematical ability. This implies that learning disability addresses specific kind of learning problems which cause a child to have troubles in learning and using certain skills despite hi/her intellectual functioning. Some of the skills mostly affected are; reading, writing, listening, speaking, reasoning and doing mathematics. Children with learning disabilities usually have average or above average intelligence but their brains process information differently from the norm or average. This is in congruence with what Awopetu (2010) posited that a child with a learning disability cannot try harder, pay closer attention, or improve motivation on his/her own; he needs help to learn how to do things. A learning disability is therefore not a problem with intelligence, but learning disorders are caused by a difference in the brain that affects how information is received, processed or communicated. Children with learning disabilities have trouble processing sensory information because they see, hear and understand things differently.

We are constantly affected by the world around us, and this reflects our attitudes and approach even towards persons with disability. According to Stephanie and Bernardet (2011) the survival of persons with disability, is still today threatened by attitudes, prejudices and beliefs and are common among non-disabled people. Disability in its wider perspective as reported by Cesar (2012) that there are between 500 and 600 million people worldwide living with a disability. According to statistics, from World Health Organization (WHO) as cited is the Cesar (2012) approximately 10% of children and youth in the world (about 200 million) have learning disabilities. 80% live in developing countries, although the numbers vary widely across the countries. Latin America and the Caribbean have approximately 50 million people with disabilities, 90% unemployed and 82% living in poverty.

According to a United Nations release on the population of persons with disabilities worldwide, Nigeria has a population of over 22 million people with all forms of disabilities. This group of people over the years has faced several difficulties in trying to be heard on socio-economic and political development of the nation. During the last few years, there has been a growing awareness and major shifts in attitudes towards learning disability. Although the social inclusion of persons with disability has improved over the last few years, there are still a number of social barriers. These vary from inaccessible physical environments, negative stereotypes to prejudiced attitudes, to mention just a few and are faced by persons with disability in different spheres of life. It is undisputable fact that persons with disabilities are amongst the most marginalized sector of the society in Nigeria. Inherent to this marginalization is the very nature and structures of socio-economic relationships that relegates them in our society (Disability Development Institute DDI, 2013). In this connection, Oyewa (1999) remarked that the growth of the human society depends almost entirely on the contribution of its members. The disabled persons without doubt, are members of the Nigeria society that can contribute to its development if they are encouraged properly. Also if truly the youths of today are the leaders of tomorrow, then today students with disabilities who are part of today's youth should be well taken care of, for them to become leaders of tomorrow in their respective chosen professions. Almost all disabled children can be trained to live productive lives and provide this contribution to national development.

The process of providing education to students with special needs is considered one of the most prominent challenges the human communities encounter. The international community for instance, unanimously agrees that more than 10% of school age children in every community suffer from at least one disability. Furthermore, the World Health Organization involved in special education estimated that disability reaches 15% in the developing countries (Al-khateeb & Hadidi, 2010).

The term special education started worldwide as a result of the negative attitudes that prevailed against the communities during the 50s and the 60s of the past century, calling for separating learners with special needs from their regular peers and assigning them to special classes. An empirical study was conducted to assess the effectiveness of separating the learners with special needs from their peers. For example, the study by Somaily, Alzoubi & AbdulRahman (2012) showed that the level of learning in the special classes is generally lower than that in the regular classes, and in most cases the learners are given specialized programmes delivered by teachers who are less efficient than those in the regular classes. The studies criticized the idea of assigning the learners with learning disabilities in special classes for fear of stigmatization.

**Conceptual and theoretical framework on Parental Attitudes towards Persons with Learning Disabilities**

Attitude, according to Stone (2001) is a state of readiness, a tendency to respond in a certain manner when confronted with certain stimuli. While attitudinal approach towards learning disabled people have been predominantly negatives and such behaviours appears to vary according to not only factors such as culture but also impairment. Family attitude contributes to the prognosis. Family with limited financial resources, lack of appropriate services and insufficient support systems are examples of family system risk factors that can contribute to poor prognosis.

The concept of disability has many varied definitions. For example, the general public perceives persons with learning disability as different from the norm. They are facing the stigma of needing help and piety. Meanwhile, society needs to understand that persons with learning disability have the right to speak and a space to voice their concerns and we have the obligations of lending an ear to listen to them and comprehend what they say. Also persons with learning disability are still facing lack of access to opportunities and experiences. As a result, they are still blocked from participating and contributing to society (Stephanie & Benarde, 2011). According to Merriam Webster (2013) Learning disability is any of various conditions(as dyslexia) that interfere with an individual's ability to learn and so result in impaired functioning in language, reasoning, or academic skills and that are thought to be caused by difficulties in processing and integrating information. In another term, Weta (2014) describes learning disability as a neurological disorder which result from a difference in the way a person's brain is wired. Children with learning disability are as smart or smatter than their peers. But they may have difficulty in reading, writing, spelling reasoning, recalling and or organizing information if left to figure things out by themselves or if taught by conventional ways. In another related definition by Sengen's Medical Dictionary (2012) Learning disability is an abnormal condition often affecting children of normal or above average intelligence, characterized by difficulty in learning such fundamental procedures as reading, writing and numerical calculations. The condition may result from psychological organic causes and is usually related to slow development of perceptual motor skills.

Learning disability is therefore of different types, the commonest learning disabilities that mostly affect children according to Weta (2014) are as follows and it is based on some of these types that the study was conducted:

Dyslexia: It is a language-based disability in which a person has trouble understanding written words. It may also be referred to as reading disability or reading disorder.
Dyscalculia: Is a mathematical disability in which a person has a difficult time solving
Arithmetic problems and grasping math concept.
Dysgraphia : A writing disability in which a person finds it hard to form letters or write  within a defined space

Auditory and visual processing disorder: Sensory disabilities in which a person has difficulties understanding language despite normal hearing and vision   Nonverbal Learning Disabilities: This is a neurological disorder which originates in the  right hemisphere of the brain, causing problems with usual- spatial, intuitive,  Organizational, evaluative and holistic processing functions.

Learning disability is a universal problem that occurs in all languages, races, cultures and nations in the world. The problem is not peculiar to Nigeria alone. The disabled person does not often know when he enters a social situation whether he will be an object of curiosity, piety, or sympathized with, helped, patronized, exhibited, praised for his abilities, avoided or actively rejected. Mishra (2004) observed that non-disabled treat persons with disabilities as different. They are not included in the competitive cliques that form among active adolescents. In a sense, they are treated as outcasts whom people may like but exclude from their inner circle for sports and leisure activities. They live with their disabilities in the community but they are never fully accepted by their peers.

Environmental risk factors such as lack of services and negative attitudes can also have an adverse influence on the prognosis of the child with disability (Seifer, Sameroff, Baldwin & Baldwin, 1992). Malum (2000) remarked that parents of the disabled children experience chronic stress and therefore need counselling services in order not to have wasted effort in rehabilitating the disabled children. Similarly, Kolawole (2008) pointed out that parents of the disabled children have many problems in managing their offspring. This bad attitude is resulted from ignorance to financial stress. This implies that the parents of these disabled children need support, encouragement and guidance right from the time the parents agreed to be husband and wife if they are to effectively play their vital roles of caring for the disabled children. Parents can as well help children with learning disabilities to achieve success by encouraging their strengths, knowing their weaknesses, understanding the educational system, working with professionals and learning about strategies for dealing with specific learning disability.

Existing studies showed that very often the parents have negative attitudes towards their children with disabilities .For example, Chandramuki, Shastry & Vranda (2012) found that family attitudes contribute to prognosis in children. The limited financial resources, lack of appropriate services, and insufficient support systems are the family systems risk factors that can contribute to poor prognosis.

Dayson (2006) conducted an empirical study aimed at investigating examining and the attitudes of the siblings and the parent towards children with learning disabilities. The study revealed that existence of one child with learning disabilities in a family causes enormous stress on the part of the parents and affects the lifestyle of the family and the interaction between siblings. In a similar study, Weiner (1999) investigated the attitudes of the parent with learning disabilities towards special education schools. The result showed that there are social and cultural effects on the attitudes of the parents towards the learning disabilities and their satisfaction about those schools. In addition, Somaily, Alzoubi & AbdelRahman (2012) investigated the opinion of parents on learning disabilities of their children from rural and urban areas. The results showed that the parents of children with learning disabilities in the rural areas expressed a high level of satisfaction compared with the

parents from the urban areas. This could be simply the fact that people in the rural areas are more sympathetic and accommodative.

In addition, Khrais (2004) conducted a study on the effects of training programmes in modifying parental attitudes towards their learning disabled children. The results revealed that the programmes are effective in modifying parental attitudes towards their learning disabled children.

In India, disability is viewed in terms of a tragedy with a better dead than disabled approach. Cultural beliefs about disability play an important role in determining the way in which the family perceives learning disability and the kind of measure it takes for its prevention treatment and rehabilitation. As Sen (1988) conducted a study in India and reported in his studies that parental expectations from their disabled child were mostly negative and unrealistic. Similarly, Dalal and Pande (1999) investigated cultural belief and attitudes of a rural Indian community towards physical disability. The result indicated fatalistic attitudes and external dependence in families with disabled children. Other studies such as Mccormack (1992), Demyer 1979 and Chandorkar (2000) discovered in their empirical studies that negative attitudes shown to disabled children adversely affects the parents. Family members of children with disabilities are often perceived to experience harmful psychological effects. Parents are found with unstable emotionality, constant grief, psychological ill health and unsatisfactory social isolation. The studies found these to be at higher risk for marital discord and social isolation. It was also found in same studies that the parents of children with disabilities perceive more problems in themselves and their family.

In a related development Kolawole (2008) conducted a study in Nigeria on parental attitudes towards their disabled children in Jos city. The study employed descriptive design with a sample population of 40 parents. The study also used stratified random sampling and chi-square for statistical analysis. The result of the study showed that the negative attitude of parents towards their disabled children is no longer a taboo but true life situation. This is simply because the study found that there was a common parental rejection high rate parental rejection, denial, overprotection, death wishes, fear, guilt, shock or trauma, anxiety and confusion.

**Statement of the problem**

A learning disabled person like every other person is a social being and is therefore no different from other able bodied persons. It is an irony however that he/she is not accepted by some societies and for it invariably focuses its attention on his disabilities rather than on his abilities, victims of diseases, accident or negligence, has been further victimized by their peculiar and irrational prejudice of the society. The parents may reject the disabled child because of resentment and guilt. As a result, the child may resent the parents. But being dependent upon the parents, the child is forced to suppress his blames which produces self hostility, guilt and anxiety. On the other hand, some parent whether from genuine sympathy or guilt reactions, may tend to over protect the child with equally harmful results. In either instance, the child's ego and social status needs are frustrated.

Disabilities in children often affect their educational possibilities. Ninety percent of children with various disabilities according to Cesar (2012) do not attend school. This limits their chances of better education and future development. The situation posed a number of challenges about how to better cope with disabilities in children.

Learning disabilities as witnessed in Kaura Namoda District have disastrous effects on the children's social and school lives; they also influence the families such as difficulties in academics, social and

emotional sides of their lives. Self esteem of the children with learning disability is low, their anxiety is high and they are less acceptable by their peers.

In every part of the world, married couples do expect and look forward to having a healthy baby with a very sound mind into their family. However, when the reverse is the case, a family is seen as an event that has considerable emotional, social and economic influence on the parents

Children living with learning disabilities in Kaura-Namoda District represent a serious challenge for parents and communities. Parents of children with disabilities experience chronic stress and stigma. The parents of children with disabilities thus, develop chronic sorrow characterized by periodic recurrence of sadness, guilt, shock and pain. They are plagued as Rangaswamy (1989) described by feeling of pessimism, hostility and shame. Denial, projection of blame, guilt, grief, withdrawal, rejection and acceptance are some of the usual parental reactions towards disabled children in Kaura Namoda district. Some parents also experience helplessness, feeling inadequacy, anger, shock and guilt, whereas others go through periods of disbelieve depression and self-blame.

Parents of the learning disabled children in Kaura Namoda District, Zamfara state do not like to admit the situation of their disabled children as true. Parents hold believes that such children with disabilities should not have been brought up into their family. It is to the extent that most of the parents feel the worst form of rejection to the disabled children is "Death wish".

Some parents of the disabled children associate the blame of their misfortune towards other people especially their enemies that they have hand in the affairs of their children in form of making 'juju' (spiritual acts) against their children. It is against this background that the current study explores parental attitudes towards children with learning disabilities in Kaura Namoda district with the following research questions and objectives.

To guide the study, the following research questions were formulated.
1. Is there any difference in the attitudes of male and female parents towards children with learning disability in Kaura-Namoda district?
2. Is there any difference in the attitudes of parents living in the rural and Urban areas towards their children with learning disability in Kaura Namoda district ?
3. Is there any difference in the attitudes of parents with high socio-economic status and low socio-economic status towards children with learning disabilities in Kaura Namoda district?
4. Is there any difference among parental ethnic group in their attitudes towards children with learning disability in Kaura Namoda district?

**The objectives of the study are to:**
1. determine whether there is any difference in the attitudes of male and female parents towards children with learning disability.
2. identify whether there is any difference in the attitudes of parents living in the rural and urban areas on children with learning disability .
3. find out whether there is difference in the attitudes of parents with high socio-economic status and low socio-economic status towards children with learning disability.
4. find out the difference among parental ethnic group in their attitudes towards children with learning disability.
Based on research questions the null hypotheses were formulated for the study.
1. There is no significant difference in the attitudes of male and female parents towards children with learning disability in Kaura Namoda district.

2. There is no significant difference in the attitude of parents living in rural and urban areas towards children with learning disability in Kaura Namoda district.
3. There is no significant difference in the attitude of parents with high socio-economic status and low socio-economic status towards children with learning disability in Kaura Namoda district.
4. There is no significant difference among parental ethnic group in their attitudes towards children with learning disability in Kaura Namoda district.

## Methodology
### Research Design
The study adopted descriptive survey research design. This design was adopted because of its ability to survey the attitudes of parents towards children with learning disability. The main instrument used for the data collection is a 32 semi structured item tagged as "Attitudes of Parents towards Children with Learning Disability, (APCLD)".The instrument was administered to a sample total of 75 parents of children with learning disabilities using the purposive sampling procedure in Kaura Namoda District of Zamfara State. To establish the content validity, the instrument was given to experts in measurement and evaluation, psychology, guidance and counseling in the department of educational foundation, Usmanu Danfodiyo University, Sokoto for vetting. After detail scrutiny, the instrument was affirmed to have covered the intended content and was therefore valid for use. The reliability of the instrument used for this research study was established when the researcher pilot tested the instrument with some parents from Kurya/Kasuwar Daji District who were not part of the sample use for the main study. A test-retest method was used with an interval of four weeks between the administrations. Pearson product moment correlation co-efficient was used in computing the correlation coefficient of the instrument. A reliability co-efficient of 0.87 was obtained. Hence, the instrument was statistically adjudged to be reliable and considered suitable for research use. Among the 32 items in the questionnaire, 8 were concerned with the parents' socio-demographic characteristics. These included sex, ethnic group, religion, marital status and age. Others were highest educational qualification, family level of income and location of residence. These were analyzed in frequencies and percentages. The attitude of the parents towards the children with learning disabilities was assessed with remaining 24 items structured along the modified four point Likert. Apart from establishing the significance of their attitude which was conducted with the one sample t-test procedure based on the four point scale, a test of difference between parents' gender, location of residence, socio-economic level were tested with the two sample t-test procedure. Differences between ethnic groups' attitude towards children with learning disabilities was tested with the one way analysis of variance. Test of significance was conducted at the 0.05 level of significance as provided in Oyejola and Adebayo (2004) which is in line with standard procedures. Ethical issues addressed in the study include seeking consent of the respondents and strict confidentiality of any information provided by them ensuring them that the information will be used for research purposes.

## Demographic data
With respect to the selected demographic variables, 45 or 60.0% of the parents were males while 30 or 40.0% were females. The selection is more associated with accessibility to parents than proportionate in approach. The religious classifications of the respondents showed that 49 or 65.3% were of the Islamic faith, while 25 or 33.3% were of the Christian faith. Only 1 or 1.3 of them belongs to the traditional religion. Though 4 or 5.3% each were divorced and single respectively but 67 or 89.3% of the parents were married at the time of the survey. The parents could be classified as relatively young as most of them were in the lower age groups of below 30years (13 or 17.3%), 31-40years 17 or 22.7%, 41-50years 24 or 32.0% and 51- to 60years 12 or 16.0%. Others not within this age bracket were just 9 or 12% of the total respondent. On the average, the parents have between 5 and 8children each while the average for the children with learning disabilities were between 1 and

3 per parents selected for the study. Of the total number of parents involved in the study, 42 or 56.0% were from urban location while 33 or 44.0% were from the rural areas. By socio-economic classification, 44 or 58.7% were in the high socio-economic group while 31 or 41.3% were in the low socio-economic group. This distribution reflects the actual practices in the society where most low socio-economic income group do not send their disabled children to school basically because of the cost. Most (41 or 54.7%) were of the Hausa/Fulani ethnic group, 10 or 13.3% were of Yoruba extraction while 12 or 16.0% each were from Igbo and other minority ethnic groups.

**Test of hypotheses**
The test of positivity of parents' attitude towards the children with learning disabilities was conducted by computing the rating on perception of the child, the expected chronic stress experience by the parents in the care of the child, problems of managing the children, the social isolation suffered by the child, and other psychological associated impact listed in the 24 items on which the parents rated their attitudinal perceptions. To establish the significance of the attitude the mean response were computed and compared with the midpoint for agreement which was fixed at the 2.5 on the four point scale.

**Hypothesis 1: There is no significant difference in the attitude of male and female parents towards children with learning disability in Kaura Namoda District.**

Attitudinal differences between male and female parents in their practices towards the children with learning disabilities was tested with the two sample t-test on the computed aggregate mean as summarized in Table 1.

**Table 1: Two sample t-test on attitude towards children with learning disabilities by participants' gender in Kaura Namoda.**

| Sex | N | Mean | Std. Dev. | Std. Error | DF | t-value | P | Remarks |
|---|---|---|---|---|---|---|---|---|
| Male | 45 | 3.16 | 0.347 | 0.052 | 73 | 2.209 | 0.030 | Significant |
| Female | 30 | 2.94 | 0.486 | 0.089 | | | | |

The result revealed that the male parents tended to have a more positive attitude towards their children with learning disabilities than the female parents. The variability in the mean score between the groups is statistically significant (P < 0.05). Therefore the null hypothesis is rejected. However, this difference was basically on the degree of rating since all the mean scores in the table were higher than the fixed level of 2.50 which means that the male and female parents have positive attitude towards their children with learning disabilities.

**Hypothesis ii: There is no significant difference in the attitude of parents living in rural and urban areas towards children with learning disability in Kaura Namoda District**

The effect of location of parents' residence (urban and rural) on their attitude towards their children with learning disabilities was tested by subjecting the aggregate mean attitudinal score to a two sample t-test procedure as summarized in Table 2 below:

**Table 2: Two sample t-test on attitude of parents towards their children with learning disabilities by location of residence**

| Location | N | Mean | Std. Deviation | Std. Error | DF | t-value | P | Remarks |
|---|---|---|---|---|---|---|---|---|
| Urban | 45 | 3.16 | 0.422 | 0.063 | 73 | 2.364 | 0.021 | Significant |
| Rural | 30 | 2.93 | 0.382 | 0.070 | | | | |

From the result obtained, the parents in urban location of the district have a higher positive attitude towards their children with learning disabilities than their counterparts in the rural areas of the district. The difference between the two groups is statistically significant (P < 0.05). The null hypothesis in this case is rejected. But the mean scores of the two groups indicated in the table clearly shows that the observed significant difference is more associated with the degree of rating on the four point scale than a divergence of opinion. This result contradicts the report of Somaily, Alzoubi & AbdelRahman (2012) from an investigation of parents' opinion on learning disabilities of their children from rural and urban areas. The report revealed that parents of children with learning disabilities in the rural areas expressed a high level of satisfaction when compared with the parents from the urban areas. In this study the reverse is the case.

**Hypothesis iii: There is no significant difference in the attitude of parents with high socio-economic status and low socio-economic status towards children with learning disability in Kaura Namoda District**.

Another variable whose effect on the parents' attitude towards the children with learning disabilities was investigated in the study was the socio-economic level of the parents. For this purpose, the socio-economic statuses were categorized into two levels of high and low income groups. The summary of the two sample t-test used to establish difference in their attitude is summarized in Table 3.

**Table 3: Two sample t-test on attitude of parents towards their children with learning disabilities by socio-economic level**

| Socio-economic level | N | Mean | Std. Dev. | Std. Error | DF | t-value | P | Remarks |
|---|---|---|---|---|---|---|---|---|
| High | 44 | 3.14 | 0.431 | 0.065 | 73 | 1.713 | 0.091 | Not significant |
| Low | 31 | 2.97 | 0.387 | 0.069 | | | | |

The mean attitudinal score (3.14) of parents with high socio-economic status is not significantly different from the score (2.97) of parents with low socio-economic status indicated in the table (P > 0.05). This would imply that there is no evidence to reject the related null hypothesis. Both groups however have positive attitude towards their children with learning disabilities as indicated by the mean scores.

**Hypothesis iv: There is no significant difference among parental ethnic group in their attitudes towards children with learning disability in Kaura Namoda District.**

Possible significant difference in the attitude of the parents towards their children with learning disabilities in relation to the parental ethnic grouping was conducted with the one way analysis of variance. The test did not reveal significant differences in attitude towards the children with learning disabilities between parents from the different ethnic background who were involved in the study. The observed F-value in the test was 0.290 with a probability level of significance of 0.832 (P > 0.05). The null hypothesis is therefore retained. Table 4 shows the mean scores, standard deviation and standard errors of the parent from the different ethnic groups involved in the study.

**Table 4: Mean attitudinal scores of parents on children with disabilities by their ethnic background**

| Ethnic grouping | N | Mean | Std. Deviation | Std. Error |
|---|---|---|---|---|
| Hausa/Fulani | 41 | 3.06 | 0.447 | 0.070 |
| Yoruba | 10 | 3.03 | 0.416 | 0.132 |

| | | | | |
|---|---|---|---|---|
| Igbo | 12 | 3.17 | 0.402 | 0.116 |
| Others | 12 | 3.03 | 0.369 | 0.107 |
| Total | 75 | 3.07 | 0.419 | 0.048 |

The mean scores in the table showed that all the parents irrespective of their ethnic background have positive attitude towards their children with learning disabilities. The ratings by the different ethnic groups as indicated in the table are approximately at the same level. This accounted for the non-significance of the variability between the mean score. The finding here contradicts Kolawole (2008) study in Nigeria on parental attitudes towards their learning disabled children in Jos city. The report revealed that parents in that study have negative attitude towards their children with learning disabilities and pointed out that the negative attitude of parents towards their disabled children is no longer a taboo but true life situation.

**Result and discussion of findings**

The study involved male and female parents from Kaura Namoda District of Kaura Namoda Local Government. The religious affiliation of the respondents include; Islam, Christianity and traditionalists. Three major ethnic groups such as Hausa/Fulani, Yoruba and Igbo participated in the study. The study also involved both urban and rural areas of the district. Socio-economic status of the respondents was also a variable that was looked into in the study. A total of four hypotheses were tested. From the test of hypothesis one, the findings showed that male and female parents demonstrated positive attitudes towards their children with learning disability. This finding contradicts Kolawale (2008) and Malum (2000) who asserted that parents of the learning disabled children have much problem in managing them.

The result of hypothesis two indicated that parents in the urban location of the district have high positive attitudes towards children with learning disability than their counterparts in the rural areas of the district. The result however contravened the report of Somaily, Alzoubi & AbdelRahman (2012) in their finding that parents of children with learning disabilities in the rural areas expressed a high level of satisfaction when compared with the parents from the urban areas.

Hypothesis three indicated that both parents with high and low socio-economic status showed positive attitudes towards children with learning disabilities. This means that parents have warm reception to their children with learning disabilities. This finding contradicts Kolawole (2008) who conducted a study in Nigeria and found that negative attitudes of parents towards their children with learning disability is no longer a taboo but true life situation. This simply means that there was a common parental rejection, death wishes, fear, trauma, anxiety and confusion.

In hypothesis four, the result showed that ethnic background of parents does not stand as a factor among parents for showing negative attitudes towards children with learning disability but rather positive response towards learning disabled children. This finding is not in conformity with Dalal and Pande (1999) who discovered fatalistic attitude among ethnic and cultural beliefs of rural India community.

**Conclusion**
Based on the findings from the analysis of the data and tests of the hypotheses carried out in the study, the researcher wishes to conclude as follows. Parents in Kaura Namoda District of Zamfara State have positive attitude towards their children with learning disabilities. Male parents have higher positive attitude towards their children with learning disabilities than female parents in the district. Positive attitude towards children with learning disabilities is higher in urban than in rural

areas of the district. Parents in the district did not differ in their attitude towards children with learning disabilities by socio-economic statuses and their ethnic background.

## Implications for Counselling

The study has shown that positive attitudes rather than negative dominated the minds of parents for children with learning disabilities in the district. The study proves that a learning disabled person is just like any other person and therefore makes no difference from the normal or able bodied person. Fatherly and motherly cares at home are the bases for love and support for the disabled child. This parental attitude shown in the district could most probably be transferred to the larger society to cover the entire Kaura- Namoda local government.

The study also implies that female parents need more counselling as regard to learning disabled children. This becomes necessary because of their less positive attitudes towards their learning disabled children when compared with their male counterpart. They need proper enlightment and counselling through rational emotive therapy. This may assist them to reason well, understand their situation and have more warm reception and acceptance of their children despite their deficiencies or disabilities. In addition, newly married couples need further encouragement and counselling as regard to any abnormality they find in their children.

Furthermore, the study implies that parents in the urban areas in the district are more receptive positively towards children with learning disabilities than in the rural areas. This could be associated with the level of their education and enlightment. The rural parents therefore need more of guidance and counselling for reshaping their perception towards children with learning disabilities. This could be done through some behavior modification techniques such as behavioural therapy, group therapy and self-management behavioural technique.

## Recommendations

The researcher wishes to make the following recommendations based on the finding from the study: There is need for counseling the female parents in the district as regard to their children with learning disabilities for their less positive attitudes towards learning disabilities. The use of rational emotive therapy could be employed to make them reasonable and logical in their thinking towards children with disabilities and give them warm support, acceptance and unconditioned positive regards.

Parents in the rural areas need group and individual counseling for reshaping their thinking towards children with learning disabilities. Counselling through behavior modification techniques such as systematic desensitization technique, self-management behavior change technique, positive practice, overcorrection technique and group therapy can be used in behavior modification for parents in the rural areas.

Parents of both high and low socio-economic status need to be supported and re-enforced on their good and warm reception for their children with learning disability.
Ethnic group in the district need to be well pressed and commended by the community and government for their positive attitudes towards children with learning disability.

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# PERCEPTION OF EDUCATORS ON PROVISIONING OF INFRASTRUCTURE IN RURAL AND URBAN SCHOOLS: A COMPARATIVE STUDY

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## Abstract

The paper compares the perceived views of rural and urban schools' educators regarding the infrastructure in their work environment. One-on-one interviews were used to collect data. The interviews were conducted with two women and five men purposefully selected from the study site. The results shows that educators identified a number of issues that they felt play a role in the learning and teaching environment. In most cases, rural educators painted a bleak picture regarding poor infrastructure compared to their counterparts in urban areas. The results suggest that there is much to be done to improve infrastructure provisions in rural schools, if they are to be on the same level with urban schools.

**Keywords**: rural schools, urban schools, infrastructure, resources, educators

## Introduction

> Education is the doorway to the wider world and an exposition on rural infrastructure is incomplete without an assessment of the extent to which we have been able to open this door for the children … (Ward, 2007).

Despite the fact that South Africa has made a tremendous change in improving the lives of people since the new dispensation in 1994, education is still confronted with major problems in many rural schools compared to urban schools. School infrastructure provisioning and well-maintained infrastructure systems are an imperative for improved schooling results. In essence school infrastructure which refers to "basic physical facilities that underpin a school" (Lunenburg & Ornstein 1991), will mean school provisions in this study.The problems related to infrastructural development were inherited from the apartheid era. This means that those who were in rural areas, including schooling, were even more neglected by that system. In fact it has been pointed out that most problems experienced in historically disadvantaged schools in South Africa are traceable to the apartheid system (Singh &Manser, 2002). The denial of opportunities arose because of racial segregation accompanied by unequal distribution of resources in favour of whites (ibid). In fact, researchers (e.g., Kallaway, 1984) have acknowledged that during the apartheid era, schooling and related issues did contribute to whites unfairly advancing economically to the detriment of other races in South Africa. In fact, school facilities in rural areas are said to have been the subject of debate, and frequently a sensitive political issue for more than a decade (Safra&Yelland, 1993).

Infrastructure is an integral component of the teaching and learning context. This is because a school's infrastructure enables students and teachers to access a wide range of tools, services and resources to support teaching and learning. For instance information technology through the use of computers could be useful for teaching, leaning and administrative purposes. The lack of resources is a critical factor in education because research has shown that it may negatively affect learning. It has been reported on the one hand, that lack of facilities and under-resourced schools are directly associated with the academic failure of learners (Lolwana, 2004). On the other hand, factors militating against rural learners' academic success have been identified as poor infrastructure, poverty, and lack of supportive academic discourse (Banda & Kirunda, 2005. In a similar view, it is pointed out that the realities of rural life related to poverty, lack of basic facilities and infrastructure

in schools also play a negative role in, for instance, attracting suitably qualified educators (Mabogoane & Pateli, 2006).On the other hand, the view is that when the classrooms are built, they should not be simple halls but must lead to favourable learning experiences. Such classrooms should provide an environment where learning is relevant, creative, and provide vibrant experiences for the learners (Davidoff & Lazarus, 2002).

Presently, there seems to be a gap between the former Model C schools and rural schools. Former Model C schools in some cases are referred to as dual medium schools. This means that the medium of instruction is in all instances Afrikaans and English. These schools ostensibly only admit learners who understand these two languages. Most educators in these schools usually are suitably qualified. This suggests that they possess the requisite qualifications. Possession of a requisite qualification means that an individual holding a mathematics degree may be a content specialist. This means that for that individual it becomes easier to explain complex mathematics problems to learners. Also, because of their education and training, suitably qualified educators may find it easier to create a positive and conducive teaching and learning atmosphere compared to their counterparts.

Most of the former Model C schools are usually flush with resources including good financial reserves. They generally will have fully equipped classrooms, laboratories and a library. Sometimes the schools have fully functional media centres with the latest computer software including the internet. This suggests that the learners may use the internet for exploration and researching activities. In fact, it is reported for instance that learners exposed to positive reading climates accompanied by the availability of computers benefits their science performance (Notten & Kraaykamp, 2009). In addition, the schools will have state-of-the-art sporting facilities. On top of this, parents with learners in these schools will contribute financially whenever requested to do so.

**Theoretical framework**
The theoretical framework adopted for this study is the theory of behaviourism. The behaviourism theory by Skinner in Johnson (2013) assumes that any behaviour that is positively reinforced, or rewarded, will repeat itself, especially overtime. This repetition over time will lead to the desired behaviour becoming a habit. In rural schools this has been negatively reinforced over time to the extent that it is an accepted fact that learners' performance in rural schools has been consistently affected negatively. On the other hand where the provisioning of infrastructure is good, this is positively reinforced and over time becomes a habit and the learners' performance is remarkably improved.

**The problem**
As has been indicated here, lack of infrastructure and facilities has a bad effect on learning and teaching especially in rural areas of South Africa. The purpose of this research study therefore was to explore educators' perceptions regarding infrastructure provisioning on learners' performance. In doing this, a comparison was made between UMzinyathi's rural schools and urban schools. The focus on the latter was on former Model C schools. So,thepaper reports on a comparison of the perceived impact of provisioning of infrastructure on learners' performance. Ultimately, the goal was to present contrasts and recommend solutions that will possibly address what prevails in rural schools. In this regard the objectives of this study were therefore to:
(a)    Compare rural and urban schools in terms of the resources they have
(b)    Understand the impact caused by lack of resources in rural schools
(c)    Describe and recommend what facilities are urgently needed by the schools at UMzinyathi rural schools

**Study site**

This study was conducted in both the rural and urban areas of UMzinyathiwhere the first author works. Rural schools in this part of the district may be classified as extremely poor because of lack of resources. In 2007 a national newspaper lamenting the Grade 12 pass rate in KwaZulu-Natal rural schools, indicated "... little is being done to change this situation resulting in Grade 12 results deteriorating every year ..." (Sunday Times, 2007). On the other hand, urban schools do not seem to be affected by the lack of resources identified here.

**Method**

The main research question of this study is: *What are rural and urban educators' perceptions regarding the impact of poor infrastructure in their schools?* To answer this question, five sub-questions were used in a one-on-one interview with the participants.

**Participants and procedure**

At UMzinyathithere are approximately 20 schools from the rural setting and 9 from urban areas. The participants from the rural schools were five principals while there were two from the urban schools. The principals were purposefully selected because they were to give first-hand information about their schools. Also, they were selected because they are accountable within the school system. Data were collected by means of open ended interviews. The aim of the interviews was to give an independent voice to the participants. In particular each participant was encouraged to provide as honest a view as they felt was applicable to them. In collecting the data, the participants were visited in their schools. In doing this, the researchers were mindful of the argument that a researcher has to go to the setting of the study because if participants are removed from their setting, it may lead to contrived findings that are out of context (Creswell 1998). Also, physical inspection of the facilities was carried out by the researcher.

**Results**

Here, an analysis of the collected data, its interpretation as well as the findings from the participants' perspective is provided. In particular, participants' perceptions regarding the provisioning of schools' infrastructure in their schools are outlined. Importantly, actual words used by the participants are quoted in this paper.

**Participants' Biographical Information**

**Table 1** Biographical data of the sample (N = 7)

| Category | N | % |
|---|---|---|
| Gender | | |
| Women | 2 | 28.6 |
| Men | 5 | 71.4 |
| Age | | |
| 20 – 29 | 3 | 42.9 |
| 30 + | 4 | 57.1 |
| Highest qualification | | |
| Grade 12 | 2 | 28.6 |
| Diploma (e.g. Diploma in Education) | 3 | 42.8 |
| Degree or higher (e.g. B.A. or B.A. Honours) | 2 | 28.6 |
| Teaching experience (Educators) | | |

| | | |
|---|---|---|
| 0 – 9 | 3 | 42.8 |
| 10 or more | 4 | 57.2 |

_____

**Participants' Views**

Here, pseudonyms are used for all the seven participants and these are: Ms Mbatha, Mr Khuzwayo, Mr Ngobese, Mr Ngubane, Mr Zungu, Ms Tom and Mr Koos. To the first question: *Which key resources need urgent attention at your school?* Rural participants identified: (a) school buildings (b) classrooms; and (c) computers. Regarding school buildings, the unavailability of offices and the state of the buildings were the most identified problems. This issue is illustrated by Mr Zungu, a rural principal, who said that he does not "... have administrative block". He indicated that he shares "... a classroom with administrative clerk". What this illustrates is the fact that there is no practical administrative working space for him. Similarly Mr Khuzwayo also a principal said that in his case the "... school buildings are made of mud and some are in a state of disrepair". He wondered about the maintenance of buildings and he asked "... who is going to collect mud and plaster these buildings?" In most schools we also observed that one or so windows were broken and a few door knobs were missing.

In contrast, participants from urban areas did not have any urgent schools building related concerns. For instance about buildings, painting the school and fixing dripping taps were identified as some of the things that needed urgent attention by participants. For example MsTom a principal from one urban school indicated, "... I want the school to be given a fresh lick of paint."Also, the participants identified classrooms as a matter that needed urgent attention. Conditions of classrooms and problems related therefore affect the provision of quality education in rural schools. For example, Zungu, indicated that in his school "… some classrooms are in a poor condition since the walls have huge cracks that you can clearly see outside from inside. Consequently during winter, the classrooms are very cold. Some windows are broken, and classrooms have no ceiling …"Contrary to the situation at rural schools, the adequacy of classrooms in urban schools not constitutes a problem according to participants' views. This was illustrated by an urban school's principal, Ms Tom who indicated that classrooms are not the key issue as they are well built and sufficient." According to her, the maintenance of electricity is regarded as a key issue in her school. Mr Koos expressing his concern on the similar issue explained that his main concern was on the state of electrified classrooms that need maintenance. In most schools we also observed that the conditions of classrooms were in a good state, although they may have been built years ago.

Participants also identified computers as a matter that needed urgent attention. For example, Mr Ngubane, indicated that "… we have never had computers of our own in this school …" When probed about what they do then, he said, "We would like our learners to use computers and especially the internet … due to poverty, learners are unable to travel to urban areas where they can access necessary information on the Internet." On the other hand, Mr Ngobese argued that the absence of computing facilities was a disadvantage for rural learners. About this issue, he argued that "… our learners are compromised because we do not have computers … This means that they don't have all the resources to complete assignments compared to children from schools that have these …" It was interesting to find out how computer literate the participants were. This was because not one of them mentioned their computer literacy status. When asked about this, all indicated that they could use computers. However, when the researcher scrutinised the educators' profile statistics this indicated that they could not work with computers. In fact, they indicated that they attended different workshops addressing a number of aspects relating to the improvement of qualifications, computer literacy, and curriculum development.

The situation was different with urban educators. In the urban schools computer facilities were also identified as needing urgent attention. However, in these areas the need was for more advanced equipment such as latest apps and software, laptops and iPods. What this indicates is the fact that urban educators were more competent in using technology. Also, this indicates that they were able to pass their knowledge to learners. This was confirmed by Ms Tom who said, "…I use computers confidently and creatively. On the same issue, she commented, "… computers enriches the learning environment and it is good for augmenting the teaching and learning process." On sharing the same sentiment, Mr Koos said, "… computers assist educators to develop skills and knowledge they need as lifelong learners to achieve personal goals and to be full participants in the global community." Further, he pointed out "… computer enables educators and learners to gain easy access to learning and teaching materials online without time constraints. It also assists educators to interact with their colleagues all over the world for mutual support and development." In a related manner Ms Tom said, "…I feel comfortable to work in conditions that are technologically favourable." In urban schools we observed that both educators and learners use computers in various ways. For example educators used a spreadsheet such as Excel for compiling marks. On the other hand, learners used *Google* to search information from the internet for assignments.

In the second interview question, participants were asked: *Apart from the facilities you mentioned earlier, which other facilities are lacking in your school?* Rural participants indicated that they had a problem with the lack of sanitation in their schools. Like classrooms, a shortage of toilets in rural schools was identified. Not only were there few toilets those that were there we not waterborne but pit latrines. This also means that there were no sinks for washing hands. For instance, Ms Mbatha, a principal, indicated "… there are only two pit toilets for learners in this school. … Can you imagine a school with more than 500 children and they only have two toilets?" Also, she pointed out "... For us, you have to walk a long distance to neighbouring homes to use a toilet … think about it, what happens all this time you are gone?" Mr Ngubane voiced his concern about the conditions of the toilets which need consistent maintenance. He said "... we cannot trust how healthy our school's environment is because there is no running water which makes it impossible to meet sanitary requirements." On the same view, Mr Zungu argued, "… every school must have elements that make the environment healthy. He also argued that "… sufficient numbers of toilets will decrease health concerns." Also, Mr Ngubane expressing a similar view as articulated by Mr Zungu said, "… I think if sanitary requirements are lacking the school will certainly be affected …" Asked in what way, he said "… what do you think will happen if there is a diarrhoea outbreak among learners for instance, … it will be a crisis … that's all."

Regarding urban schools things were completely different. Here, participants referred rather to the extension of school buildings. It should be mentioned though that increasing the number of toilets was mentioned by Mr Koos. For instance, he said "… my school needs to increase the number of classrooms to accommodate more learners ... This will allow us to admit more learners." When asked what about issues of sanitation and toilet facilities, he said "… no, no, no toilets are fine we have enough … maybe we can add some if the school is eventually extended."Disparities were observed in both the rural and urban schools with regards to toilet facilities. The toilets in the rural schools were indeed in a state of disrepair so the claims Ms Mbatha made could be confirmed. The views expressed by urban schools' participants about the presence of toilet facility were also easy to observe. In urban schools toilet facilities were functional and sinks were there for hand washing. In these schools a handyman was even employed to do general repairs.

The third question participants responded to was: *What would you say is the most important issue that affects student learning within classroom?* Rural school participants viewed classroom overcrowding as the main contributor to poor performance of learners in their schools. In this regard, participants indicated that classrooms were sometimes so full that it was not easy even to walk around to observed learners when doing their work. This situation means that slow learners or

those with learning difficulties may be deprived of the opportunity to be attended to individually. About this matter Mr Khuzwayo said, "… overcrowding results in neglect of all learners especially slow learners." Some educators felt that this was also not hygienic because if any learner had flu or any contagious infection then others were likely to be affected which impacts on learning. Regarding hygiene, Ms Mbatha said "… one day about half of the learners in the school were absent … I found out that all were coughing and they went to the clinic … I think this was because of the overcrowding since one learner was coughing the previous day." The participants also indicated that writing tests and examinations was a problem in overcrowded classrooms. Mr Zungu in fact pointed out that "When children write tests they must seat in free space with their question papers, pens, rulers, everything … in our classrooms this is not possible … That is why you find some learners copy from others." Classroom overcrowding was easy to observe in the participating rural schools. In fact, in some schools we saw learners even sharing a chair. Also, in some instances four learners would be seating in a desk that ideally should accommodate two. On average the researcher observed that some classrooms had more than 80 learners.

Contrary to the situation in rural schools, the overcrowding of classes in our own view did not pose a serious problem in urban schools. We observed for example, that most urban schools had manageable numbers of learners per educator. In one of the Grade 9 classrooms the ratio was one educator to thirty learners (1:30). In fact, we were told that they wished that the numbers could decrease to the extent of reaching a ratio of 1:15. About decreasing the teacher - learner ratio Ms Tom happily stated, "… I do not have a problem of overcrowded classes, but I wish that the ratio norm goes down from what it is, to 15…" When asked why she wanted such a low ration, she gave a number of reasons including "… I will focus more on learner control; … there will be individual teaching and attention to learners' needs; … Can you imagine if each class is occupied by 15 learners, this would improve the result of the school … also we could produce more learners with good university entrance qualification." Similarly, Mr Koos indicated, "… a positive culture of learning and teaching is affected by the number of learners in a classroom … The numbers we have in Grade 12 presently would not allow us to achieve 100% … We would love to have less numbers in Grade 12."

The fourth question participants responded to was: *In what way does infrastructure provisioning affect the retention of qualified educators?* Therural participants viewed teacher qualification as a contributing factor in learning and teaching. Qualifications pose a problem in rural schools where some educators are under-qualified to teach. MsMbatha for instancerevealed that she has two unqualified educators who have only attained Grade 12." She said "... what can they really teach? ... after all they are not trained to ... She added that "…the problem of unqualified educators makes the execution of duties by SMT to be burdensome." On the other hand, Mr Ngubane confessed that he has to guide, mentor, orientate and support the unqualified educators in doing their core duties. The problem of teacher qualification in urban schools is slightly different. In urban schools teacher qualification was identified as a problem from the participating schools. However, in these schools some educators are not professionally qualified but they are academically qualified. For example, Mr Koos said "... I have qualified educators with specific skills of teaching. The educators' skills are measured through learners' performance. But in our school we still have educators who hold good degreesbut without a teaching qualification. I encourage them to register for certification." Document analysis indicated that some educators indeed did not have a teaching qualification. However, urban educators had the minimum requirement for employment.

Finally, the participants were asked: A this point *what springs to your mind that you feel we could have asked you? Or you would like to mention?*Rural school participants identified the availability of textbooks as something that affects effective teaching. Included in this was the lack of library facilities within the schools. Expressing his frustration, MrZungu said: "… money allocated for books

and stationery is insufficient … It does not cover individual learners' needs …" According to him, he would prefer that all grade levels had sufficient textbooks especially for learners in Grade 12. About this he said "…I have to order new books every year … Can you believe this? … Every year my learners have to share the textbooks because I am never given the number I ordered …" About libraries all the principals indicated that it was not possible for them to have these in their schools. When asked why it was not possible to have libraries, the common theme was 'space'. For instance Mr Khuzwayo said: "… I don't have a library in my school ... It is unfortunate that our learners write the same paper with learners who are exposed to all learner support materials ... My school is not adequately equipped for learners to perform as envisaged." Here, he clarified that he was referring to Grade 12 examination results that most schools tend to be judged by in South Africa.Perhaps MsMbathaencapsulated everything when she said "… we do not have enough classrooms in good order … don't you think a library would be a luxury? … We just put the few books we have in shelves at the back of the staff room …" The unavailability of textbooks was easy to observe in most participating rural schools. In fact, in some schools we saw pairs of learners sharing a book. Also, in some instances learners would be seating attentively listening to the educator with no textbooks in front of them.

In contrast, urban participants did not have problems related to the shortage of textbooks. It should be emphasised that educators and parents play a critical role in monitoring the textbooks. This was confirmed by MsTom who said "… I check my books every school term … I closely monitor the books… In each term I notify parents if ever the books are lost … Parents also assist me to monitor the textbooks." When probed in what way, she said "… I usually receive phone calls from parents reporting missing textbooks." On the same issue MrKoos pointed out that "… working with literate community makes it easy to ensure that textbooks are returned." When asked about the role of parents, he said "… When a book is lost, it is the responsibility of a parent to purchase that book … There is absolutely no argument about it." In most schools we also observed a pile of boxes with textbooks. When asked how they manage to buy so many books, we were told that they do not rely on departmental books but they also get money raised through donations and school fees and also from parents who purchase books for their children. Not only did the urban schools possess a number of books they also had dedicated libraries. I was told in each school that there was a teacher librarian who ran the facility. The only concern raised was about more library space. For example, Mr Koos indicated "… the problem with the library here is insufficient space ... We are from time to time forced to pack older books in boxes in order to display new ones ... the library can also only accommodate few learners ... we rotate them ... for example every grade level has its library day … ehh like … Grade 8s have library periods on Mondays and so on …" Also, the participants highlighted problems related to the unavailability of laboratories in their schools. They identified the unavailability of laboratories to have a major influence on effective teaching and learning. Expressing his disappointment with regards to laboratories, Mr Ngobese pointed out "… there is no laboratory in my school ... We should have at least one laboratory ... It should be fully equipped with instruments and chemicals ... Absolutely, there is no room for conducting experiments .... As a result, we stick to the old method of teaching ... Instead of being hands-on when doing practicals ... we and learners rely on the information from the textbook." Expressing his concern and sharing similar views, Mr Zungu said "… lessons of science in my school are traditional." When asked why they are traditional, he gave a number of reasons "... The actual teaching is teacher-centred ... There is no way to show learners anything or prove scientific problems … the method of teaching is just using the textbook." According to him the unavailability of a laboratory limits him, "… from ever showing my learners some of the experiments recommended in the textbook I use."

When enquiring about the storage areas for science equipment and chemicals, observations confirmed that all the rural schools had no laboratories as indicated by the principals. In one school we observed a box in a corner of a Grade 12 science stream classroom labelled 'science equipment.' When we opened the box we found that it contained a number of beakers and test tubes that

looked new. In the box there were also a few vials of chemicals such a potassium sulphate and calcium carbonate but the markings on them indicated that these were 5 years old although they appeared new.Contrary to the situation in rural schools, the issue relating to the existence or non-existence of laboratories did not constitute a problem in urban schools. Here the complaint was about the cost of equipment and chemicals for the laboratories. About this MsTom said "... children when doing experiments sometimes break the equipment for instance test tubes … this brings an additional burden because we have to constantly replace all broken sets … we also have to constantly pay suppliers for replenishing used chemicals in the laboratory ... We need to be supplied with new chemicals every three months ..." Grade 11 learners were observed performing experiments involving titrations where they had to observe and describe colour changes using different indicators. Spillages of chemicals and breakages of burettes and a few beakers were also observed.

## Discussion

The discussion presented here focuses on the rural schools because the problems that were identified were really about them than for urban schools. In fact, participants from urban schools did not report any comparable major problems. Rural participants firstly, identified school buildings, classrooms and what happens within, and information and communication technology (ICT) as critical. Here the participants talked about the absence of offices, fully equipped classrooms, non-availability of ICT resource as well as suitably qualified educators. Indeed it was also observed that some schools were not in good physical condition. In fact, the issues raised by the rural participants are critical because school buildings are identified to play a role in learners' performance and wellbeing. About this, it is argued that "… the interrelationship between school buildings and the level of students' scholarly performances has been the topic of studies … for a number of years" (Knapp, Noschis, &Pasalar, 2007, p. 5). If for instance school buildings are not in good shape then they may pose a danger to both learners and educators that may affect the teaching and learning process. This is important because it is argued that the physical environment a school maintains is an important aspect in promoting good health, safety and effective teaching and learning (Jones, Brener, & McManus, 2003). For example in situations where there are no widows, in winter this may result in learners and educators feeling cold and falling ill with ailments like flu and pneumonia.Regarding the importance of ICT it is pointed out that "… the role of educational technology should be to replace classroom discourse patterns with those having more immediate and natural extensions to knowledge-building communities …" (Scardamalia&Bereiter, 1994, p. 265). In this study's context ICT was non-existent in rural schools which means the previous contention is impossible to achieve.

The implications of the issues raised here from the rural perspective mean that there is an urgent needto address the participants' concerns. For instance the need for good buildings may be seen from Mr Khuzwayo's argument that mud structures are a problem with no one to fix them. Furthermore there is a need to build schools that meet the space needs of all in the school. This is an issue that was illustrated by Mr Zungu who felt that he had no adequate working space.Studies have also reported on the impact of the school resources on learner achievement. For instance, Uline and Tschannen-Moran (2008) indicate, "… results confirmed the hypothesis that school climate plays a mediating role in the relationship between facility quality and student achievement." Considering that the rural schools in this study did not have quality facilities then it should be expected that this would impact negatively on learners' performance. In this study the rural schools participants referred to the high rate of unqualified and under-qualified educators. Educators who are not suitably qualified are not ideal in the teaching and learning context because they leave learners with gaps in knowledge. In this regard it is argued that professionally qualified, conscientious and dedicated educators are essential if the goals and objectives of education are to be achieved

(Articles, 2013). There are many reasons why rural schools especially experience the lack of qualified educators. Amenities in rural schools may be a problem in terms of recruitment. Also, the very profession is not highly regarded by society which makes it difficult for suitably qualified educators to sacrifice everything and go and work in rural areas. About this issue it is further argued that "… the problem of under-qualified teachers, like related problems with working conditions, recruitment, and retention in teaching, can be traced to a common root: the low stature and social standing of the teaching occupation" (Ingersoll, 2005).About this matter it is argued that "... academic and professional qualifications of educators explain their roles of being scholars and subject matter specialist" (Robinson 2010, p. 194).One major problem with unqualified or under-qualified educators is that they find themselves teaching subjects they don't have competence in. This may impact negatively in learners' understanding of and performance in such subjects. This is a concern that has been identified in other countries too. For instance in Britain it is reported that "An average of more than 20 pupils are currently taught in each secondary school classroom, meaning hundreds of thousands of children are likely to be in lessons led by 'under-qualified' staff everyday" (Paton, 2012). Similarly in the US, Ingersoll (1999, p. 26) points out that:

> …a third of all secondary school teachers of mathematics have neither a major nor a minor in mathematics … analyses have also shown that out-of field teaching greatly varies across schools, teachers, and classrooms. The crucial question, however … is why so many teachers are teaching subjects for which they have little background.

Perhaps the findings of this study may be summarised through Amedzo's (2007, p. 2) contention that:

> … whilst some of the urban schools are relatively well resourced and well staffed, the same cannot be said of many of rural school in South Africa. The latter are confronted with overcrowded classes, lack of classrooms, lack of textbooks, inadequate furniture and other basic resources.

**Conclusions and recommendations**

In this paper it is indicated that participants' perceptions of the poor provisioning of infrastructure underpins learners' performance. What theparticipants seem to suggest is that good infrastructure will assist learners to perform better. In a sense this appears to be reasonable because the urban schools that participated in this study showed this. Also, studies have focused on the good virtues of good infrastructure at school. For example, it is pointed out that good buildings are essential in improving student academic achievement (Fisher, 2001).It is very important to understand that the presence of adequate resources in the school influences the quality of learners' learning in education (Koen &Ebrahim, 2013). The nature of infrastructure in some rural schools pose a challenge, therefore it is recommended that the development of solid learning infrastructure should be a priority to enhance the teaching and learning process. This should be done to ensure that high-quality education is sustained in rural schools.

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# DETERMINANTS OF MATERNAL HEALTH CARE SERVICES UTILIZATION IN RURAL COMMUNITIES OF OSUN STATE, NIGERIA

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## Abstract

Maternal morbidities and mortalities in developing countries are often attributable to poor utilization of health care services and facilities. This study therefore determined the level of utilization of maternal health care services by women of reproductive age in selected rural communities of Osun State, Nigeria. Multi-stage sampling technique was used to select 125 respondents interviewed for the study. A well-structured and validated interview schedule was used to collect the primary data, which was subjected to both descriptive and inferential statistics. The result shows that majority (76.0%) of the respondents were within the ages of 20-30 years, while 23.2% of the respondents fell between 31-41 years of age. About 46.4% of the respondents were secondary school leavers, tertiary education (32.0%), and primary education (11.2%) and very few (4.8%) had no formal education. A wide range of information sources were available to the respondents but prominent among these were radio (69.6%) and Television (67.2%). The result revealed that all respondents considered observing and monitoring the health of the newborn and mothers has an important component of maternal health care services (MHCS). Substantial number (93.6%) showed a positive attitude for frequent antenatal visits during pregnancy while 92.8% showed that the use of trained health medical personnel during delivery was necessary. The response of the respondents to availability, accessibility and affordability of MHCS stood at (55.2%), (63.2%), (60.0%) respectively. The major constraint to the utilization of MHCS was long distance to Health Centers and financial incapacitation. The result from inferential statistics shows that there exist a significant relationship between respondents' knowledge (r=0.276; p≤0.05), availability (r=0.365; p≤0.05), accessibility (r=0.472; p≤0.05) and affordability (r=0.580; p≤0.05) with MHCS utilization. Regression analysis reveals that family size, knowledge, accessibility, availability were the major determinant of the utilization of MHCS however, affordability (β =0.40) contributed most among other determinants. Hence, it becomes crucial that adequate knowledge and accessible health care service made available at reasonable cost will enhance its utilization.

**Keywords**: Maternal health, Health care services, Utilization, Rural communities

## Background Information

The World Health Organization (WHO) estimated that over 500,000 women and girls die from complications in pregnancy and childbirth each year worldwide, with approximately 99% of these deaths occurring in developing countries. Moreover, it is estimated that globally, up to 20 million girls and women a year suffer from maternal morbidities – surviving childbirth, but enduring chronic ill health. The inadequacies in the access to health facilities have reduced the life expectancy of rural inhabitants and increased infant mortality (Ajala *et al*., 2005). This is because sound health is fundamental for leading a socially and economically productive life. But low quality or inadequate facilities of maternal services are some of the problems facing the health sectors in Nigeria. There are three main health providers in Nigeria, these are: government or public health service provider, private health care provider and non-governmental health care providers which are coordinated by the ministry of health. Utilization of maternal health care services covers its accessibility, availability, affordability and cost involved. Accessibility of health services has been shown to be an important

determinant of utilization of health services in developing countries (Mekonnen and Mekonnen, 2002).

According to the report by African Progress Panel on maternal health (September 2010), one woman dies per minute in child birth around the globe, while half of these deaths occur in the sub-Saharan Africa. Despite the progress made in many countries in increasing the availability of maternal health care, the majority of women across Africa remain without full access to these services. Recent maternal mortality ratio (MMR) estimate shows that millions of women in developing countries experience life and other serious health problem related to pregnancy or child birth. Complication of pregnancy and child birth cause more death and disability than any other reproductive health problem (UNFPA, 2005). Nigeria is a leading contributor to the maternal death figures in sub-Saharan Africa not only because of her high population density but also because of her high maternal mortality ratio (Babalola and Fatusi, 2009).

Despite the progress made by successive government at increasing maternal health care services and facilities in terms of availability, the majority of women across Africa remain without full access to these care facilities even when cost is not a primary obstacle; women are often unable to access quality maternal healthcare when they needed it. Healthy mothers lead to healthy families, societies, economies and strong health systems. In Nigeria the use of health facilities during delivery by pregnant mothers is still very low and maternal morbidity and mortality remains a public health problem (Khalid, 2006).

Maternal health indicators in Nigeria are particularly bleak. About one in every nine maternal deaths worldwide is a Nigerian woman (FMOH, 2009). In 2009, 580,000 women were reportedly dying yearly as a result of maternal deaths and Nigeria is believed to be having 2 per cent of the world population but accounts for 10 per cent of these deaths, estimated at 50,000 women a year (Imosemi, 2009). According to Ideh (2009) 1 in 800 women die as a result of pregnancy–related complications in Nigeria. In Lagos State, Nigeria alone, there is an alarming under-five mortality rate of 85 per 100,000 live births, and maternal mortality rate of 650 in 100,000 live births. (Idris, 2009).With an estimated 59,000 maternal deaths, approximately two percent of world's population, Nigeria contributes almost ten percent of the world's maternal deaths; this signifies that the incidence of maternal mortality is on the increase (FMOH, 2005).

Men and women engage in different agricultural activities with different impacts on their health. Rural women tend to be involved in those aspects which involve strenuous physical labour that may have unpleasant effects for pregnant women. Also work in the farm often involves carrying loads that may be inappropriate for pregnant or under-age women, as well as adopting working postures that could be injurious to them/baby. For women who are already malnourished and suffering from iron deficiency (anaemia), their pregnancy state and child delivery could become extremely hazardous (Chukuezi, 2010). Nigerian women contribute immensely to food security of the nation, both at the production and processing stages. This gender role will be seriously undermined if their health status is not given adequate attention during and after child birth. Investing in maternal health will not only save life, but also will promote women as an important economic drivers for sustainable economic development in Africa (APP, 2010). It is against this backdrop that the study sought to determine the utilization of maternal health services in rural communities of Osun State, Nigeria.

## METHODOLOGY
### The Study Area
Osun State is bounded in the East and West respectively by Ondo and Oyo states, while Kwara and Ogun States share boundary with the state in the North and South respectively. The state is made

up of thirty local government areas and one area (LGAs) office. Agriculture is the traditional occupation of the people, other occupations include making of hand-woven textiles, tie and dye clothes, leather work, Calabash carving and mat-weaving.  The state has tropical vegetation that is made up of rain forest in the south and small area of guinea savannah towards the north. The climate coupled with fertile soil farmer's cultivation of wide range of food; cash crops and valuable tropical trees are part of the state natural endowment (Thomas et al., 2005). The population of the study constitutes the women of reproductive age in the rural communities of Osun State, Nigeria.

## Sampling Procedure and Sample Size

Multi-stage sampling technique was used to draw sample used for the study.  Osun State has 30 LGAs which was stratified into rural and urban LGAs. From the rural LGA strata, 2 LGAs were randomly selected namely Ayedaade and Egbedore.  Ayedaade and Egbedore LGAs have 26 and 7 Health Centers respectively.  Randomly, 2 health centers each (Oke-Elu, Ode-Omu, Ido-Osun, Olorunsogo) were chosen from the selected LGAs based on attendance at the antenatal and postnatal clinic.   Average attendance was 88, 62, 51 and 48 in Oke-Elu, Ode-Omu, Ido-Osun and Olorunsogo respectively. Fifty percent of the average attendance was then selected to give 125 respondents interviewed.

## Measurement of Variables

### Knowledge

The knowledge of maternal health services was measured by asking the respondents to give appropriate answer to 25 knowledge maternal health care services questions. Correct response was scored 1, while incorrect response was scored 0.  The highest score, lowest score as well as the mean scores were determined. Score above or equal to the mean score was considered to be high knowledge, while score below the mean score was taken for low knowledge.

### Availability

The respondents were asked to respond to a list of 20 maternal healthcare services whether or not available for use. Their responses were scored as follow: always = 2, rarely = 1, never = 0. Thereafter, the highest score, lowest and the mean score were computed. The mean score and above was categorized as high while the score below the mean was categorized as low availability.

### Accessibility

The respondents were asked to respond to 20 maternal healthcare services. Their responses were scored as follow: Very Accessible = 2, Accessible = 1, Not Accessible = 0.  The highest score, lowest score and the mean scores were computed. The mean scores obtained was used to determine the extent of accessibility of maternal health services and this was grouped as high or low.

### Affordability

Responses were elicited from respondents by asking if they can afford to pay the bills for the 20 maternal healthcare services items provided. Their responses were scored as follow: Very Affordable = 2, Affordable = 1, Not Affordable = 0. The highest score, lowest score and the mean scores were computed. The mean scores obtained was used to determine the extent of accessibility of maternal health services and this was grouped as high or low.

### Ethical Considerations

Permission to conduct the study was sought from the Director of Primary Health Care in each of the maternity centers in the study area. All respondents consented before participating in the study.

**RESULTS AND DISCUSSION**
**Socioeconomic Characteristics of the Respondents**
Table 1 reveals that the age distribution of the respondents ranged between 20 and 52 years. The result shows that majority (95.0%) of the respondents were within the ages of 20-30 years, while 29.0% of the respondents fell between 31-41 years of age. This explains that the majority of the respondents was in their child bearing age and thus makes them potential users of maternal health care services. This is consistent with Magadi et al (2007) who ascertain that younger women exhibit higher utilization of maternal care services than older ones. The reason for this is that the young mothers are at first birth order thus making their level of utilization high. On religious affiliation, substantial number (76.0%) was Christian and Islam (48.0%), while very few (1.0%) were traditionalist. Similarly, a higher level of utilization of the maternal health care services were recorded among respondents from Christian faith compared to the Muslims. Ghuman (2003), in a similar study stated that Islamic injunctions which encourage male domination constraints women's power and autonomy which could limit their ability to make important decisions and also restrict their movement.

The selectivity in the use of maternal health care services among certain age groups of mothers also existed among educational groups. About 58.0% of the respondents were secondary school leavers, tertiary education (40.0%), and primary education (14.0%) and very few (6.0%) had no formal education. The result follows the findings of Mekonnen and Mekonnen (2002) view that utilization of modern health care facilities increases with educational attainment. Family income is an important factor that influences maternal health care service. Table 1 results revealed that majority (63.2%) of the respondent had income above #10,000 while (32.0%) had income less than #10,000 per annum. This implies that the income level of the respondents was low, which can limit utilization of MHCS. This support the findings of Adamu (2011) submission that family income is an important enabling factor as it determines the amount of funds available to an individual to cover healthcare and related costs, e.g. physician consultation, drugs, transportation costs, and so on. Majority of the respondents (64.0%) have family size ranging from 4 to 6 while (55.0%) of the respondent family size ranging from 1 to 3. Likewise, few of the respondents (4.0%) family size ranging from 7 to 9.

**Table 1: Frequency distribution of respondents based on their socio-economic characteristics**

| Variables | Frequency | Percentage |
|---|---|---|
| Age | | |
| 20-30 | 95 | 76.0 |
| 31-41 | 29 | 23.2 |
| 42-52 | 1 | 0.8 |
| | | |
| **Religion** | | |
| Christianity | 76 | 60.8 |
| Islam | 48 | 38.4 |
| Traditional Worshipper | 1 | 0.8 |
| | | |
| **Educational Status** | | |
| Non-Formal Education | 6 | 4.8 |
| Adult Literacy | 7 | 5.6 |
| Primary education | 14 | 11.2 |
| Secondary education | 58 | 46.4 |
| Tertiary education | 40 | 32.0 |
| | | |
| **Family income** | | |
| None | 7 | 5.6 |

| | | |
|---|---|---|
| Below #10,000 | 39 | 31.2 |
| #10,000- #20,000 | 40 | 32.0 |
| #21,000- #30,000 | 19` | 15.2 |
| Above #31,000 | 20 | 16.0 |
| **Family size** | | |
| 1-3 | 55 | 44.0 |
| 4-6 | 64 | 51.2 |
| 7-9 | 4 | 3.2 |
| Above 9 | 2 | 1.6 |

## Sources of information of the respondents

Table 2 shows that radio was the most available source of information accessible to the rural women (69.6%) for maternal health care services.  This implies that most of the respondents listen to health awareness programmes on radio. This supported the findings of Olajide and Thomas (2011) on the "*Ndu Kaaku"* radio soap opera programme which stated the impact of its broadcast to the general masses in the alleviation of suffering and poverty in Nigeria by improving reproductive, maternal and child health.  Television (67.2%) was another form of media that stands as source of information to the respondents. It implies that among the wide range of information sources available to the respondents, radio and television were the most prominent among them. In support of these findings, Babalola and Fatusi (2009) said using the media to disseminate consistent messages to promote the use of maternal health services could help to increase discussion of these issues within the community and it will be a relevant step towards changing prevailing negative norms.

**Table 2: Distribution Respondents by Sources of Information**

| Source of Information | Yes | | No | |
|---|---|---|---|---|
| | **Freq.** | **%** | **Freq.** | **%** |
| Friends | 69 | 55.2 | 56 | 44.8 |
| Radio | 87 | 69.6 | 38 | 30.4 |
| Television | 84 | 67.2 | 41 | 32.8 |
| Monthly Meeting | 36 | 28.8 | 89 | 71.2 |
| GSM | 59 | 47.2 | 66 | 52.8 |
| Husband/Relatives | 8 | 6.4 | 117 | 93.6 |

## Knowledge of the respondents on maternal health care services

Table 3 shows that majority of the respondents (59.2%) have high knowledge on maternal health care services in the study area. This corroborates the findings of Zhao *et al* (2009) that  health knowledge is considered to be one of the key factors that enable women to be aware of their right and health status in other to seek appropriate health services. Further study by Collinson and Cowley (1998) indicated that client knowledge was related to utilization of health services; especially for women of child bearing age where it enhanced effective utilization of the health care services in the study area.

The result also indicates that majority (100%) considered that observing and monitoring the health of the newborn and mothers is an important component of MHCS. This suggests that antenatal care is one of the components prioritized by the women of the reproductive age in the study area. About 96.8% of respondents revealed that maternal healthcare services help to reduce complications of delivery. Furthermore, 94.4% indicated that postnatal care services render observation of pulse and temperature of women after birth. This infers that majority of the women of reproductive age in the

study area have adequate knowledge of the postnatal care which is a component of maternal care service.

**Table 3: Respondents' Distribution Based On the Knowledge of Maternal Health Care Services**

| | Knowledge Test | Correct | | Incorrect | |
|---|---|---|---|---|---|
| | | Freq | % | Freq | % |
| 1 | Malaria treatment is an important maternal health care service component | 123 | 98.4 | 2 | 1.6 |
| 2 | Blood pressure checkup is a routine exercise in maternal health care service | 123 | 98.4 | 2 | 1.6 |
| 3 | Family planning exercise is not compulsory in maternal health care service | 37 | 29.6 | 88 | 70.4 |
| 4 | Maternal health care service provides an adequate education that elicit safe delivery for pregnant women | 123 | 98.4 | 2 | 1.6 |
| 5 | Maternal health care service do not emphasis much on exercise for stress reduction and anxiety in pregnant women | 63 | 50.4 | 62 | 49.6 |
| 6 | Maternal health care service provides information about healthy eating and Vitamin D supplement for pregnant women | 120 | 90.6 | 5 | 4.0 |
| 7 | Education on symptoms of domestic violence is one of the maternal health care services rendered during pregnancy | 118 | 94.4 | 7 | 5.6 |
| 8 | Antenatal care does not provides opportunity to know menstrual history to determine the expected day of delivery in maternal health care service | 60 | 48.0 | 65 | 52.0 |
| 9 | Maternal health care services enables the development of positive partnership between the mother and midwife | 114 | 91.2 | 11 | 8.8 |
| 10 | Maternal health care services are only necessary during the early stage of pregnancy alone | 38 | 30.4 | 87 | 69.6 |
| 11 | Maternal health care services is less concerned with early detection and timely treatment of pregnancy diseases | 59 | 47.2 | 66 | 52.8 |
| 12 | Counseling and educating pregnant women about their health and of their child is an important aspect incorporated in Maternal health care service | 115 | 92.0 | 10 | 8.0 |
| 13 | Postnatal care which is the examination of the mother after birth is not a component of Maternal health care service | 40 | 32.0 | 85 | 68.0 |
| 14 | Maternal health care service provides information about child spacing and techniques to avoid unwanted pregnant | 116 | 92.8 | 9 | 7.2 |
| 15 | Post natal care which includes hygiene and sanitation of the pregnant women is not one of the Maternal health care service | 56 | 44.8 | 69 | 55.2 |
| 16 | In Antenatal care, a component of Maternal health care service anti-tetanus injection is administered to pregnant women during pregnancy | 109 | 87.2 | 16 | 12.8 |
| 17 | Maternal health care services helps to reduce complications in pregnancy | 121 | 96.8 | 4 | 3.2 |
| 18 | Antenatal care makes it possible to screen for sexually transmitted diseases like HIV infection | 111 | 88.8 | 14 | 11.2 |
| 19 | Blood test during pregnancy is an important aspect of | 122 | 97.6 | 3 | 2.4 |

| | | | | | |
|---|---|---|---|---|---|
| | Maternal health care service | | | | |
| 20 | Observing and monitoring of health of newborn and mother is of importance in Maternal health care service | 125 | 100.0 | - | - |
| 21 | Maternal health care service does not offer support and guidance in parenting skills and breast feeding | 38 | 30.4 | 87 | 69.6 |
| 22 | Maternal health care service provides assessment of post-partum uterine involution of the mother during Postnatal period | 118 | 94.4 | 7 | 5.6 |
| 23 | Assessment of vaginal blood loss is not a part of Maternal health care service during Postnatal care | 52 | 41.6 | 73 | 58.4 |
| 24 | Postnatal care services renders observation of pulse and temperature for women after birth | 118 | 94.4 | 7 | 5.6 |
| 25 | Maternal health care services assist pregnant women to identify actual symptoms of disorder after child delivery | 116 | 92.8 | 9 | 7.2 |

**Table 3b: Categorization of Knowledge to Maternal Health Care Services**

| Category of knowledge | Score range | Frequency | Percentage | Mean | SD |
|---|---|---|---|---|---|
| High | 21-25 | 74 | 59.2 | 20.6 | 3.00 |
| Low | 12-20 | 51 | 40.8 | | |

**Availability of Maternal Health Care Services to Respondents**

Table 5 shows that more than half of the respondents said that there is availability of MHCS in the study area. This supports the study by Onah *et al* (2006) that health care utilization of population is related to the availability, quality and cost of services as well as to socioeconomic structure and personal characteristics of the user. A high proportion (91.2%) of the women interviewed stated that the BP checkup is always available within the study area. This helps to guide against any complications related to pregnancy, delivery and postnatal care in the women of child bearing age in the study area. Furthermore, over 55.6% of the respondents indicated that nutrition education is within their means in the study area. The availability of nutrition education as highlighted by the respondents is a part of health education in MHCS has also been stressed in previous studies (Akpala, 1998; Onwudiegwu, 1999).

**Table 5: Frequency distribution on the availability of Maternal Health Care Services**

| Maternal health Care Services | Always | | Rarely | | Never | |
|---|---|---|---|---|---|---|
| | Freq | % | Freq | % | Freq | % |
| BP check | 114 | 91.2 | 11 | 8.8 | | |
| PCV test | 85 | 68.0 | 33 | 26.4 | 7 | 5.6 |
| Palpation test | 101 | 80.8 | 20 | 16.0 | 4 | 3.2 |
| Urine test | 71 | 56.8 | 45 | 36.0 | 9 | 7.2 |
| Blood test | 74 | 59.2 | 42 | 33.6 | 9 | 7.2 |
| Iron supplement at the beginning of first attendance till date | 83 | 66.4 | 37 | 29.6 | 5 | 4.0 |
| Anti-malaria Treatment | 85 | 68.0 | 36 | 28.8 | 4 | 3.2 |
| Nutrition Education | 107 | 85.6 | 12 | 9.6 | 6 | 4.8 |
| Vitamin A supplement | 71 | 56.8 | 36 | 28.8 | 18 | 14.4 |
| Uterus Inversion | 65 | 52.0 | 41 | 32.8 | 19 | 15.2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Examination | | | | | | |
| Scanning (Ultrasound) | 47 | 37.6 | 53 | 42.4 | 47 | 37.6 |
| Health Counseling Education | 103 | 82.8 | 16 | 12.8 | 6 | 4.8 |
| Routine Checkup (Womb Examination, Position of the fetus) | 99 | 79.2 | 23 | 18.4 | 3 | 2.4 |
| Measurement of child weight | 93 | 74.4 | 29 | 23.2 | 2 | 1.6 |
| Family planning counseling | 92 | 73.6 | 29 | 23.2 | 4 | 3.2 |
| Vaccines for Pregnant Women | 95 | 76.0 | 26 | 20.8 | 4 | 3.2 |
| HIV status | 52 | 41.6 | 46 | 36.8 | 26 | 20.8 |
| Assessment of Postpartum Uterine Involution | 67 | 53.6 | 47 | 37.6 | 11 | 8.8 |
| Vital Signs and General health Nursing Mothers | 95 | 76.0 | 24 | 19.2 | 6 | 4.8 |

**Table 5b: Categorization of availability to Maternal Health Care Services**

| Category of availability | Score range | Frequency | Percentage | Mean | SD |
|---|---|---|---|---|---|
| Low | 2-30 | 56 | 44.8 | 30.8 | 6.8 |
| High | 31-76 | 69 | 55.2 | | |

**Accessibility of Maternal Health Care Services to Respondents**

Majority (63.2%) of the respondents stated that MHCS is highly accessible in the study area. This shows that distance and means of transportation is not a barrier to rural women in the study area. There is overwhelming evidence that distance to health facility is a strong determinant of the choice for maternal health services (Esimai, 2002). In support with this, Awoyemi *et al* (2011) in a study on effect of distance on utilization of health care services in Kogi State asserted that accessibility to health care facilities has been studied and discovered to be very crucial determinant in the location and utilization of the facilities, given its location.

Nutrition education by the women in the study area is found to be accessible (77.6%) and adequate information is found to be accessible to the women through counseling by the health worker in the study area. This corroborates the stand of Molesworth (2002) that mobility is a key factor for many rural communities to accessing available preventive and curative health services, and also supports indirect determinants of health including livelihoods and education. This implies that the accessibility of health services has a positive influence on people's decision in health care seeking behavior of the respondent in the study area.

**Table 6: Distribution of Respondent based on Accessibility to Maternal health care services**

| Maternal health Care Services | Very Accessible | | Accessible | | Not Accessible | |
|---|---|---|---|---|---|---|
| | Freq | % | Freq | % | Freq | % |
| BP check | 89 | 71.2 | 33 | 26.4 | 3 | 2.4 |
| PCV test | 72 | 57.6 | 43 | 34.4 | 10 | 8.0 |
| Palpation test | 87 | 69.6 | 31 | 24.8 | 7 | 5.6 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Urine test | 85 | 68.0 | 32 | 25.6 | 8 | 6.4 |
| Blood test | 80 | 64.0 | 38 | 30.4 | 7 | 5.6 |
| Iron supplement at the beginning of first attendance till date | 81 | 64.8 | 36 | 28.8 | 8 | 6.4 |
| Anti-malaria Treatment | 86 | 68.8 | 33 | 26.4 | 6 | 4.8 |
| Nutrition Education | 97 | 77.6 | 23 | 18.4 | 5 | 4.0 |
| Vitamin A supplement | 88 | 70.4 | 29 | 23.2 | 8 | 6.4 |
| Uterus Inversion Examination | 70 | 56.0 | 44 | 35.2 | 11 | 8.8 |
| Scanning (Ultrasound) | 62 | 49.6 | 48 | 38.4 | 15 | 12.0 |
| Health Counseling Education | 95 | 76.0 | 26 | 20.8 | 4 | 3.2 |
| Routine Checkup (Womb Examination, Position of the fetus) | 86 | 68.8 | 31 | 24.8 | 6 | 6.4 |
| Measurement of child weight | 86 | 68.8 | 35 | 28.0 | 4 | 3.2 |
| Family planning counseling | 87 | 69.6 | 35 | 28.0 | 3 | 2.4 |
| Vaccines for Pregnant Women | 82 | 65.6 | 38 | 30.4 | 5 | 4.0 |
| HIV status | 61 | 48.8 | 44 | 35.2 | 20 | 16.0 |
| Assessment of Postpartum Uterine Involution | 69 | 55.2 | 44 | 35.2 | 12 | 9.6 |
| Vital Signs and General health Nursing Mothers | 88 | 70.4 | 33 | 26.4 | 4 | 3.2 |

**Table 6b: Categorization of Accessibility to Maternal Health Care Services**

| Category of accessibility | Score range | Frequency | Percentage | Mean | SD |
|---|---|---|---|---|---|
| Low | 0-30.2 | 46 | 36.8 | 30.2 | 7.5 |
| High | 31-38 | 49 | 63.2 | | |

**Affordability of Maternal Health Care Services to Respondents**

Table 7 reveals that majority (66.0%) of the respondents considered MHCS was affordable in the study area. This shows that women of child bearing age were able to pay for health care services even to the least paid worker in the study area. This implies that provision of affordable health care in the study area will enhance utilization thereby reducing maternal and child mortality in the area. WHO, (2001) explains that access to appropriate; affordable and timely transport affects people's ability to receive preventative and emergency obstetric care that is essential for survival in the rural areas. Majority (72.8%) of the respondent illustrated that BP check was found to be very affordable in the study area. About (66.4%) of the respondent indicated that vitamin A supplement, health counseling education and routine check during pregnancy was very affordable in the study location respectively. This support the study of Chimankar and Sahoo (2011) that wealth index of the household has a positive effect on the odds of skilled attendance during delivery which is a component of MHCS. The reason is that women from households with higher economic status have power of affordability and have greater exposure to accessing relevant information and knowledge regarding issues related to maternal and child health.

**Table 7: Distribution of Respondents on Affordability of Maternal health care services**

| MHCS | Very Affordable | | Affordable | | Not Affordable | |
|---|---|---|---|---|---|---|
| | Freq | % | Freq | % | Freq | % |
| BP check | 91 | 72.8 | 32 | 25.6 | 2 | 1.6 |
| PCV test | 76 | 60.8 | 44 | 35.2 | 5 | 4.0 |

| | | | | | |
|---|---|---|---|---|---|
| Palpation test | 83 | 66.4 | 36 | 28.8 | 6 | 4.8 |
| Urine test | 74 | 59.2 | 47 | 37.6 | 4 | 3.2 |
| Blood test | 65 | 52.0 | 55 | 44.0 | 5 | 4.0 |
| Iron supplement at the beginning of first attendance till date | 8 0 | 64.0 | 39 | 31.2 | 6 | 4.8 |
| Anti-malaria Treatment | 81 | 64.8 | 42 | 33.6 | 2 | 1.6 |
| Nutrition Education | 87 | 69.6 | 36 | 28.8 | 2 | 1.6 |
| Vitamin A supplement | 83 | 66.4 | 37 | 29.6 | 5 | 4.0 |
| Uterus Inversion Examination | 67 | 53.6 | 49 | 39.2 | 9 | 7.2 |
| Scanning (Ultrasound) | 57 | 45.6 | 54 | 43.2 | 14 | 11.2 |
| Health Counseling Education | 83 | 66.4 | 38 | 30.4 | 4 | 3.2 |
| Routine Checkup (Womb Examination, Position of the fetus) | 83 | 66.4 | 38 | 30.4 | 4 | 3.2 |
| Measurement of child weight | 84 | 67.2 | 37 | 26.6 | 4 | 3.2 |
| Family planning counseling | 78 | 62.4 | 45 | 36.0 | 2 | 1.6 |
| Vaccines for Pregnant Women | 76 | 60.8 | 44 | 35.2 | 5 | 4.0 |
| HIV status | 75 | 60.0 | 42 | 33.6 | 8 | 6.4 |
| Assessment of Postpartum Uterine Involution | 65 | 52.0 | 53 | 42.4 | 7 | 5.6 |
| Vital Signs and General health Nursing Mothers | 77 | 61.6 | 44 | 35.2 | 4 | 3.2 |

**Table 7b: Categorization of affordability to Maternal Health Care Services**

| Category of affordability | Score range | Frequency | Percentage | Mean | SD |
|---|---|---|---|---|---|
| Low | 0-29.9 | 50 | 40.0 | 29.9 | 8.8 |
| High | 30-38 | 75 | 60.0 | | |

**Research Hypotheses Tested**

Table 8 shows that availability is a significant factor (r= 0.365, p ≤ 0.05) in the utilization of MHCS in the study area. It can be inferred that the availability of the services will determine the level of its usage in the study area. Studies in developing countries have shown that the use of health-care services is related to the availability, quality and cost of services, as well as to the social structure, health beliefs and personal characteristics of the users (Kulmala *et al*., 2000).

Furthermore, data shows that significant relationship that exists between accessibility of the MHCS and its utilization in the study area. This ascertain that closeness or proximity of the MHCS influence its usage by the respondents.  Buor (2003) and Ajala *et al*., (2005) asserted that rural people often waste a lot of time getting to the nearest available health care center of which they have to trek long distance on many occasion because they are often faced with the problem of reliable means of transportation. Table 8 equally revealed that affordability is a significant variable that determines the utilization of MHCS. This implies that the cost implication of the services rendered will determine the level of its usage by the respondents. The health care utilization of a population is related to the availability, quality and cost of services, as well as to social-economic structure, and personal characteristics of the users (Manzoor *et al*, 2009).

**Table 8:  Correlation Table for the Relationship between Availability, Accessibility and Affordability of Health Care Services and Maternal Health Care Service Utilization.**

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| Variable | N | Mean | Standard deviation | r-value | p-value | Decision |
|---|---|---|---|---|---|---|
| **Availability** | 125 | 30.7840 | 6.79015 | 0.365 | 0.000 | Significant |
| **Accessibility** | 125 | 30.2240 | 7.50143 | 0.472 | 0.000 | Significant |
| **Affordability** | 125 | 29.9360 | 8.08198 | 0.580 | 0.000 | Significant |
| **Utilization of MHCS** | | 30.3600 | 6.99816 | | | |

**Determinants of Maternal Health Care Services (MHCS) Utilization in the Study Area**

Results of regression analysis from Table 8 shows that knowledge (β =0.161, p≤0.05), affordability (β=0.400, p≤0.05), accessibility (β=0.196, p≤0.05) and family size (β=0.161, p≤0.05), contributed significantly to the utilization of MHCS in the study area. The implication is that knowledge, affordability, accessibility and family size were the major variables that determine the utilization of MHCS. Affordability has 40% standardized coefficient making it the highest predicting variable to the utilization of MHCS in the study area. Therefore, affordable MHCS will enhance its patronage thus reducing child mortality and morbidity. Also, it will also promote a good health condition of women of child bearing age, hence increasing agricultural productivity in the study area. Nigeria Demographic Health Survey (2008) stated that non-health sector activities, such as water and sanitation, road communication, agriculture and internal security also influence maternal outcome.

**Table 9: Results of regression analysis**

| Model | Unstandardized coefficients | | Standardized Coefficients | T | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | .774 | 3.942 | | .196 | .845 |
| Knowledge | .374 | .163 | .161 | 2.294 | .024[*] |
| Availability | .102 | .082 | .099 | 1.250 | .214[*] |
| Affordability | .346 | .070 | .400 | 4.955 | .000[*] |
| Accessibility | .183 | .080 | .196 | 2.295 | .024[*] |
| Family Size | .755 | .332 | .161 | 2.272 | .025[*] |

Dependent variable: Utilization
Predictors: (Constant), knowledge, availability, affordability, accessibility and family size
Significant at 5% level of significance
F =19.098
$R^2$ = 0.445
Multiple R = 0.442
Standard Error = 5.32

**Conclusion and Recommendations**

A number of factors affect utilization of maternal health care services. Knowledge, accessibility, affordability and availability were found to be predictors of maternal health care services utilization however, affordability of these services mostly determines it utilization. It is pertinent therefore for government and non-government organizations to provide affordable maternal health care services in the rural Nigeria. This among other things will enhance its patronage thus reducing child mortality and morbidity. It will also promote healthy condition among women of child bearing age, hence increasing agricultural productivity and food security in Nigeria.

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# INVESTIGATING TEACHER CODE SWITCHING CONSISTENCY AND PRECISION IN A MULTILINGUAL MATHEMATICS CLASSROOM

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## Abstract

This study investigated teacher code switching consistency and precision in a secondary school multilingual Mathematics classroom in South Africa. Data were obtained through observations and interviews from three Mathematics teachers purposively selected from three schools in the Eastern Cape Province. Data were analysed using the works of Gumperz (1982), Mercer (1995) and Dowling (1998). Results showed that code switching frequency was inconsistent across teachers. Code switching frequency by these teachers was consistent during questioning-TQ and explaining-TE when teaching. Teachers consistently operated most in the public domain and least in the esoteric domain. Some IsiXhosa teacher translations of mathematical terms were consistent and precise and some were not. This study concludes that best practices for code switching need to be established to promote code switching that is systematic and beneficial to the conceptual understanding of Mathematics in secondary schools.

**Key words:** Code Switching, Consistency, Precision, Multilingual

## 1.      Introduction

Code switching, defined as the use of more than one language in the same conversation or utterance (Adler, 2001; Choudhury & Bose, 2011), is now widely accepted and viewed as a legitimate resource for supporting teaching and learning in multilingual classes (Setati, 2008). Research on multilingualism in Mathematics classrooms and other classrooms has shown that code switching is actually a resource or a competence available to multilingual students and teachers (Adler, 2001; Howie, 2003; Moschkovich, 2007; Setati, 2005; Schafer, 2010) and as such, teachers need to take advantage of the presence of multilingualism in their classrooms and use it to the advancement of student learning.

Code switching practices are currently a feature of many South African classrooms where teachers and learners share a common home language, while the language of learning and teaching is English (Probyn, 2009). The use of pupils' first language by the teacher provides a communicative resource to facilitate learning when students lack proficiency in the Language of Learning and Teaching, LOLT (Then and Ting, 2011). However, questions that arise are: How consistent is the use of a teacher's code switching in the Mathematics classroom? How precise is the observed code-switched terminology in communicating mathematical concepts and ideas during teaching? What are the best practices for teacher code switching in a multilingual Mathematics classroom in South Africa?

## 2.      Literature Review

### 2.1      Code Switching in the Classroom

Research has shown that there are reasons why teachers code switch during teaching. Setati (2005) alludes that code switching could be motivated by cognitive and classroom management purposes, which could help to regain students' attention or reinforce lesson materials. Baker (1993) states that code switching has many functions, some of which are given as: to emphasize a point, because a word is not yet known in both languages, for ease and efficiency of expression, as repetition to clarify, to express group identity and status and be accepted by a group, to quote someone, to interject in a conversation, to exclude someone from an episode of conversation.

Then and Ting (2011) in their interviews with Malaysian Science teachers, found that teachers viewed code switching as helping their students to understand terminology and concepts as well as helping their own classroom instructions. Code switching is thus driven by teachers' quest to promote learner-centered education. Mousley & Zevenbergen (2006) acknowledge that effective teachers plan Mathematics learning experiences that enable students to build on their existing proficiencies, interests and experiences. In Mathematics learning, code switching in which the teacher is vigilant and substitutes a home language word, phrase or sentence for a mathematical concept, can be a useful strategy for helping pupils grasp underlying meaning. This study seeks to explore teacher code switching consistency and precision during the teaching of Mathematics in secondary schools.

## 2.2    Critiquing Code Switching

The language ability and language choice of a person addressing a multilingual child are recognized as the most significant variable to date determining the child's language choice (Moschkovich, 2005). The teacher's language choices have thus important implications on learners' choice of the language to use and how to use it in the Mathematics classroom. With code switching practices now enjoying official sanction and legitimacy in South Africa (Adler, 2001) and teachers becoming more comfortable with its use (Ncedo, Peires & Morar 2002), South African multilingual mathematics classrooms need to find rigorous, practical and consistent ways of incorporating this resource in the teaching and learning process. Mafela (2009) acknowledges that the conditions under which code switching occurs, and the manner in which it is employed, determine the extent of its usefulness.

The when and how to employ code switching, thus, has a strong bearing as to whether or not it will benefit intended recipients. If it is not employed judiciously, it can do more harm than good (Mafela, 2009), if for example, it is used to fill gaps in teachers' language competency, or if it's used by an unqualified teacher (Mati, 2004). The immediate question that arises is: when does a teacher become 'qualified' to code switch? Essien (2013), a teacher trainer points out that teachers are trained in English and it's assumed that these same teachers will recontextualise what they have learnt in English into a different linguistic context at the end of their qualification. School teacher training institutions need to be adequately resourced for this task. Essien (2010) noted that there are no structured courses that attend specifically to Mathematics pre-service teachers of students who are not yet proficient in the language of instruction. The implementation of multilingualism in the classroom is left entirely for the teacher to decide as to the how, when and where to draw the mathematical vocabulary in indigenous language. Khisty (1995) cautions that knowing the Mathematics register in one language is not an obvious indication of knowing it another language. Deliberate steps will need to be taken to orient teachers to knowing Mathematics register in another language that is to be used in the classroom

In our review, it has been noted that many researchers (Abad, 2010; Mafela, 2009; Probyn, 2009; Setati, 2005, 2008; Setati, Chitera and Essien, 2009) have consistently argued that multilingualism and the occurrence of code switching in multilingual classrooms is potentially a resource and an advantage for teaching and learning Mathematics. Also, these researchers have sought to refute the assumption that code switching in multilingual classrooms is a problem and hindrance to the acquisition of Mathematics language and content. But for the realization of its effectiveness, code switching should be systematic, skillfully done and consistent (Then and Ting, 2011). However, little is known about whether teacher code switching is consistent, precise, systematic, structured and well planned in the Mathematics classrooms in South Africa. Lack of consistency and precision results in the haphazard use of code switching due to lack of recognized standards in terms of how and how much, and when code switching is to be used. Little is also known about how Mathematics teacher code switching consistency/ inconsistency across individual teachers, content and grades

impact on pupils' learning of Mathematical concepts. Our study intends to explore teacher code switching consistency and precision in the teaching of Mathematics.

## 2.3    Consistency and Precision

Mathematics employs **consistent** words and symbols to ensure precision of expression as loss of precision is always risky and might lead to difficulties of adjustments later. **Consistency** in this study would mean invariability in frequency of code switching into vernacular (IsiXhosa), uniformity of repeated use of terms, accuracy of translation into the vernacular and lack of ambiguities and contradictions in translated terms. **Precision** will mean the use of terms and symbols, consistent with mathematical definitions, in ways appropriate for students at particular grade levels (Ball et al, 2005).

## 3.    Theoretical Framework

This study is informed by aspects of Vygotsky (1978)'s socio-cultural theory particularly the critical role of language in communication and cognitive development. By embracing a socio-cultural perspective it is possible to view the language backgrounds of the teachers and pupils as a resource for teaching and learning Mathematics (Moschkovich, 2007). The socio-cultural aspects of Vygotsky's theory illuminate the point that learning and development cannot be dissociated from their context. The social environment influences cognition through its "tools", that is, cultural objects, language, and social institutions. According to Vygotsky (1978), people think and perceive things in a way made possible by the vocabulary and phraseology of their language. Concepts that cannot be encoded in their language will not be accessible to them, or at least will prove very difficult (Durkin, 1991). Learning then is seen as internalization which is the transformation of communicative language into inner speech and further into verbal thinking (Vygotsky, 1978).

Orton (2004) emphasizes that language used for thinking is almost certainly the first language. Thus mathematics communicated in one language might need to be translated into another to allow thinking and then translated back in order to converse with the teacher. Vygotsky thus, perceptively observed that language forms do not replace one another but coexist in the human mind (Oakley, 2004). Vygotsky's theory helps frame issues of learners' first languages as used by the teachers explored in this study, as they relate to code switching in the Mathematics multilingual classroom.

## 4.    Research Methodology
## 4.1    Research design

A case study design defined as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2003, 13) was used in this study. Interest was on in-depth and comprehensive examination of Mathematics teachers' language practices in the multilingual classroom. A case study approach was favoured in our study as it enabled us to gain a detailed view of the code switching practices teachers exhibit in Mathematics multilingual classrooms.

## 4.2    Sample and research process

Three grade 11 Mathematics teachers were purposefully selected from three secondary schools in the Eastern Cape Province. As explained by Denzin and Lincoln (2000), purposive sampling groups participants according to pre-selected criteria relevant to a particular research question. The following criteria were used to select the sample of teachers for this study:

- Mathematics teachers who are fluent in Xhosa.

- Mathematics teachers who are willing to participate in this study.

- Teachers with at least five years' experience of teaching Mathematics at secondary level and therefore are well experienced. This is to minimize the possibility that their language practices might be due to lack of teaching experience or recognized qualification.

- Teachers who teach at schools where code switching is prevalent.

Each teacher was observed for five consecutive lessons in a week teaching trigonometry. The lessons were video recorded. At the end of each lesson, each teacher was interviewed following up on the lesson that the teacher has just taught.

The videos were transcribed and analysed for:

4.1     consistency in the frequency of code switching into IsiXhosa across teachers, and,

4.2     lesson categories developed from the works of Gumperz (1982) and Mercer (1995).

The lesson categories for b) were:

- response to student contribution (RC),
- questioning (TQ),
- teacher explanation (TE),
- classroom assessment techniques (CA),
- evaluative remarks (ER), and
- class management talk (CM).

Further, the data was analysed for consistency and precision across mathematical domains of practice as propounded by Dowling (1998). These domains are:

- Esoteric domain, which is characterised by the use of highly specialized, formal and abstract mathematical language and content;

- Descriptive domain which uses specialized mathematical language imposed on non-mathematical content;

- Expressive domain which deploys non-mathematical language to refer to mathematical content;

- Public domain which is characterised by referring to forms of expressions and content expressed in entirely everyday terms.

### 4.3     Validity

Gay, Mills & Airasian (2006) define validity as the degree to which the data we collect accurately gauges what we are trying to measure. By using multiple sources of evidence during data collection, we increased the validity of the data in this study. Yin (2003, p99) argues that "case study design proposes using multiple sources of evidence in a triangulation fusion to contribute to addressing any potential problems." Methodological triangulation was ensured through the use of more than one method of data gathering that is lesson observation, document analysis and semi-structured interviews. In our study, data triangulation entailed the analysis of qualitative data received from semi-structured interviews and quantitative data from lesson observations and document analysis. The process of triangulation was intended to add value to the validity of this study as themes were established based on several sources of data.

### 5.     Data Analysis and Discussion

For the purposes of this paper, discussion will only focus on the following:

- General Teacher code switching Frequency
- Code switching frequency per lesson category
- Code switching across domains of mathematical practice
- Qualitative analysis of observations for code switching consistency

## 5.1    General Teacher Code switching Frequency

**Figure 5.1.1: Teacher A- Percentage Code Switching Frequency**

**Figure 5.1.2: Teacher B- Percentage Code Switching Frequency**

**Figure 5.1.3: Teacher C- Percentage Code Switching Frequency**
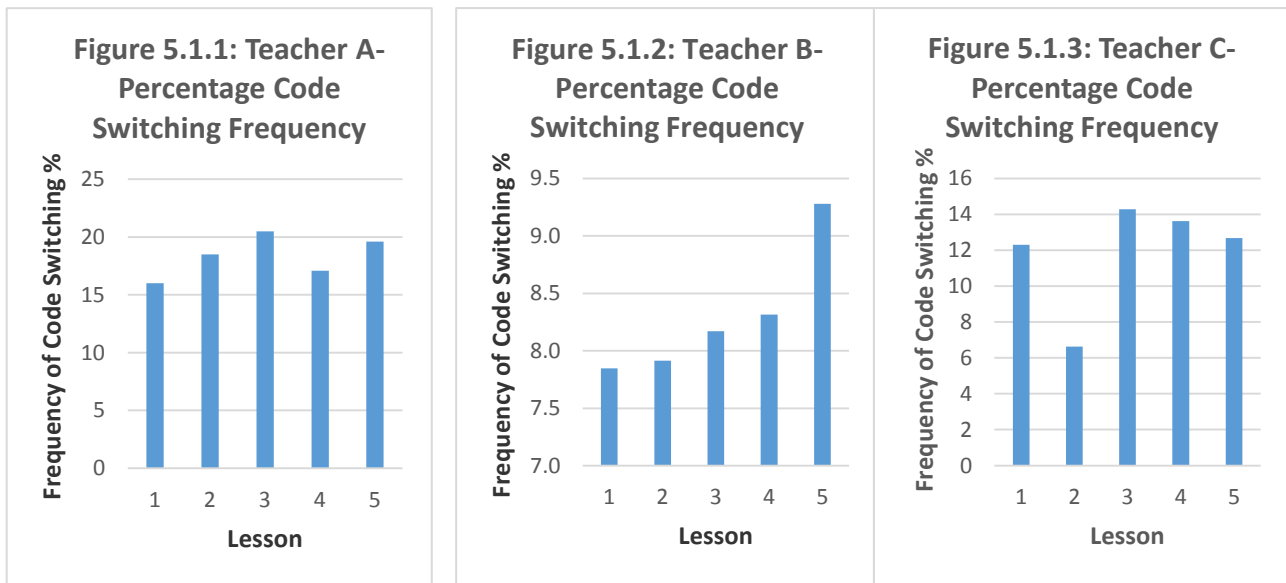
Figure 5.1.1 shows that teacher A fluctuated between 16% and 21% in the frequency of use of IsiXhosa during teaching. The teacher's frequency of code switching was not consistent across the five lessons.

Teacher B's code switching, indicated in figure 5.1.2, shows a gradual increase from lesson 1 to 5 in the use of IsiXhosa. There is a consistent increase in the frequency of code switching across the five lessons.

As is apparent in figure 5.1.3, teacher C exhibited an inconsistent frequency in his code switching into IsiXhosa. The frequency of code switching fluctuated between 6% and 13% during the teaching of the five lessons.

**Figure 5.1.4: Comparison of the Frequency of Teacher Code Switching**
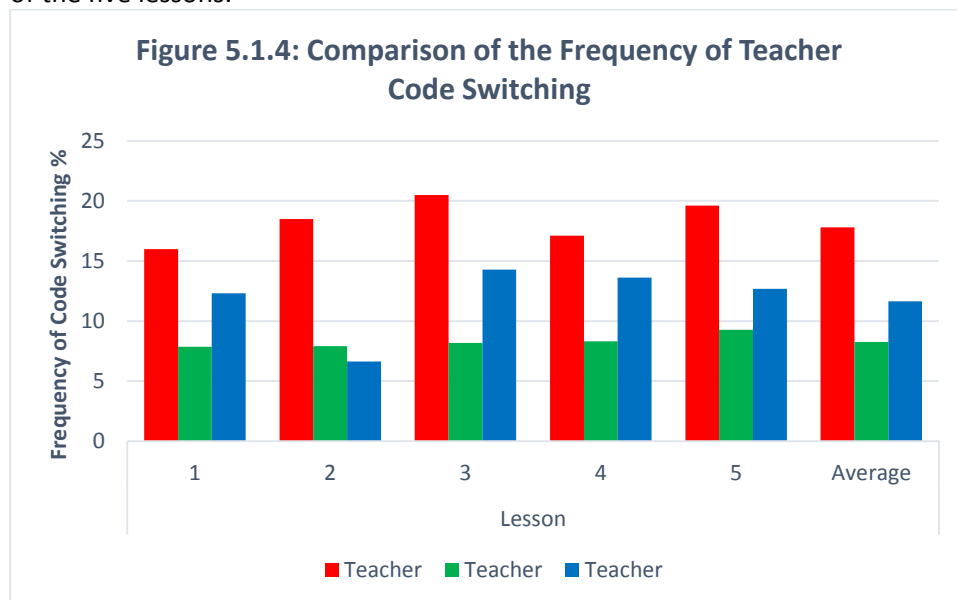
Figure 5.1.4 depicts that in all the five lessons, the three teachers' frequency of code switching varied across the five lessons. In each of the lessons, teacher A code switched more frequently than the other two teachers. Except for lesson 2, teacher B exhibited the least amount of switching during the teaching of trigonometry. On average teacher A (18%)'s code switching frequency is double that of teacher B (9%). During interviews, teachers A and C whose code switching frequencies are higher than that of teacher B, indicated that they attend Mathematics enrichment contact sessions at a

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nearby university. They are also attending an upgrade course for Further Education and Training (FET) teachers offered by another university.

## 5.2 Code Switching per Lesson Category



Figure 5.2.1: Teacher A:- Frequency of Code Switching per Category
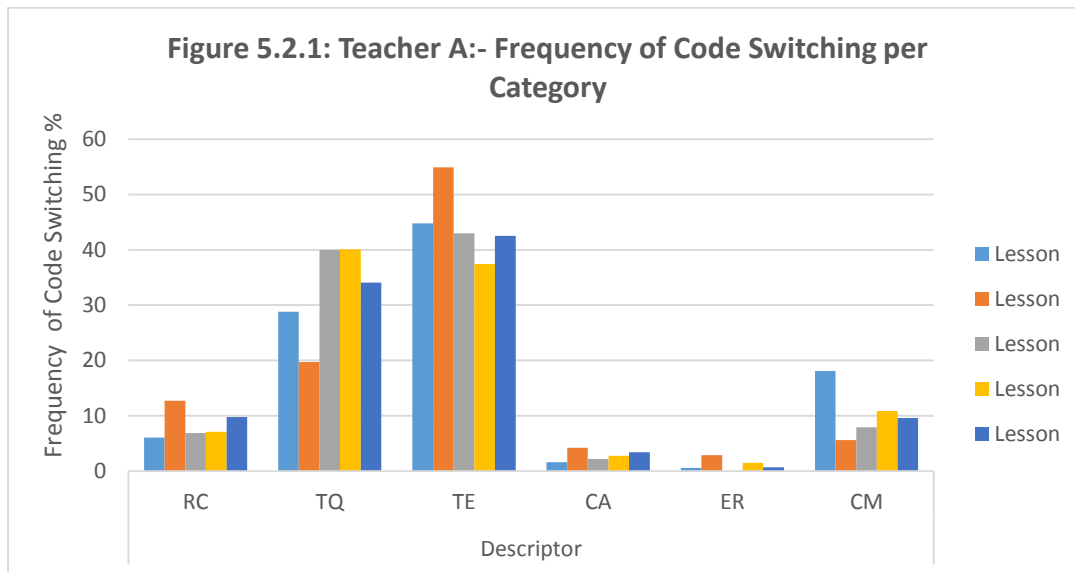
Figure 5.2.1 illustrates that most of teacher A's code switching occurred during TQ (average 31%) and TE (44%). Very little use of IsiXhosa was done during ER (5%). It is observable that within TQ and TE categories, code switching frequency into IsiXhosa varies across the five lessons.



Figure 5.2.2 Teacher B- Frequency of Code Switching per Category
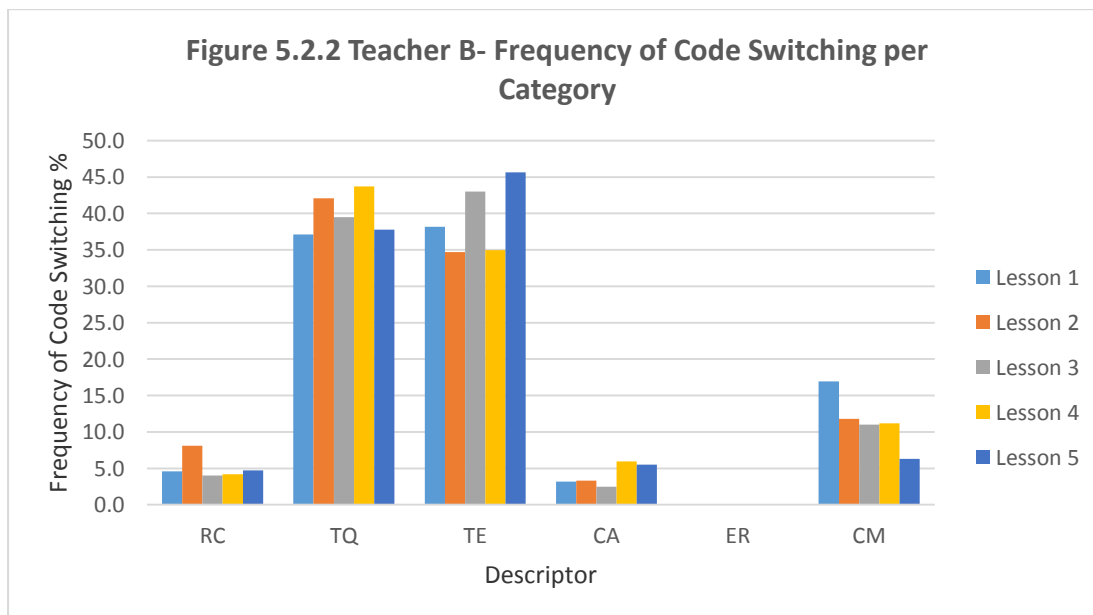
As is shown in figure 5.2.2, TQ (average 40%) and TE (average 39%) have the highest frequency. No code switching was done for ER by teacher B in all the five lessons. A considerable amount of switching into IsiXhosa was done for CM purposes. Code switching frequency for TQ and TE varied across the five lessons during the teaching of trigonometry.

**Figure 5.2.3: Teacher C- Frequency of Code Switching per Lesson Category**
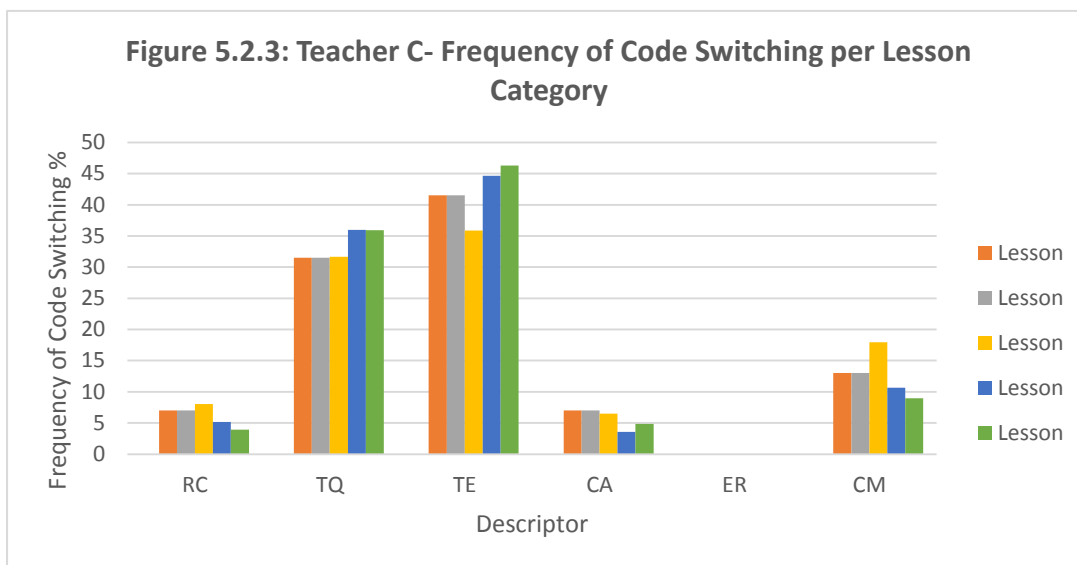
Figure 5.2.3 illustrates that teacher C has his highest frequencies of code switching during TQ (35%) and TE (42%) across the five lessons. CR has an average of 10% of the total classroom code switching. For teacher C, no ER were made in IsiXhosa. Frequency of TQ in IsiXhosa was fairly consistent over the five lessons while that for TE was not.



**Figure 5.2.4: Comparison of Teacher Code Switching per Lesson Category**
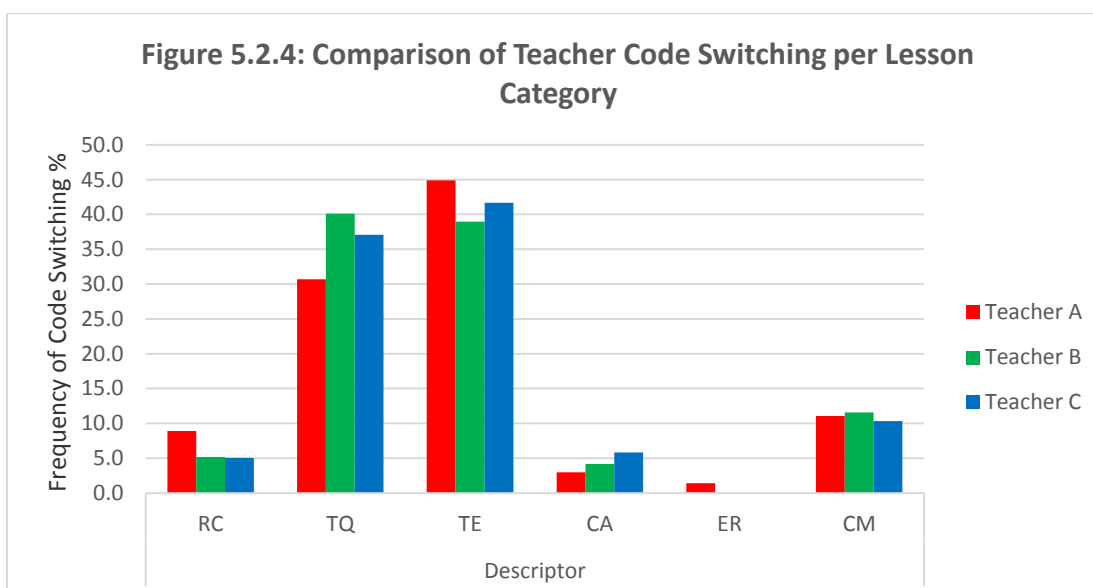
As indicated in Figure 5.2.4, in the teaching of Trigonometry, all teachers used IsiXhosa predominantly to ask questions-TQ- (A-31%, B- 40%, C-37%) and for the purpose of explaining concepts-TE- (A-45%, B-39%, C-42%). It is apparent that the consistency of the frequency of code switching into IsiXhosa across the teachers for TQ and TE respectively varies.

**5.3    Code Switching Across Domains of Mathematical Practice**

Figure 5.3.1: Teacher A- Code Switching Across Domains of Mathematical Practice
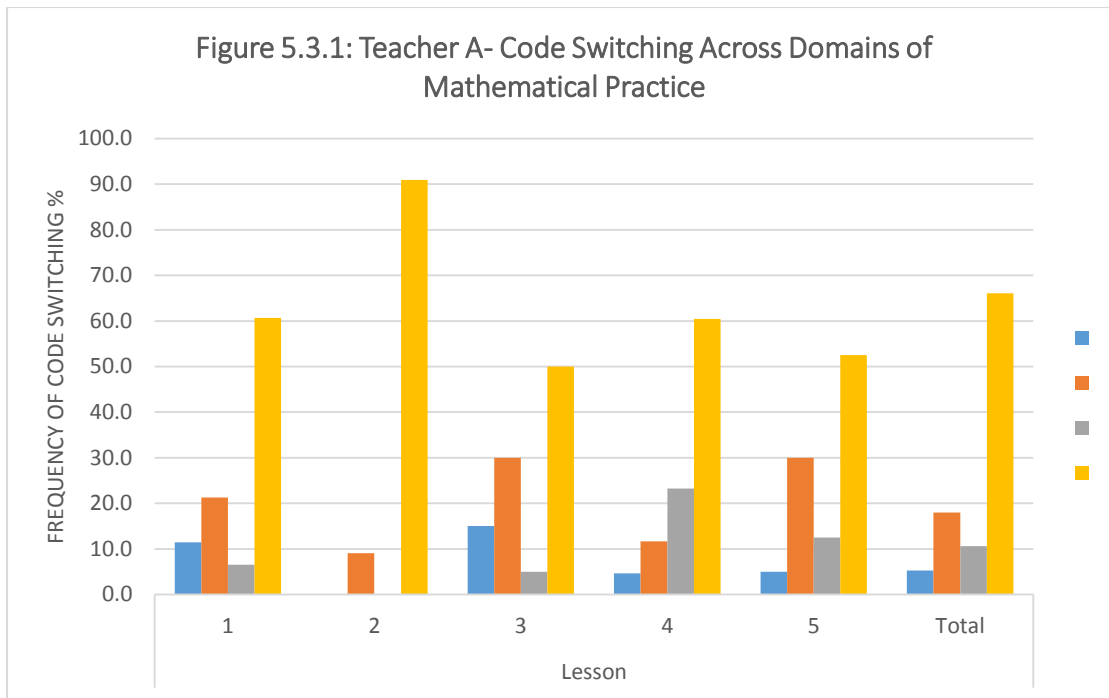
As can be observed from figure 5.3.1, teacher A consistently operated in the public domain throughout the five lessons. In lesson 2, the expressive and the esoteric domains were not exhibited in his IsiXhosa terms. The use of the other three domains varies across the lessons.



Figure 5.3.2: Teacher B-Code Switching Across Mathematical Domains of Practise
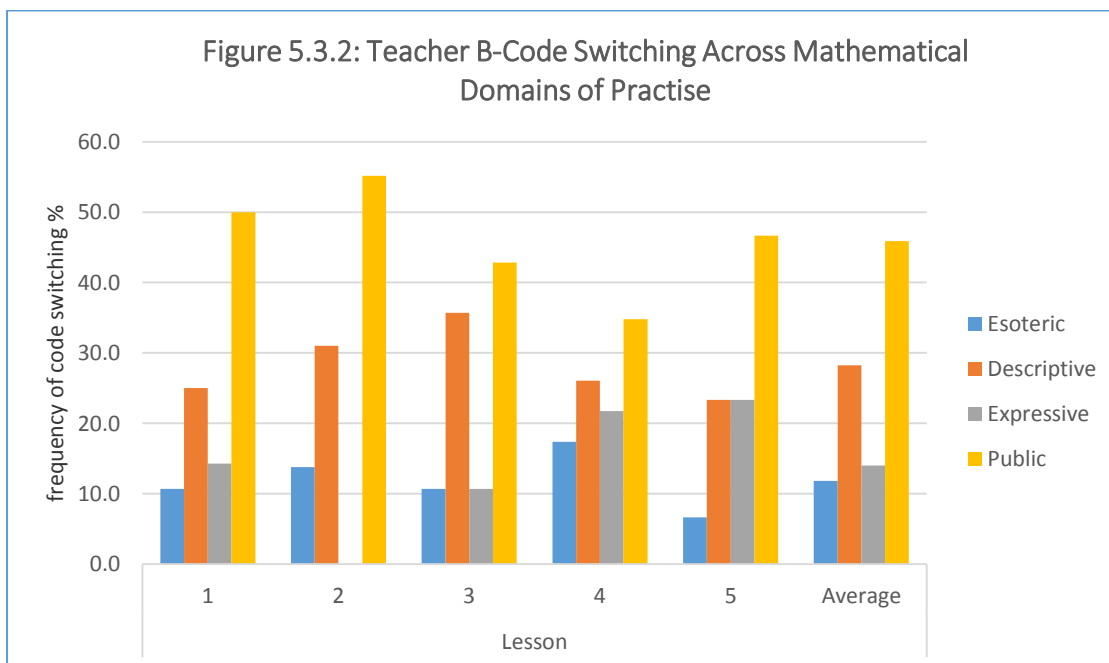
From figure 5.3.2, teacher B consistently code switched into the public domain (46%) mode and 28% in the descriptive domain throughout the five lessons. The esoteric domain (12%) has the least frequency on average.

Figure 5.3.3: Teacher C-Code Switching Across Mathematical Domains of Practice
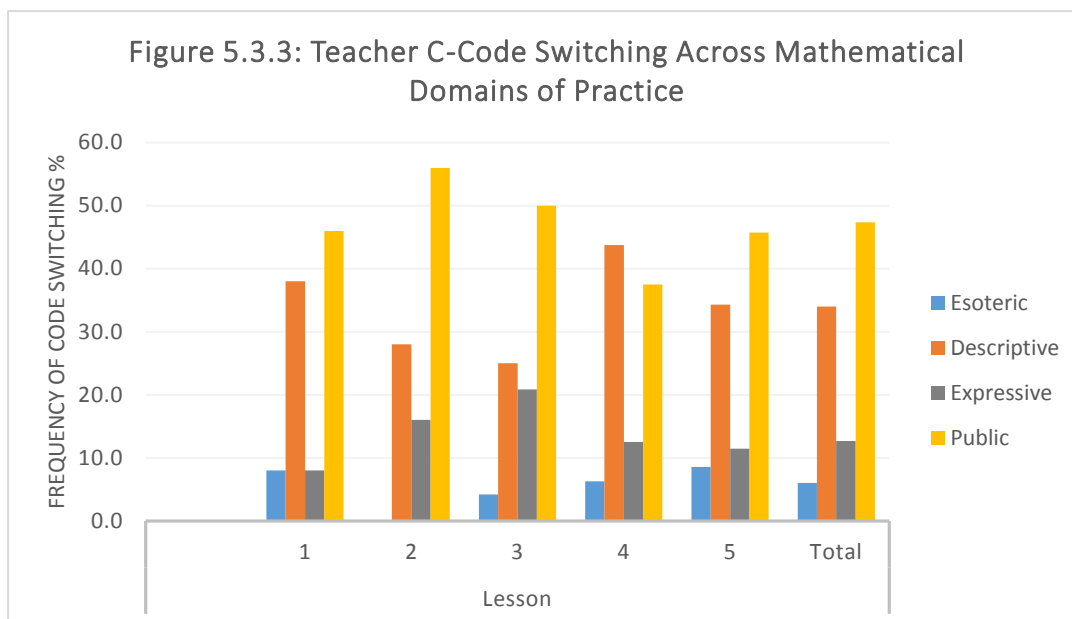
As illustrated in figure 5.3.3, the public domain (47% on average) and descriptive domain (34%) are dominant modes in which teacher C is operating. Only 6% of the total code switching is in the esoteric domain.



Figure 5.3.4: Comparison of Teacher Code Switching Across Mathematical Domains of Practice
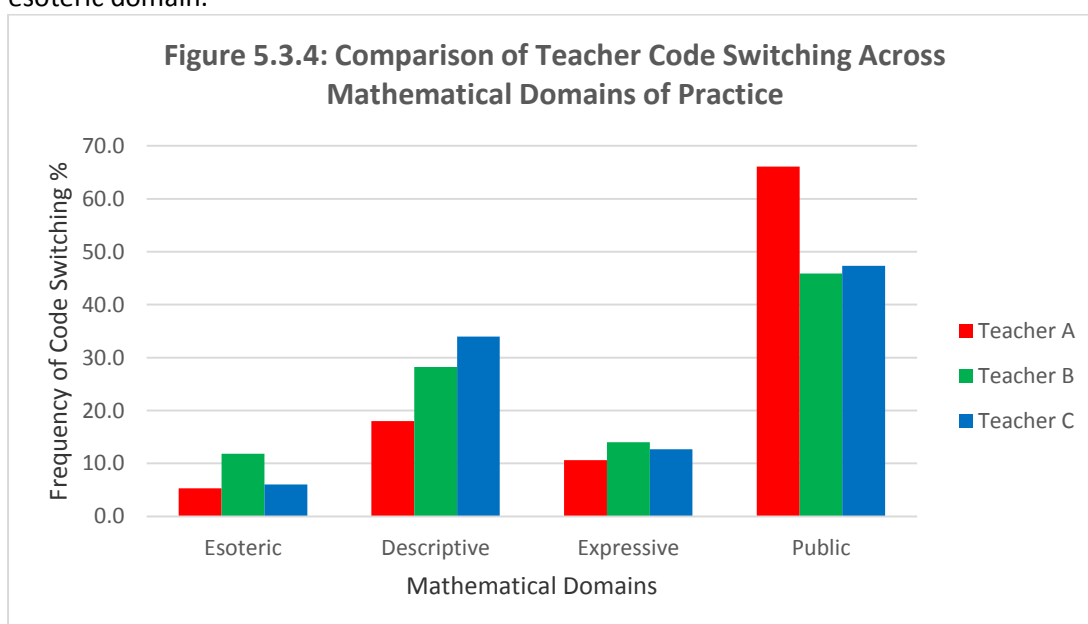
It was observed that all the participating teachers operated mostly in the public domain (A-66%, B-46%, C-47%) as is shown in figure 5.3.4. Very few of their IsiXhosa terms (A-5%, B-12%, C-6%) were in the esoteric domain.

Considering that most of the classroom code switching was done during questioning (TQ) and explaining (TE), and that all the three teachers operated mainly in the public domain, implies that teachers predominantly taught in the everyday domain. This, according to Dowling (1998), not much formal Mathematics is taught.

## 5.4    Document collection and analysis

Document collection and analysis revealed that only teacher A had some mathematical material in IsiXhosa even though she did not refer to it in her preparation for teaching. During interviews, teacher A said she had been given the book 'Understanding Concepts in Mathematics and Sciences

Vol 1 and 2 by Young et at (2009)'. On asked why, she stated that the terms used in the book were too deep for the students and unfamiliar. This result was also noted by Schafer (2010). Teacher A did not have any lesson notes nor lesson plans but used the textbook to pick examples and classwork.

Teacher B had lesson notes in all the five lessons inform of compilation of questions for class discussion, classwork and homework prepared in English. He pointed out that he did not have any mathematics material in isiXhosa. On being asked where and how he got his Xhosa vocabulary, the teacher said that "I rely on my own knowledge and understanding of Xhosa because it's my mother tongue. I do not have any textbooks or dictionaries for Mathematics in IsiXhosa."

Teacher C brought classwork for each of his students on photocopies and Power Point. All the charts and posters in his classroom were in English. On asked where he got his vocabulary, he said "I use my knowledge of Xhosa as it is my home language and I try to merge it with Mathematics. Some terms especially in this topic [trigonometry] are not there in my language [IsiXhosa] and that's not a problem because at the end of the day, students need to know Mathematics in English for exam purposes."

## 5.5    Qualitative analysis of observations for code switching consistency

Some mathematical words in IsiXhosa as used by the teachers, were followed up across lessons and teachers. Focus was on checking the teacher's consistent and precise use of these words congruent with mathematical definitions. In this paper, only three IsiXhosa words are considered, **fumana, bala,** and **abe yedwa.**

### 5.5.1    Fumana

Teacher A inconsistently used the word **fumana** in the first lesson. It was used to mean find and in some cases to mean calculate. Some of the situations in which it was used are given below:

So **u-AD simfumene ngubani** 14.1m (so we have found AD)
**Masijonge kengoku phaya ku-ABD, sizamfumana njani u-BD? (Let us look at ABD, how can we find BD?)**

In these three cases the teacher required the students to find a given quantity. In the case below, taken from the same lesson, the teacher wanted student to do the calculations.

**Calculate DC** andithi **(right)?** U-DC sizamfumana njani? **(How are we going to calculate DC)? DC, can you see DC, how to calculate DC?**
**Now calculate BC, how to calculate BC?** sizamfumana njani u-DC? **(How are we going to calculate DC?)**

In lessons 2-5, teacher A consistently used **fumana** to mean find.

Teacher B and C who used **fumana** less frequently than teacher A, did so consistently and precisely within and across all the lessons to mean find.

### 5.5.2    Bala

Teacher A used **bala** and **masicalculatheni** in the same lesson to mean calculate. Teacher inconsistently alternated between these words within and across lessons. The quotations below are from teacher A's lesson 3.

**Masicalculatheni i-height kengoku (let us now calculate the height)**

**Masibaleni kaloku nithini nina (calculate, what are you guys saying)**

The quotations below where taken from teacher A's lesson 5.

*Usibalele ke, sawufumana ntoni?* **(Calculate then, what do we get?)**

*Masiyeni masibaleni* **(let's go, start calculating).**

*Kuthwa masi calculate-e u-x phayanabendithe izolo* **(we are asked to solve for x, I told you yesterday).**

Teacher B used *bala* fewer times than the other two and it was consistent within and across lessons.

Teacher C used *bala* to mean various aspects as is shown in some of her quotations below:

*Xa u bala u zayibalela apha lento* **(when you calculate, you will calculate) using your calculator, isn't it?**

*Imizuzu endizayibala ke, ndim mos i-time keeper* **(the minutes that I will give you to work on the sum, I am the).**

*Masiye* **3minutes.** *Ndiyabala ke mna ukuqala ngoku*. **(Let's move, 3minutes. I am counting the minutes starting now.)**

*Bala* was used when teacher wanted students to calculate and when he meant counting. In teacher C's other lessons, *bala* was used to mean write.

*Ngubani obebala i-***same problem** *naye* (who had the same problem as her)?

**Please** *ningabi* **(don't be) serious** *nibale* **(writing), what is the missing angle** *kuqala* **(first of all)?**

**Now you can see the importance of having different colours** *xa ubala* **(when you're writing) especially with trigonometric diagrams**

**Qhayi is calculating, over to you Qhayi,** *bala ithini i-***answer** *yakho* **(calculate, what is your answer)**

Hence *bala* was inconsistently used within and across lessons by teacher C. It was used for three different activities, calculating, counting and writing.

### *5.5.3   Abe yedwa*

This phrase was used by teacher B only. It was consistently employed across and within lessons to mean 'make a given quantity subject of the formula'.

*Apha sifuna* **u-AD** *abe yedwa nhe (***here we want AD to be alone, right***)*

**Isolate AD,** *samshiya njani u-***AD** *abe yedwa phayana* **(how do we isolate AD)?**

*It means let's isolate Cos d, ashiyeke yedwa u-Cos d kwelacala akunjalo (leave Cos D by itself on the other side right)*

Though teacher B consistently used this phrase in and across lessons, it was not precise. ***Abe yedwa*** (must be alone) was found to be an everyday term and does not capture the whole essence of making the subject of formula.

## 6.      Summary of Findings and Conclusions

Teachers in this study spent on average 15% of the lesson speaking in IsiXhosa explaining concepts and asking questions. More than 50% of this talk was in the public domain. Considering that code switching happens mainly in informal, everyday languages and school mathematics texts are in formal and more esoteric language, there is an urgent need to reduce this gap. I argue that in order to introduce the formal Mathematical talk in indigenous languages, resulting in orienting the teacher's and students' oral language towards esoteric mathematical practices (Dowling, 1998), requires the development and use of best practices and guidelines for code switching. Mathematics teachers in multilingual classrooms need to be encouraged to plan and think about how, when and where they would need to use pupils' first language during teaching.

The presence of consistent and precise use of some translated terms within and across teachers and lessons by individuals located in different geographical places suggests that mathematical words exists in indigenous languages. Instances of inconsistencies observed in this study may be averted by collating and making key terms available in indigenous languages.

Teachers who participated in this study did not use any mathematical materials prepared in IsiXhosa. They relied on their own individual understanding and translations. Yet in those few instances they managed to code switch precisely and consistently with formal definitions of English Mathematics terms. With necessary support, through relevant and adequate teaching material, teaching Mathematics for conceptual understanding can be enhanced. Development of teaching materials in IsiXhosa that will aid the teaching of Mathematics at all phases is crucial. This study concludes that best practices for code switching need to be established to promote code switching that is systematic and beneficial to the conceptual understanding of Mathematics in secondary schools.

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# TEACHERS' PERCEPTION OF FACTORS THAT HINDER STUDENTS' ACHIEVEMENT IN BIOLOGY

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## Abstract

The study examined teachers' perceptions of factors that hinder students' achievement in Biology. A sample of 153 teachers responded to a 21-item questionnaire on correlates of language competence in biology. Using relative frequencies of biology teachers' responses, analysis of data identified nonchalant attitudes, declining reading culture and misinterpretation of questions, linguistic interference of mother tongue with English, visual illiteracy, wrong spellings, limited biological vocabulary and defective study habits as some of the factors that might impede students' performance and interest in biology classrooms. Hence, it is suggested that continuous exposure of students to effective reading culture, constructive English language skills, good teaching with multimedia devices, and remediation of emerging learning difficulties can enhance their language and communicative competence, comprehension and achievement in biology.

## Introduction

Creative verbal and analytical skills in coherent observations, abstraction and description of basic concepts and processes can enhance students' language competence and performance in Science, Technology and Mathematics (STM) programmes. But numerous studies have consistently confirmed that English Language is the most serious obstacle against Nigerian learners' struggle towards academic success (Ayodele, 1986; Igbure, 1987). Could the fluctuating achievement and interest in Senior Secondary School (SSS) biology be linked with the recurrent students' difficulties in reading comprehension, explanation, illustration, expression and presentation of the subject matter in English Language? A skilful use of words, in addition to the adoption of mental images, often makes for greater flexibility and precision (Sharp, 1975; Holliday, 1976) in clear understanding and retention of biological concepts. Such a rational disposition to learning could possibly ease the enunciation of fundamental scientific concepts and processes in Nigerian senior secondary schools.

Meanwhile, the greatest shortcomings of many secondary school students seem to result from their poor articulation and attitudes towards learning of biology (WAEC, 1984, 1985; Usua, 1974; Oyekan, 1993, 1995; Ahmad & Asghar, 2011, Akinwumi & Oluwafoise, 2011). The prevalence of poor spoken and written English, even among university graduates, was blamed on the absence of a compulsive reading habit in the society (The Punch, 2014). What then prevents interplay of language competence and performance in biology? Perhaps the main dilemma with the students' inability to commit thoughts coherently into writing is hinged on poor conceptual understanding and use of the language.

Obemeata (1978) observed further that many Nigerian children are victims of proficiency in the English Language as they speak very little at home. The problem worsens when they are also allergic to reading biology and allied science books for recreational pleasure, qualitative knowledge, incisive understanding and creative application of the subject matter someday. Their limited competence in the use of English language is likely connected with our bilingual or multilingual environments which do not offer many opportunities to hear and speak English, the second language (Osisanya, 1978; Afolayan, 1991). Understandably, many children are more engrossed in their mother tongue which

structurally differs and interferes with the medium of instruction, interaction and communication in the biology classrooms. This seems to make a substantial proportion of biology students to be handicapped by and operate with a severely limited range of vocabulary in our multilingual and pluralistic society.

**Theoretical Framework**

English language is a core foundation subject that is being studied and used as a medium of instruction throughout the schooling period as a second or foreign language. Being a coded system of words, phrases or signs that expresses feelings and ideas about the world, it seems language is very important to logical thinking, cognitive retention and expression of biological concepts in writing. In consonance with McCarthy's (1952) opinion, language is a major key to the child's mental life as a basic mastery of linguistic skills is an essential pre-requisite for academic achievement. Language also serves as a means of exploring, understanding and gaining control of one's world; establishing relationships with others; and developing aesthetic and moral sensibility (Downey and Kelly, 1979; Strevens, 1986). Since language affects total behaviour when being used by students to conceive and explain learning activities in and out of the school, it becomes apparent that English language and thought cannot be separated from classroom instruction and achievement in biology.

As language is so central to all human learning experiences, such children with poor linguistic powers are likely to be progressively retarded in logical reasoning, verbal interaction, operational and descriptive knowledge of their world, concept formation, and cognitive retention of biological content. In other words, educational failure might result from sociolinguistic differences between the school and pupils (White, 1974; Stubbs, 1976). Hence, science teaching can be regarded as a sociolinguistic behaviour as biology education is anchored on the acquisition of communication and analytical skills to explore a wide spectrum of biological concepts and processes by direct experience of things in nature. Downey and Kelly (1979) believed that perceptual concepts and some practical ones can be learned without language but abstract, logical, and relational ones which constitute the basis of scientific and mathematical reasoning inevitably rely on suitable use of language. Meanwhile, students who study biology frequently encounter and have to learn new technical vocabulary as a threshold of linguistic competence and performance. The level of attainable word power, through time, is bound to affect the quality of learning activities such as problem-solving, observation, reading comprehension, abstraction, discussion and retention of biological concepts and processes.

**Objectives**

Since much formal school learning depends on the use of language, the problem of teachers is to identify the source of linguistic disadvantage (Downey and Kelly, 1979). Attempts have been made by Usua (1974) and Oyekan (1995) to scrutinise the secondary school pupils' class notes, workbooks and scripts towards identifying a catalogue of language-related students' weaknesses. Such identified factors which hinder students' achievement in Biology are often exemplified by poor conception, limited vocabulary, defective reading, spelling mistakes, scanty description of biological concepts, and misuse of scientific terms or words.

The purpose of this study was to identify the basic correlates of language and communicative competence associated with achievement among the Senior School Certificate (SSC) biology students in Nigeria. It was intended to highlight and suggest plausible solutions to learning problems associated with students' language competence in the use of English for effective learning, understanding, retention and application of biological concepts beyond the classroom situations.

**Method**

A sample of 153 practising career teachers that teach SSC biology was utilised for the investigation. A 21-item questionnaire titled Correlates of Language Competence in Biology (CLCB) was developed, validated and used for data collection. It was given to teachers to tick (√) the appropriate column of students' weaknesses as factors which could inhibit students' conceptual understanding and achievement in SSC biology: Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). They were considered as impediments to analytical, communication and presentation skills that are used in observation, abstraction, manipulation, description, retention and application of biological knowledge to everyday life.

The resulting data were analysed by using relative frequencies of practising teachers' perception of factors that could hinder students' achievement in Biology. Those correlates of language and communicative competence that did not secure an aggregate of 75 in Agree dimension (SA+A) on an Agree-Disagree continuum representing fifty per cent of the sample respondents were rejected for their inconsequential impact on students' achievement in SSC biology classrooms.

**Results and Discussion**

Analysis of data depicted in Table 1 showed that most of the teachers perceived students' weaknesses associated with their language competence as factors which severally hinder their academic achievement in SSC biology. It could be further observed that language deprivation, absence of science clubs, inadequate exposure to well-stocked library, poor writing of experimental and field-study reports, and failure to realise the pervasive influence of English on other subjects were not considered to have substantial impact on students' language competence in learning and performing well in biology.

**Table 1: Frequency Distribution of Correlates of Language Competence in Biology**

| | Correlates of Language Competence | SA | A | SA+A | D | SD | D+SD |
|---|---|---|---|---|---|---|---|
| 1. | Nonchalant attitudes towards learning and use of English as a second language | 103 | 35 | 138 | 14 | 1 | 15 |
| 2. | Careless reading and misinterpretation of the questions or activities | 90 | 37 | 127 | 10 | 16 | 26 |
| 3. | Linguistic interference of the mother tongue with English Language | 60 | 65 | 125 | 21 | 7 | 28 |
| 4. | Poor understanding of English Language in classroom practices. | 55 | 67 | 122 | 25 | 6 | 31 |
| 5. | Visual illiteracy occasioned by inability to observe and describe forms and functions of organisms and relevant apparatus | 46 | 75 | 121 | 23 | 9 | 32 |
| 6. | Declining reading culture for pleasure to knowledge acquisition | 75 | 45 | 120 | 20 | 13 | 33 |
| 7. | Failure to write the correct spellings of scientific names and terms | 97 | 21 | 118 | 27 | 8 | 35 |
| 8. | Inability to listen, comprehend and jot down correct notes during biology lessons | 65 | 48 | 113 | 29 | 11 | 40 |
| 9. | Limited range of biological vocabulary and restricted verbal interaction | 62 | 49 | 111 | 26 | 16 | 42 |
| 10. | Inadequate learning environment that lacks problem-solving activities, free discussion, creative listening and self-expression in good English | 59 | 50 | 109 | 38 | 6 | 44 |
| 11. | Poor understanding and misuse of appropriate | 54 | 42 | 96 | 52 | 5 | 57 |

| | | SA | A | SA+A | D | SD | D+SD |
|---|---|---|---|---|---|---|---|
| | biological terms and words. | | | | | | |
| 12. | Scanty and incoherent description of biological concepts and processes | 40 | 54 | 94 | 47 | 12 | 59 |
| 13. | Adoption of defective study habits | 36 | 52 | 88 | 25 | 50 | 75 |
| 14. | Failure to purchase and read standard biology texts and leisure story books | 39 | 49 | 88 | 38 | 27 | 65 |
| 15. | Inability to carefully read and strictly comply with guiding instructions | 30 | 49 | 79 | 43 | 31 | 74 |
| 16. | Inability to interpret and apply biological information in life situations | 25 | 52 | 77 | 36 | 40 | 76 |
| 17. | Failure to realise the pervasive influence of English Language in the teaching, learning and achievement in other subjects e.g. biology, chemistry, mathematics | 6 | 9 | 15 | 68 | 70 | 138 |
| 18. | Poor writing of experimental and field-study reports | 6 | 11 | 17 | 97 | 37 | 134 |
| 19. | Inadequate exposure to well-stocked library with biology and allied books | 8 | 12 | 20 | 104 | 29 | 133 |
| 20. | Absence of science clubs as a forum for the exchange of ideas and skills | 10 | 22 | 32 | 70 | 51 | 121 |
| 21. | Language deprivation resulting from children's impoverished home environment | 14 | 18 | 32 | 89 | 32 | 121 |

Key: SA: Strongly Agree; A: Agree.          Total Respondents that Agreed = SA+A;
      SD: Strongly Disagree; D: Disagree.     Total Respondents that Disagreed = D+SD.

The above evidence in Table 1 established some perceived correlates of language competence in students' achievement associated with differential comprehension, retention and communication of biological concepts in the teaching-learning continuum. This corroborates findings of previous studies (Oyekan, 1995; Ogunniyi, 1986; WAEC, 1985; Stubbs, 1976; Usua, 1974; McCarthy, 1952) that students' achievement is a function of their language and communicative competence. In other words, students' achievement in biology is honed on analytical, communication and presentation skills in creative observation, manipulation, abstraction, description and application of basic concepts and processes in biology to everyday life.

The results of this study showed that teachers' perceptions of factors associated with language and communicative competence that hinder students' achievement in Biology were:
1. Nonchalant attitudes toward learning and use of English as a second language
2. Careless reading and misinterpretation of questions or activities
3. Linguistic interference of mother tongue with English language
4. Poor understanding of English language in classroom practices
5. Visual illiteracy occasioned by inability to observe and describe forms and functions of organisms and relevant apparatus
6. Declining reading culture for pleasure or knowledge acquisition
7. Failure to write the correct spellings of scientific names and terms
8. Inability to listen, comprehend and jot down correct notes during biology lessons
9. Limited range of biological vocabulary and restricted verbal interaction

10. Inadequate learning environment that lacks problem-solving activities, free discussion, creative listening and self-expression in good English
11. Poor understanding and misuse of appropriate biological terms and words
12. Scanty and incoherent description of biological concepts and processes
13. Adoption of defective study habits
14. Failure to purchase and read standard biology texts and leisure story books
15. Inability to carefully read and strictly comply with guiding instructions
16. Inability to interpret and apply biological information in life situations.

These students' weaknesses should be identified and rectified by teachers, parents, and schools. Biology teachers should engage in quality teaching with concrete explanations, regular assignments, theoretical discussions and practical work hinged on exploration of the environment, and continuous assessment of learning outcomes as means to improve students' interest, conceptual understanding and academic achievement.

A glance at Table 1 shows that nonchalant attitudes towards the learning and use of English, careless reading and misinterpretation of questions, linguistic interference of the mother tongue with English, poor understanding of English in classroom practices, and visual illiteracy constituted more serious language problems in biology classrooms. They may progressively hinder logical thinking, cross-sex interactions and communication of biological concepts and phenomena in English Language. The National Policy on Education's (Federal Republic of Nigeria, 2004) support for bilingualism in the initial use of mother tongue and English later can help to break ethnic, racial and communication barriers in the acquisition of relevant knowledge and expertise in modern science and technology within the ambit of our culture. But the sullen emphasis on mother tongue without adequate forum for transition to English particularly in Junior Secondary School (JSS) curricular programmes often precipitate a legion of students' weaknesses and underachievement in the course of learning of biology. In some cases, mother tongue is interposed in the teaching of Integrated Science, the prerequisite to the choice and learning of Biology in SSS classes. Such an instructional practice may culminate in poor understanding of English language, misinterpretation of biology questions, and linguistic interference of the mother tongue with English while thinking and committing biological ideas into writing.

Although traditional African science suffers from lack of proper scientific process of investigation, explanation and coding, the difficult concepts being faced in STM bear foreign names, are hardly commonly observed in our culture and therefore difficult to learn (Eshiet, 1994). The resulting visual illiteracy and incoherent description of biological concepts and processes due to their limited range of biological vocabulary tend to induce poor performance and undue vilification of biology among the school subjects. Unless this sociolinguistic gap between the personnel, creative language of the student and the impersonal language of science is bridged, students may continue to see science as a foreign culture being imposed upon them (Ogunniyi, 1986).

The results further indicate the prevalence of declining reading culture and limited range of biological vocabulary, failure to buy relevant books and write correct spellings of scientific terms, inability to comply with guiding instructions and apply biological information in life situations, misuse of appropriate biological terms, incoherent scanty description, and inadequate learning environment that deactivates communication skills as a host of difficulties which interfere with effective teaching and learning of biology. The general wave of societal indiscipline for materialism and aversion towards education could have contributed to the declining learning environment and reading of biology books.

Finally, language deprivation resulting from children's impoverished home environment, absence of science clubs and exposure to well-stocked library with biology and allied books, poor reports of experiments and field studies, and failure to realize the pervasive impact of English Language on other subjects were given inconsequential rating by the teacher respondents. It should be noted that students from poor parents in a multilingual-multicultural society without sufficient opportunities to learn and use English Language may have limited vocabulary for learning and writing reports of experiments and field studies in biology. The absence of science clubs and well-stocked library could also prevent meaningful interpersonal relations, acquisition of essential knowledge, and exchange of skills necessary to facilitate biology learning and achievement.

Furthermore, failure to realise the pervasive influence of English Language in the teaching, learning and assessment of nearly all other subjects including biology seems to make the students sacrifice less amount of efforts and time for its effective study. Since the teaching-learning process in biology is centred on English Language, more priority attention and infrastructures should be given for its continuous acquisition and use. This supports Bloom and Lahey's (1978) observation that normal language development is a successful child's interaction with the context: form, content and use. It implies that listening-speaking-reading-writing continuum represents the natural sequence of language growth. Hence, children should be brought up in social and learning environments that readily promote problem-solving, creative listening, free discussion and self-expression in good spoken or written English. The level of students' language and communicative competence attained in these settings can enhance cognition, achievement and inclination towards biology education.

Teachers have varied abilities to make a subject interesting and meaningful in their bid to facilitate coherent learning and achievement motivation. Biology and English language should be taught functionally in small active groups with the use of laboratories, personal experience of nature and Nigerian life, and a variety of instructional materials centred on concrete illustrations. To buttress this view, Richards (1978) identified the following activities as basic components for a language (behaviour) of a biology teaching:

1. explanation of the meaning of technical terms;
2. use of relatively short sentences;
3. repetition of sentences carrying important basic concepts;
4. expansion of definitions using simpler and comprehensive language and;
5. use of simpler language in explanations.

The foregoing pedagogical efforts to ease learning and retention of biological concepts call for organised educational practices that will encourage incisive reading with understanding, expression of ideas with requisite brevity and clarity in good English, dictation of biological terms/words and instant correction of spelling mistakes therein, and prevention of noise interfering with the reception of information in biology classrooms. Hence, students' language competence and performance in SSC biology can be strengthened with effective use of chalkboard; instructional materials; experiments; field studies with expressive exploration of nature; diagnostic remedial instruction; and leisure reading of novels, science magazines and newspapers.

Adequate language competence which grows incrementally through an interaction of reading, discourse, writing and experience in a lifelong process of learning biology may foster the spirit of creativity and innovation in tackling the problems of individuals and the society. Attainment of this goal for corporate improvement of humanity inevitably requires personable dynamic teachers who are creative and innovative in their instructional leadership roles. Hence, they should skilfully

provide a platform for extensive exploration of the environment and community resources, viable study habits, and constructive communication skills ingrained with wilful determination to arrest the perennial problem of underachievement in SSC biology. This can be accomplished and sustained with effective guidance techniques in intensive reading, summary, note taking, descriptive analysis and presentation of biological concepts and processes in English language.

## Conclusion

The study identified some factors associated with language and communicative competence which hinder students' achievement in SSC biology. Such learning difficulties can impede effective acquisition of analytical, communication, and presentation skills in observation, retention, description and application of biological concepts to everyday life. Remediation of these students' weaknesses in use of English will help to upscale academic interest, standard of biology education and strong foundation for healthy and prosperous nation.

Hence, it is hoped that continuous exposure to English Language, exploration of the environment, expression of ideas with requisite brevity in writing, and remediation of emerging students' weaknesses can provide the framework for language facility, and improved academic performance in biology. Students could be made to equally discuss biological issues with colleagues and correct their mistakes as viable means to improve their language and communicative competence. This may stimulate academic interest in meaningful learning and enhanced achievement among the SSC biology students.

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# ASSESSMENT FOR LEARNING USING TETS WITH THE AID OF CLICKER MOBILE TECHNOLOGY

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**Abstract**
The purpose of the current study was to investigate whether assessment for learning using technology-engagement teaching strategy (TETS) with the aid of clicker mobile technology improves pass rates. Data was collected by means of mixed method. Participants were 240 students registered for Mathematics II at a study university of technology in South Africa. This article reports on the efficacy of assessment for learning using TETS with the aid of clicker mobile technology to promote participation, engagement and interaction and to improve the pass rate. The results showed that the effective application of clickers with the incorporation of a TETS using clicker mobile technology improves pass rates among students. The results also showed an increase in the number of students who passed the tests from 73.4% to 91.6% where TETS was incorporated. It is recommended that higher education institutions support assessment for learning and provide appropriate technology for positive outcomes.

**Keywords**: Assessment for learning, technology-engagement teaching strategy, clicker mobile technology and pass rate.

## INTRODUCTION

Institutions of higher learning worldwide are constantly searching for improvements in their education systems, which include pass rates of students. Generally, assessment is one of the most significant areas of an educational system  (Swearingen, 2002; Waycott, Gray, Thompson, Sheard, Clerehan, Richardson, 2010). In fact, assessment assists student learning and identifies students' strengths and weaknesses (Swearingen, 2002). In this regard, assessment for learning is used in conjunction with formative assessment (Barret, 2004). Formative assessment is assessment that takes place during the learning process to find out whether students understand the concepts and are able to process and think widely with the information gathered and through the provision of information about performance (Yorke, 2003).

It should be mentioned though that most of higher education institutions' assessment policies – internationally and nationally – hinder academics in changing assessment techniques (Norton, Aiyegbayo, Harrington, Elander & Reddy, 2010) to fit the 21st century methods of teaching and learning where technology plays a major role (Barret, 2004; Simelane & Dimpe, 2013). A call has been made by (Whitelock and Brasher, 2006) for the incorporation of emerging technologies and Web 2.0 technologies in forming future formative e-assessment (Pachler, Daly, Mor, & Mellar, 2010). E-assessment is regarded as the main driver of both summative and formative e-assessments.

In recent years, students in higher education have been highly engaged with the Internet, mobile technologies and Web 2.0 tools such as wikis, blogs, Facebook, Twitter, MySpace, many other social networking sites and other technological gadgets (Simelane & Dimpe, 2013). In fact, these technologies have created opportunities for more flexible and easily accessible learning and assessing environments in higher education. Mobile learning has become popular and has swept the world like a wildfire, growing, gaining and contributing to technological advancement (Farkas, 2013). In fact, mobile technologies have a significant effect on teaching and learning as well as assessment.

The increase in mobile devices has opened up new pedagogical possibilities for making learning seamless, contextualised and personalised (Farkas, 2013). The mobile technology that was used in this study was the personal response system, commonly known as a clicker. Clickers increase students' preparedness to learn by determining their own mistakes (Simelane & Skhosana, 2012; Simelane, Mji & Mwambakana, 2011). Clickers have a potential to promote heutagogy (self-directed and self-determined learning) (Hase & Kenyon, 2001).

This article reports on the efficacy of assessment for learning using TETS with the aid of clicker mobile technology to promote participation, engagement and interaction and to improve the pass rate of second-year mathematics students. In order to do this, we will firstly discuss the weekly formative tests which were conducted in order to establish the changes in students' academic performance and to prepare them for summative assessment. Secondly, we will explain how clicker mobile technology was implemented to promote participation, engagement and interaction and to improve the pass rate. After the teaching and learning and integrating clickers, a survey questionnaire was administered. Students' perspectives on the usefulness of clickers in teaching and learning were also examined using the same questionnaire. The results showed that the effective application of clickers with the incorporation of a technology-engagement teaching strategy (TETS) using clicker mobile technology improves the pass rate among students.

## RELATED WORK

### Assessment for learning

Assessment for learning has been presented (Barrett, 2004) to assess the majority of the attention paid to assessment of learning or performance assessment in classrooms. Actually, assessment for learning assists lecturers to check learning in order to decide what to do next (Barrett, 2004). It involves both monitoring to track student progress and scaffolding to point out and assist students to know in which area they need to improve. It could be an influential tool for promoting student learning. It involves students mostly in order to improve their learning. It has been pointed out that assessment for learning is used in conjunction with formative assessment (Barrett, 2004). Boud and Associates (2010) support Barret (2004); Whitelock and Brasher (2006) and further indicate that assessment for learning requires to be placed at the centre of subject and programme design as it is the integral part of the curriculum planning from the initial stages of the development of the courses.

### Mobile learning

Mobile learning or m-learning is any form of learning that takes place through a mobile device (University of Wollongong, 2008). It is pointed out that mobile learning is more than just providing content that is accessible on a mobile device (Farkas, 2013). In fact, mobile technologies have a great influence on teaching and learning as well as assessment. In recent years, mobile technology has even emerged in the form of smart phones, apps, iPads, personal response systems (clickers), tablet computers, blogs, instant messaging and social networking sites (Simelane & Skhosana, 2012). This emergent trend means that mobile technologies have impacted positively in different contexts, including the education sector (Simelane et al., 2011). Mobile technologies enable teaching methods to follow the same trend.

M-technologies are powerful learning tools in higher education. The University of Wollongong (2008) points out that the current use of m-technologies appears to be primarily within a didactic, teacher-centred paradigm, rather than a more constructivist environment. M-learning promotes a constructivist learning environment as well as collaborative and contextual learning. In most cases, authentic learning activities in higher education involve these characteristics (Herrington, 2006). The most significant benefit of m-technologies is that they permit students to apply their learning in a real or realistic context that leads to better learning. M-learning supports and engages students at different levels, providing richer and more contextualised learning experience. Learning does not

happened in a vacuum. The context and application are the fundamentals of learning. Mobile technologies can connect users to additional information.

**Clickers in teaching and learning**

Clickers could be used for different purposes such as checking students' attendance, student lecturer evaluation and for administrative purposes. Simelane et al., (2011) developed a teaching strategy for using clickers for continuous assessment as well as assessment for learning to encourage active learning. Simelane and Skhosana (2012) elaborated on the technology-engagement teaching strategy (TETS). TETS is grounded on principles of assessment for learning that support teaching and learning goals, content knowledge, learning to learn, students' assessment capabilities, communication and engagement (Ministry of Education, 2011). In order to apply these principles, TETS was effectively used as a question-guided teaching-interchange discussion to promote interaction, participation and engagement, continuous assessment or formative and e-formative assessment. TETS played a major role when lecturers and students sought to achieve the outcomes of the lesson. TETS was used to test post-knowledge of weekly lectures. Clicker tests were conducted to test whether students could synthesise the concepts and apply higher-order learning to solve mathematical problems (Simelane et al., 2011; Simelane & Skhosana, 2012).

Literature (Lee, Feldman and Beatty, 2012) revealed that, even though clickers proved to be successfully implemented in teaching and learning, lecturers encountered challenges such as hardware and software problems, using technology, time and curriculum pressure, question development, integration of clicker strategy in the curriculum, classroom discussion, students and practising formative assessment. Despite these challenges, it was pointed out that the most beneficial aspect of clickers when used for assessment for learning was that it has the potential to keep students motivated and engaged in classroom activities (Carnevale, 2005; Duncan, 2007). It provides immediate feedback allowing students to measure their understanding of the concepts (Lantz, 2010). Furthermore, clickers increase students' preparedness to learn by determining their own mistakes (Blood & Gulchak, 2012). Literature defines heutagogy as a study of self-determined learning. It is concerned with learner-centred learning that sees the learner as the major agent in his/her own learning, which occurs as a result of personal experiences (Hase & Kenyon, 2001).

**METHOD**

A mixed method was used. Qualitative and quantitative data was collected by means of three clicker formative tests, a semester test and survey questionnaire and a summary report. Qualitative data was analysed using Atlas.ti 5.0 and quantitative data was analysed using SPSS 21.

**PARTICIPANTS**

Participants were 240 students registered for Mathematics II at the study University of Technology in South Africa. These students were registered for the Diploma in Chemistry, Electrical Engineering and Surveying where mathematics is a prerequisite. As a prerequisite, the implication is that students cannot proceed without passing the subject. The second-year mathematics syllabus covers Newton-Raphson, Trapezium and Simpson, Gauss elimination, differentiation of inverse trigonometric and hyperbolic functions, parametric functions, optimisation and Maclaurin series, integration, partial fractions, chain rule and rate of change, direct integration and separation of variables.

**INSTRUMENTS AND PROCEDURE**

Data was firstly collected using clicker formative tests during the implementation of the TETS. Secondly, data was also collected by means of a survey questionnaire about the use of clicker technology and students' perspectives, which included a section that requested the students to

provide biographical data such as age, gender, course, year of registration, etc. Thirdly, data was collected by means of a summary report. The results of the semester test were also used as an instrument to validate the success rate of the students.

**Clicker formative test**

The aim of the clicker formative tests (CFTs) was to ensure that students interact and engage during the class. Students were able to measure their understanding of the concepts by the feedback provided by the system. CFTs increase students' preparedness to learn by defining their own mistakes. It also encourages heutagogy. There were three weekly CFTs conducted. CFT 1 consisted of five questions testing the knowledge of application of differentiation, application of integration, and optimisation. The CFT 2 consisted of five questions testing the knowledge of application of integration. Furthermore, The CFT 3 consisted of five questions testing knowledge of knowledge of optimization.

**Semester test**

The semester test was a paper-based test, which tested students on their knowledge of differentiation and integration as well as differentiation of inverse trigonometric and hyperbolic functions. It covered work completed from week 1 to week 5.

**Clicker mobile technology survey questionnaire**

A 15 - item scale survey questionnaire on teaching and learning, assessment for learning using clicker technology as well as students' perspectives on the use of clickers in teaching and learning was administered. The first category was about teaching and learning using clicker mobile technology. This category comprised six questions. The second category comprised five questions about assessment for learning. The third category comprised four questions about students' perspectives on the integration of clicker technology in teaching and learning. In the first section, students were requested to provide data about teaching and learning using clickers where students registered their view on a 5-point Likert-type scale anchored by 1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree and 5 = strongly disagree. In this instance, the aim was to establish how clickers were used in the classroom. For example, students had to rate the items –

I.    Using clickers assisted me understand the concept better

II.   Clicker questions helped me know how well I was learning.

In the second section, students were requested to register their views on a 5-point Likert-type scale anchored by 1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree and 5 = strongly disagree. In this case, the aim was to gather students' views about the use of clicker mobile technology for assessment for learning. For example, students had to rate the items:

I.    Clicker assessment activities in class motivated me to actively engaged and do well in mathematics.

II.   Clicker assessments motivate me to learn and find out more about the subject.

In the third section, students were requested to register their views on a 5-point Likert-type scale anchored by 1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree and 5 = strongly disagree. In this case, the aim was to gather students' views about the use of clicker mobile technology in teaching and learning. For example, students had to rate the items:

I.    I dislike using clickers in class.

II.   We should continue use clickers in class.

### Summary report

A summary report was administered. It focused on a qualitative analysis of the experiences of the 240 participants during the intervention data phase. This was to ensure data triangulation, and to support statistics with the views of the participants. In fact, the summary report was used to eliminate the bias of a single method. During the post-intervention data phase of the study, students were requested to write a summary report. The summary report comprised four items. Students had to respond to items such as:

I.   Describe your experiences of using clicker technology in class.
II.  What did you like about the teaching and learning of Mathematics using clickers in class?

### RESULTS

In this section the results of the participants, CFTs, semester test and students' views on the use of clicker mobile technology will be presented.

### Participants

Of the participants, 132 (55.0%) were female and 67 (27.9%) male, while 41 (17.1%) did not indicate their gender. Their ages ranged between 18 and 44 years median ($M$) = 21.59, standard deviation ($SD$) = 3.195) while 27 (11.3%) did not indicate their age. The results revealed that 181 (75.4%) of the students indicated that they were registered for the course for the first time, 59 (24.6%) of the students revealed that they were repeating the course, 37 (15.4%) were repeating the course for the first time, and 22 (9.2%) were repeating for the second time.

### Clicker formative tests and Semester test

Three clicker formative tests were conducted. In CFT 1, 233 (97.0%) of the students took the test while 7 (3.0%) did not take the test. In total, 171 (73.4%) of the students passed the test and 62 (26.6%) failed the test. The $M$ = 1.01 and $SD$ = 1.668. In CFT 2, the $M$ =.06 and $SD$ = 3.277. In all, 211 (87.9%) of the students took CFT 2. In total, 185 (87.6%) of the students passed and 26 (12.4%) failed the test. Of the students, 29 (12.1%) did not take the test. In CFT 3, 237 (98.8%) of the students took the test and 3 (1.2%) students did not take this test. Of the students, 217 (91.6%) students passed and 20 (8.4%) failed. The $M$ = .16 and the $SD$ = 2.937. In the semester test, 237 (98.8%) of the students took the test while 3 (1.2%) did not take the test. In total, 172 (72.6%) of the students passed the test and 65 (27.4%) failed the test. The $M$ = 1.03 and $SD$ = 1.993. Table 1 below shows the frequency distribution and percentages of the at-risk students or failing and the correlation between CFT 1, 2 and 3.

**Table 1:** Frequency distribution and % of at-risk students and correlation clicker formative test (CFT) 1, 2, 3 and semester test.

| Test | CFT1 n = 233 | CFT2 n = 211 | CFT3 n = 237 | Semester n = 237 |
|------|--------------|--------------|--------------|------------------|
| Pass | 171 (73.4) | 185 (87.6) | 217 (91.6) | 172 (72.6) |
| Fail | 62 (26.6) | 26 (12.4) | 20 (8.4) | 65 (27.4) |
| Missing | 7 (3.0) | 29 (12.1) | 3 (1.2) | 3 (1.2) |

### Students' views on the use TETS with the aid of clicker mobile technology

Of the students 111 (46.3%) responded to a questionnaire. and 129 (53.8%) did not respond. The students' view will only include the data of 111 students. The students' score were $M$ = 33.63 and $SD$ = 9.424. When looking at the scores for the entire questionnaire with 15 items for internal consistency, Cronbach's alpha (Cronbach, 1951) were 0.80 values obtained. The alpha values were fair (in other words, < .70 unacceptable; ≥ .70 < .80 fair; ≥ .80 < .90 good; ≥ .90 excellent) (Cicchetti, 1994). The validity of the instrument was accepted. Reliability was acceptable here because the

internal consistency of scores from the participants was equal to 0.80. Table 2 shows the factor-loading factor for the rotated factor and Cronbach's alpha reliability scores for each item.

**Table 2**: Factor-loading factor for the rotated factor and Cronbach's alpha reliability score.

| Scale | Factor | | |
| --- | --- | --- | --- |
| | Clickers for teaching and learning | Assessment for learning | Students' perspectives |
| CTL 1 | .788 | | |
| CTL 2 | .777 | | |
| CTL 3 | .799 | | |
| CTL 4 | .782 | | |
| CTL 5 | .782 | | |
| CTL 6 | .789 | | |
| AL 7 | | .792 | |
| AL 8 | | .817 | |
| AL 9 | | .805 | |
| AL 10 | | .786 | |
| AL 11 | | .786 | |
| SP 12 | | | .805 |
| SP 13 | | | .842 |
| SP 14 | | | .788 |
| SP 15 | | | .793 |

*CTL = Clickers in teaching and Learning
*AL = Assessment for Learning
*SP = Students' Perspective

**Summary report**

The summary report were analysed using Atlas.ti 5.0 version. I created a Hermeneutic unit called Data 05 December 2012 with 2 primary documents from a summary report and created 11 conceptual networks. These conceptual networks emerged from the questions asked about teaching and learning of mathematics with the integration of TETS using clickers. Typical examples of the questions were '*Describe your experiences of using clicker technology in class?* From this question, I identified 74 codes. I grouped codes into 15 themes that relate to what students experiences about clickers in teaching and learning of mathematics. These 15 themes include new, good, simple, engagement, confidence, thinking, motivation, time, immediate results, technology, memorandum, and multiple-choice questions save money, accommodate slow learners and reduce work for the lecturer. The reliability and validity were assured through the researcher consulting colleagues and mathematics lecturer at a study university. Once more, the lecturer also checked the Atlas.ti coding. The colleagues and the lecturer felt that the instrument was objective and credible thus assuring trustworthiness. Because of this, content validity of the categorisation of the students summary reports was accepted in this study.

**DISCUSSION**

In the study on which this article reports, the results showed that 59 (24.6%) students were repeating the course. This rose concerned in this study; for this reason, assessment for learning using TETS was employed. Attention was given to these students in order to ensure improvement in their academic performance, enhance their learning and increase the pass rate. It may be argued that the influence of TETS using clicker mobile technology was to improve assessment practices and the quality of learning (Boud & Associates, 2010).

When looking closely at the three CFTs we see an increase in the number of students who passed the tests from CFT1 73.4% to CFT3 91.6%. These results revealed that incorporating TETS using clicker mobile technology in teaching and learning assisted the lecturer to monitor students, track student progress, scaffold and help students to identify their weaknesses and improve their academic performance (Barrett, 2004). These findings were supported by some of the students indicating their experience of using clicker technology in class. Students said that they learned to work fast, to concentrate, to put more effort into their work and to understand what they were doing in class. Other students mentioned that clicker mobile technology was interesting and that it required understanding of the work. Using clickers was fun and made learning exciting. We also observed a slight improvement 72.6% in students' academic performance and pass rate in semester test as compared to three CFTs. Sixty five students failed the semester test. It may be argued that these students were in the group that missed some of the CFTs. It may also be argued that the integration of technology in pedagogy might have a positive impact. Because students revealed that using clickers was fun and made learning exciting. The majority of the students indicated that studying using technology was interesting and motivating. Students also revealed that clicker technology made it easier to learn.

The findings show that TETS using clicker mobile technology was supported by the majority of the students. The students revealed that they gained much from using clicker mobile technology in class. They indicated that clickers provided a fast and easy method of assessing. Other students indicated that clickers saved time. They remarked that, even though they had to work out the answer first, it saved time and they received their marks quickly. The majority of the students also revealed that they gained much from using clicker mobile technology in class. They indicated that clickers provided a fast and easy method of assessing. Other students indicated that clickers saved time. They remarked that, even though they had to work out the answer first, it saved time and they received their marks quickly. Yet other students mentioned that they obtained good marks through observation and listening by using clickers in class and clickers helped them not to lose concentration in class. One of the students said that she had gained knowledge by using clickers, and experienced the advantage of solving problems as fast as she could. The majority of the students believed that clickers could improve learning and encourage thinking. Some of the participants said clickers improved their learning and it showed only the correct answer, which helped them to work hard before choosing the correct answers from the options given. Clicker mobile technology improves learning ability and it gives users time to think before selecting the answer. Other students indicated that clicker mobile technology allowed students to interact with each other. Results showed that students felt that clickers were relevant and useful tools to be applied in teaching and learning.

Clicker mobile technology allowed various types of questions, but in this article, multiple-choice questions were used. It is pointed out by Haladyna, Downing and Rodriguez (2002) that if multiple-choice questions (MCQs) are carefully designed and the guidelines for using MCQs are followed properly, such questions could facilitate deep and active learning. Different thinking levels of Bloom's taxonomy could also be established with MCQs (Haladyna, Downing, & Rodriguez, 2002, p. 324). The effective use of MCQs with the integration of clicker mobile technology gave students a personal space to evaluate themselves and to apply their creativity and critical thinking when solving mathematical problems. Regarding multiple-choice questions, students revealed that such questions make them think deeply. The effective use of MCQs reinforces accuracy. One of the student said accuracy was vital and indicated absolute understanding. The argument with the TETS using clicker mobile technology is that TETS fosters contingent teaching and assessment for learning. The lecturer and students become flexible to the learning content and the lecturer checks learning in order to decide what to do next (Barrett, 2004, p. 4).

## CONCLUSION

In this study, we saw how assessment was incorporated with the TETS using clicker as one of the important area of teaching and learning. This was observed from the CFTs that student' academic performance increased during the learning process where students were able to think widely about the information, understanding and processing of concepts. This was also observed by how technology particularly clickers was used to meet the demands of the 21st century teaching and learning. When TETS using clicker mobile technology was implemented we saw an improvement in assessment practices and the quality of learning (Boud & Associates, 2010). Findings in this study revealed that TETS using clicker mobile technology was implemented effectively. Most of all, the majority of the students in this study supported the use of clicker in teaching and learning.

## RECOMMENDATIONS

It is recommended that higher education support assessment for learning and provide appropriate technology for positive outcomes. It is important for the lecturers to use a teaching strategy that allows the integration of technology and pedagogy. It is also crucial for other higher education institutions to adopt TETS using clicker mobile technology to foster contingent teaching.

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# AN INVESTIGATION OF DIFFICULT TOPICS IN THE SENIOR SECONDARY SCHOOL MATHEMATICS CURRICULUM AS PERCEIVED BY STUDENT TEACHERS

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## Abstract

This study investigates difficult topics in the senior secondary school Mathematics curriculum as perceived by student teachers. The study also investigated the influence of teachers teaching experience and gender differences on their perception of Mathematics topics. The participants consisted of 30 male and 30 female students drawn from two tertiary institutions in Lagos state through stratified random sampling procedure. The relevant data were generated using Mathematics Topic Difficulty Assessment Questionnaire (MTDQA). The instrument has a reliability coefficient of 0.87 when tested during the pilot study. Five hypotheses were formulated and tested all at 0.05 level of significance. Results obtained indicated that there exist a significant difference of teachers teaching experience and there were no significant gender differences on their perception of Mathematics topics. Based on the findings of this study, some conclusions were drawn and recommendations were made.

**Keywords:** Difficult Topics, Student Teachers, Gender

## Introduction

Mathematics is a useful tool in the society, more so in the present technology age. No wonder Mathematics is a compulsory subject at primary and secondary school levels, though, not all the student are expected to become Mathematicians, but because of it application in everyday life (Oladele, 2004). For a person to be able to function very well within his immediate environment, the knowledge of rudimentary Mathematics is very necessary. Babalola (1991) viewed mathematics as a basic tool in the development of science based knowledge such as technology, industry and even for sound analytical reasoning in daily living in a modern society such as ours.

The purpose of mathematics in our secondary schools curriculum cannot be over-emphasised as there is no single and all-embracing answer to what mathematics is? Mathematics means many and varied things to different people in view of its universality and diversity. It is referred to as the Language of science and technology; Queen of science: Science of counting, number, quantity and space; Study of abstractions and their relationships etc. Hornby (1980) defines mathematics as the science of sizes and numbers of which arithmetic, algebra and trigonometry are branches. The encyclopedia of mathematics has it that mathematics is the science of quantitative relations and spatial forms in the real world, being inseparable connected with the needs of technology and natural sciences. Thus, mathematics is a field of symbolic representation of ideas and relations. It can also be seen as an instrument for effecting a logical examination for the implementation of different ideas. Mathematics is a subject needed at all levels of our educational system, which involves calculations and useful in everyday life. The National Policy on Education states that the broad aims of secondary education are preparation for useful living within the society and for higher education. The general objectives for secondary mathematics education drawn up by the federal ministry of education are as follows to: generate interest in mathematics and provide a solid foundation for everyday living, develop computational skills, develop precise, logical and abstract thinking etc. The Nigerian mathematics curriculum is subject centered as well as student centered. It also emphasizes meeting of learner's development needs and interest. According to Ifejika (1991) it is designed to produce sound and effective citizens in Nigeria. There are evidences to show that

student cognitive and effective attitude falls below expectation. Concerned stakeholders have been making various efforts to ensure that these problems, which attributed to poor achievements in mathematics as well as poor attitude towards the subject, are identified and tackled effectively. Some of the key issues affecting poor performance can be detected through critical examination of students' selection of question at terminal examinations and their general performance in the question so selected. It has also been observed that students like avoiding questions in some particular topics during examination. Another observed fact is the recurring pattern of poor performance in such topics. This is because those topics stimulate fear and anxiety on students, they are unpopular topics and require more effort and skills before one can understand and solve them. Few student attempts such questions and they are usually found in part two of theory papers and carry more marks. Due to the fact that either they have not been taught the topics or their teachers have been avoiding them.

This situation calls for a planned approach which should be based on realistic diagnosis of needs, problems and solution processes. Hence, there is the need in identify the difficult topics in the senior secondary mathematics curriculum so as to ensure that corrective measures are taken to facilitate and improve performance.

### Statement of the Problem

Empirical studies on the perception of difficult topics at the secondary and tertiary level have focus on Biology, Physics and Chemistry (Oyedokun, 2002 Oyedeji, 1992 & Jimoh, 2001). This present study focuses on student teachers' perception of difficult topics in both junior and senior Secondary School mathematics Curriculum.

Researchers have noted that some topics are not too easy to teach by teachers due to its demanding and abstract nature. These are topics which the students also finds difficult to understand. This topics have the following characteristics: they are hard to understand by most students; they require more effort and skills before one can understand and solve them; they exist in both senior and junior secondary; such topics stimulate fear and anxiety on students; they are unpopular topics; students do not find examination in those topics easy to solve, few students attempt such questions; the few that attempt them usually score low; high achiever in mathematics experience a little difficulty in solving questions on such topics when compared with other topics;

Students are prone to various errors in solving such topics; they consist mostly of abstract topics; they are usually found in part 11 of the theory paper and carry more marks and are usually responsible for the general poor performance in mathematics and if properly taught students will discover that they are not difficult as they suppose, these difficult topics can be regarded as skipped topics because of the following reasons: some teacher omits teaching the topics deliberately because they themselves do not understand them; some of those who venture to teach it may leave it in a hurry and teach only the rudiment aspect; they fail to teach students how to solve questions relevant to the topics. Students run away from attempting questions set on such topics especially if given a choice. It is essential that these difficult topics should be identified so that the way of making them easy for students will be evolved. The study thus focuses on investigation of the problems highlighted and how to find appropriate remediation, hence, the need for the study.

### Research Hypotheses

The following research hypotheses were tested in this study:
1. There is no significant difference in the senior secondary Mathematics Curriculum as perceived difficult by student teachers.

2. Student teachers teaching experience does not have significant significant influence on there level of perception of the difficult topics.
3. There is no significant gender difference in student teachers' perception of difficult topics in Mathematics.
4. The nature of the schools attended by Mathematics student teachers does not have a significant influence on their perceived difficulty levels of the topics.
5. The subject combination of student teachers does not have any significant influence on their perceived difficulty levels of the topics.

**Research Methodology**

The study was a descriptive survey. The population for the study consisted of all student teachers who were pursuing Sandwich Degree Programme in two tertiary institutions. Sixty (60) mathematics students in the 2012 contact session participated in the study. The students in the sample were holders of the National Certificate in Education (NCE) In Chemistry/Mathematics (Che/Mth), Mathematics/Physics (Mth/Phy), Computer/ Mathematics (Comp/Mth), Mathematics/Integrated Science (Mth/Int), Mathematics/Economics (Mth/Eco), Mathematics/Geography (Mth/Geo). Table 1 below shows the sample according to school attended, gender and subject combination of the student teachers.

**Table 1: Number of Respondent in the Subject Combinations**

| S/N | School Attended | Male | Female | Mth/ Geo | Eco/ Mth | Mth/ Phy | Chm/ Mth | Mth/ Int | Mth/ Comp |
|-----|-----------------|------|--------|----------|----------|----------|----------|----------|-----------|
| 1 | State COE | 14 | 19 | 2 | 16 | 5 | 6 | 1 | 3 |
| 2 | FCE | 16 | 11 | 1 | 10 | 5 | 5 | 3 | 3 |

**Instrumentation**

The only instrument used to collect data for the study was the Mathematics Topic Difficulty Assessment Questionnaire (MTDAQ). Section A of the questionnaire was on bio-data information such as gender teaching experience, name of the school attended and qualifications. Section B consisted of 15 specific topics in the NECO/WASSCE syllabus covering trigonometry, algebra and statistics. The 30 item questionnaire was a 3 point likert scale and respondents were asked to respond by ticking the appropriate response in order to indicate their preferences.

**Validation of Instrument**

The research instrument was validated by two experienced Mathematics teachers from Federal Government College, Ijanikin Lagos and experts in Test and Measurement from the Department of Educational Foundations, University of Lagos.

**Data Analysis**

The sixty (60) student teachers completed the questionnaire and the data obtained *were* subjected to appropriate statistics. The difficulty of a particular topic is determined by the value of mean as follows:-

Mean less than 1.5 ($1.0 < x < 1.5$) ---→ Easy
Mean between 1.5 and 3 ($1.5 < x < 3$) --→ Difficult.

To determine whether gender difference, teaching experience and the school attended influence teachers' perception of difficult topics, the data was subjected to mean, standard deviation, variance and t-test statistics. To determine the influence of teachers' teaching experience on

perceived difficulty levels of topics, teachers with less than five years teaching experience were regarded as less experienced (LE) while those with five years and above were classified as highly experienced (HE). Students' T-test statistics was used to determine the influence of gender difference and teaching experience on perception of difficulty levels in Mathematics topics. To determine whether subject combination influence student teachers' perception of Mathematics topics, the data was subjected to Mean and Anova statistics.

**Results**
**Table 2: Mean of Teacher's Perception of Difficulty of Mathematics Topics**

| S/N | Mathematics | Mean value |
|---|---|---|
| 1 | Trigonometry | 1.57 |
| 2 | Mensuration | 1.60 |
| 3 | Probability | 1.85 |
| 4 | Statistics | 1.75 |
| 5 | Arithmetic and Geometric progression | 1.90 |
| 6 | Longitude and Latitude | 1.82 |
| 7 | Graphs and inequalities graph | 1.46 |
| 8 | Bearing and Distances | 1.57 |
| 9 | Construction | 0.97 |
| 10 | Sets theory | 1.23 |
| 11 | Circle Geometry | 1.41 |
| 12 | Numbers and numerations | 2.15 |
| 13 | Algebraic process | 1.30 |

From the table, number and numerations has the highest mean value of 2.15, followed by arithmetic and geometric progressions of 1.90 and the least mean score was 0.97 .it shows number & numeration at 0.05 level of significant was found to be the most difficult topic, followed by arithmetic & geometric progression ,longitude & latitude while construction was seen as the cheapest topic in both junior and senior secondary ,followed by sets theory and algebraic theory .

**Table 3: T-test to show influence of Teaching Experience on Perception of Mathematics Topics.**

| Variable | N | X | S.D | $S^2$ | d.f | t-cal | t-critical | P |
|---|---|---|---|---|---|---|---|---|
| Highly experienced | 23 | 1.35 | 0.95 | 0.90 | 58 | 2.35 | 1.67 | S |
| Less experienced | 37 | 2.12 | 1.83 | 3.35 | | | | |

**Table 4: T-test to show Gender Difference on Perception of Mathematics Topics**

| Variable | N | Mean | S.D | $S^2$ | d.f | t-cal | t-critical | P |
|---|---|---|---|---|---|---|---|---|
| Male | 30 | 1.62 | 0.98 | 0.16 | 58 | 1.52 | 1.67 | NS |
| Female | 30 | 1.19 | 1.32 | 1.74 | | | | |

**Table 5: T-test to Show Perception of Mathematics Teachers that Attended Federal and State Colleges of Education**

| Variable | N | Mean | S.D | $S^2$ | d.f | t-cal | t-critical | P |
|---|---|---|---|---|---|---|---|---|
| FCE | 27 | 1.95 | 0.86 | 0.74 | 50 | 1.46 | 1.67 | S |
| STATE COE | 33 | 2.01 | 0.95 | 0.90 | | | | |

**Table 6: ANOVA Showing Influence of Subject Combination on Teachers Perception of Mathematics Topics**

| Variable | N | Mean | D.F | S.S | M.S | f-cal | f-critical | P |
|---|---|---|---|---|---|---|---|---|
| Chm/Mth | 11 | 24 | 4.55 | 181.7 | 67.4 | 2.70 | 2.53 | S |
| Mth/Phy | 10 | 23 | | | | | | |
| Comp/Mth | 6 | 21 | | | | | | |
| Mth/Int | 4 | 16 | | | | | | |
| Mth/Geo | 3 | 17 | | | | | | |

Table 6 shows the ANOVA test result carried out to verify the significant difference of subject combination on teachers' perception of mathematics topics.

**Findings**

1. The teachers perceived 8 topics in the senior secondary Mathematics curriculum as difficult topics to teach. These topics are: trigonometry, mensurations, probability, statistics, arithmetic & geometric progression, longitude & latitude, bearing & distances and numbers & numerations. These are topics that have mean value of 1.50 & above.
2. The teachers' teaching experience influenced their perception of the difficulty levels of the Mathematics topics
3. Gender does not influence the perception of student teachers on the difficulty levels of the Mathematics topics.
4. The type of school attended by student teachers does not influence their perception on the difficulty levels of the mathematics topics.
5. Student Teachers' subject combination influences, the perception of difficulty levels of the Mathematics topics.

**Discussion of the Findings**

The outcome of this study revealed that Mathematics student teachers perceived about half of the senior secondary Mathematics topics as difficult to teach as showed in Table 2. Perhaps the low performance of Mathematics students at the WASSCE cannot be surprising since teachers can only teach what they know. Table 3 shows the influence between teachers' teaching experiences on perception of difficult topics in senior secondary Mathematics curriculum. The t- calculated (2.35) obtained is higher than t-critical (1.67) at 0.05 level of significance. It implied then that, the teaching experience of the teachers influenced their perception of mathematics topics. These findings are in line with an adage that says "experience is the best teacher".

Table 4 shows that there is no significant gender difference in student teachers perception of Mathematics topics. The t-calculated (1.52) is lower than the t-critical (1.671) at 0.05 level of significance. The findings of this study are in line with those of Adedayo (2006) and Adeleke (2007) who found that gender difference of the teachers does not influence their perceptions of difficult levels of topics in Mathematics. Table 5 shows the perception of teachers that attended Federal and State Owned Colleges of Education on Mathematics topics. The t-calculated (1.46) is lower than t-critical (1.67) at 0.05 level of significance. The study showed that the type of school attended by student teachers (State COE or FCE) had no influence on their perception of Mathematics topics. Table 6 shows the influence of subject combinations on perception of Mathematics topics. The F-calculated (2.70) is greater than F-critical (2.53) at 0.05 level of significance. The study showed that

student teachers' subject combinations influence their level of perception of Mathematics topics. The findings on mathematics topics mostly disliked by the majority also corroborate the WAEC chief examiner's (2007 - 2012) reports. The report showed that majority of the candidates avoided questions on geometry, bearing, and trigonometry, longitude and latitude since they are imaginary lines that are not vestry. Students' dislike could be as a result of the abstract nature of topics. For instance many students might find it difficult to understand the concept feasible in the real sense. Also, to effectively learn some of this disliked topic effectively, students need to possess mathematical tools which many students do not have. Preference for learning activities that are less tasking could serve to explain why student dislike some topics in mathematics such as geometry, bearing and trigonometry.

Gender is found not to be impacting on students' preference for mathematics topics. These findings corroborate with the view of Huitt (2003); Sadker & Sadker (1994a) that sitting in same classroom, reading the same textbook, listening to the same teacher, boys and girls perceive thing same ways. The findings also support the position of Honey and Hawkins (1991) that female and male perceived mathematics in related topics in related manners.

## Recommendations
The following recommendations are proffered
1.  There is the need for the NCE and degree Mathematics curriculum to be reviewed by NCCE and NUC. More O level topics should be included in the reviewed curriculum review, as a way to reduce the difficulties being experienced by student teachers.
2.  Mathematics teachers should be encouraged to attend seminars, workshops and conferences so as to expose them to new findings in Mathematics.
3.  Mathematics teachers and teachers in training should re-double their efforts in the teaching of Mathematics topics to ensure coverage of syllabus and it application so as to demystify the topics
4.  Professional bodies like Mathematics Association of Nigeria (MAN) and National Educational Research Development Council (NERDC) should come with recommended textbooks in Mathematics that will assist teachers to overcome the difficulties they experience in the teaching of Mathematics.
5.  Mathematics teachers are encouraged to do frequent revision exercises with their students in order to enhance student's mastery/retention of various knowledge and skills gains in previous lessons.

## Conclusions
Based on the findings and discussion it would therefore be concluded that Mathematics teachers perceived that about half of the mathematics topics were difficult. The study revealed that teachers' teaching experience influence their perception of mathematics topics while gender difference of the teachers has no influence on teachers' perception of Mathematics topics.

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# PROMOTING ACTIVE LEARNING IN HIGHER EDUCATION THROUGH THE USE OF SOCIAL MEDIA: EXPERIENCE OF UNIVERSITY OF VENDA

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## Abstract

Academic institutions across the world are at a turning-point with regard to pedagogy. Social media networks (SMN) have created a phenomenon in higher education learning landscape in which students spent a substantial amount of their time on social media. Educators should look to internet and social media networks to mediate and enhance their teaching. The harnessing of social media networks into traditional pedagogy has the advantage of extending lecturer-to-students contact hours beyond the normal class hours; seeking and giving assistance any time of the day. The purpose of this study is to examine the use of social media networks among university students and lecturers for educational purposes, critically paying attention on how social media is used, achievements made and challenges encountered. Furthermore, the study seeks to gain an understanding of how university policies on the use of information and communications technology (ICT) and internet promote or discourage the use of social media for educational purposes at the university. The study adopts a mixed model approach of research – utilizing both qualitative and quantitative data collection and analysis techniques. The target population for the study is undergraduate students. Random sampling was used to select 79 students (43 male and 36 female) aged between eighteen and thirty-five years. A purposive sample of 6 lecturers involved in undergraduate teaching is incorporated for the study. The study is underpinned by the connectivism theory. SPSS and content analysis methods were used for data analysis. The empirical study found that more than 90% of the students under study use social media networks (mainly Facebook, WhatsApp and MySpace) for both social interaction with their colleagues and for educational purposes. The majority of students indicated that the use of social media gave them an opportunity to reach-out to their lecturers "anywhere-anytime" for advice and guidance. The study found that there is no clear university policy in place with regard to the use of social media networks for both social and academic purposes and as such, lecturers are undertaking self-initiatives to improve their teaching to suite the ever changing taste of the twenty-first century 'socially-connected-students'. The study conclude by recommending institutions of higher learning considering broadening their scope of delivery to student using SMN to design proper learning material to assist students cope with the new changes in pedagogy. Educators should also be prepared to commit themselves in setting up the learning platform. Furthermore, in order to maintain high standards and achieve learning goals, universities should establish clear policy on the use of internet and SMN for educational purposes so that both educators and students are in one accord.

**Keywords:** Active learning, Connectivism theory, Higher education, Pedagogy, Social media networks.

## Introduction

Social media describes any form of technological systems that are linked to collaborations and community, comprising social networking sites (Ratnesary & Rasiah, 2013). Social media networking constitute modernization mostly defining "technological tools that stress the social facets in form of a funnel for communication, collaborative learning, and inventive expression; this is

also to boost education in higher institution of learning" (Al-rahmi et al, 2014:211). The ever-growing accessibility and "popularity of opinion-rich resources such as online review sites and personal blogs, new opportunities and challenges arise" (Parlakkılıç, 2014:40) as students can now actively use ICTs to voice-out and solicit the opinions of others. The digital-era students of today no longer accept purely face-to-face approach to teaching – they prefer active learning that promotes creativity, self-autonomy and flexibility of learning (Kop, 2011). Chief among the widely used SMN by people from all walks of life across the world are Facebook, Twitter, WhatsApp and MySpace. The continuous development of such technological advances and innovations calls for today's educators to be well-prepared and contemplate new approaches to teaching in-order to harness information and communication technology (ICT) skills into their pedagogy. Teachers should first acquire the necessary skills and knowledge required to empower their students with the benefits technology offers; they should teach the courses effectively, incorporating social media and by so doing support academic development in their students (Parlakkılıç, 2014).

The incorporation of digital technology via social media networks has the capacity to enhance team-based pedagogical sound learning platform and group collaboration outside the classroom - thus complementing the traditional face-to-face lessons (Beqiri, 2014). Social media networks can be used in higher education in four ways: firstly, for social interaction, problem solving and collaboration with other students; secondly as a learning platform for educators and students to share lecture notes, assignments and other course content; thirdly to increase students' participation in the virtual classroom and; finally for student project supervision whilst off-campus.

The constantly shifting landscape of higher-education and the inevitable tremendous diverse in our 'tech-savvy' crop of students forces today's educators to carefully select modern teaching-skills and utilise transformational-teaching and learning techniques that are considered appropriate and relevant. Facebook and Twitter with their numerous applications supporting teaching and learning has the capacity to cultivate positive-learning experiences as well enhancing the rapport between the educator and their students (Mazer et al. 2007). Nevertheless, educators should carefully plan and cinder the use of such technologies for educational purposes as they yield undesirable results if not properly integrated into the teaching curriculum. First and foremost, educators must have a strong understanding of their students' "academic and social backgrounds before reflecting and planning their lessons, the pedagogical techniques they intend to use and the types of assessments that they believe will highly engage their students in the learning process" (Ratneswary & Rasiah, 2013:370).

This study critically investigates the use of Facebook and WhatsApp as active-learning-tools for an undergraduate Professional Ethics in Information Systems module offered to 39 second-year students and 40 Development Studies students. Facebook and WhatsApp were the main platforms used for conducting online discussions and preparation to aid students in successfully completing their continuous assessments, group discussions, group presentation, and project supervision. The next section outlines key research questions underpinning this study followed by the research methodology.

**Key Research Questions (Q):**
Outlined below are the research questions guiding this study:
**Q1:** How are social media networks used among university students and educators for educational purposes?
**Q2:** What achievements have been made and challenges encountered by both students and educators in the use of SMN for educational purposes?
**Q3:** How are university policies on the use of ICT and internet promoting or discouraging the use of social media for educational purposes at the university?

**Methodology**

*Research Paradigm*
The study adopts a mixed method approach. This model employs rigorous quantitative research assessing the magnitude and frequency of constructs and rigorous qualitative research exploring the meaning and understanding of constructs; intentionally merging their strengths to frame the investigation within theoretical positions (Creswell et al. 2011). The study intentionally adopts a mixed method paradigm against the background that both quantitative and qualitative approaches possess strengths and weaknesses, and thus a mixed method approach is thorough since it complements the weaknesses of each approach.

*Research Design*
The study adopts a case study research design. A case study can be defined as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident…[and] relies on multiple sources of evidence" (Yin, 1994). The researchers use a single university as case study in order to gain an in-depth understanding of the use, achievements and challenges encountered in the process of adopting social media networks on the pedagogy of undergraduates teaching.

*Population and Sampling Procedures*
The target population for this study are undergraduate students doing their BIS and Development Studies degrees at the university. Purposive sampling is used to identify the population for the study. Purposive sampling technique is used as it is cheaper and likely to give richer insights of the study as compared to other sampling techniques. Research participants for the study were constituted of 39 BIS students (18 male and 21 female), 40 Development Studies (18 male and 22 female) undergraduate students and 6 lecturers (composed of 2 female and 4 male) involved in undergraduate teaching. All of the educators had more than three years of lecturing experience in their respective areas of speciality. Three educators had some experience in using SMN for learning, whilst the remaining three had never used it for academic purposes.  The ages for the students participating in this study ranged between 18 – 35 years. Overall, the study had 85 participants.

*Data Collection Instruments*
Data collection is the "accurate and systematic gathering of information relevant to the specific objectives and questions of a study" (Burns et al, 1999:43). The major data collection instruments used in this study was questionnaires and documentation analysis. Eighty-five questionnaires were distributed to the target population and 80 were returned, fully completed – constituting a 94% return rate. The researchers utilised previously published journal articles on the use of social media in teaching, learning and research project supervision since there were no archived documents on the university under study – hence the research is of its new kind. The study made use of Facebook since it was the widely used social networking sites by the participants.

*Rigour, validity, reliability and trustworthiness*
Rigour is a very crucial aspect of mixed method research and represents key research quality (Venkatesh et al. 2013). Wahyuni (2012) believes that quantitative research should rely heavily on reliability and validity to ensure its replicability and generalizability. Furthermore, it is essential for quantitative researchers to endeavour to "fragment and delimit phenomena into measurable or common categories that can be applied to all of the subjects or wider and similar situations" Winter (2000). Thus, the researchers incorporated these aspects to ensure the validity of the data gathering

instruments and reliability of the research results. The research study adopts four measures of research trustworthiness proposed by Guba et al (1989) for measuring the quality of a qualitative research study and these are credibility, transferability, dependability and confirmability. A qualitative research is considered to be trustworthy if "it accurately represents the experiences of the participants" (Rolfe, 2006).

### *Data Analysis*
Data analysis is the process of bringing order, structure and meaning to the mass of collected data for its interpretive and meaningful quality (Ramara, et al., 2010). Data collected using quantitative approach, predominantly from questionnaires and secondary data was analysed quantitatively using the Statistical Package for Social Sciences (SPSS), and triangulated with qualitative data. Secondary data was analysed based upon the research questions for the study (Long-Sutehall et al. 2010).

### Conceptual and theoretical framework
The study is underpinned by the connectivism theory (Seimens, 2004). The theory is relevant to this study because it has crucial principles of comprehending and exploring higher education learning dynamics in a networked platform. The theory acknowledges that social networking sites offer the opportunity for individual, groups and virtual peer members of educators and students to collaborate. Therefore the learners are exposed to all these three interaction modes to benefit in information exchange. The starting point in applying the connectivism theory is through allowing students to voluntarily join the online research community on the social networking sites. However, to attain the maximum benefits of harnessing social media on postgraduate research supervision, the supervisors should set-up the dos and don'ts and students must acknowledge their shortfalls and have a willingness to learn from the networked learning community.

### *Connectivism Theory and its Suitability to the Study*
Connectivism theory (Seimens, 2004) outlines a learning theory suitable for the digital age and a possible successor to the behaviourism, cognitivism and constructivism theories. Connectivism constitutes a valuable framework for the pedagogy of research supervision where control does not entirely rest on the educators, but increasingly give more autonomy to the students over their academic work (Donnelly, 2013).

Connectivism theory is relevant to this study because it outlines constructs required in internetworked collaborations and information exchange facilitated by the social media networks. Therefore the underlying key principles of the connectivism theory that are relevant to undergraduate collaborative learning and research supervision and inform this study are: that the process of learning is constituted by specialized interconnected nodes that share and disseminate information source of interest; the pedagogy of learning and knowledge is invested in acceptance of the diversity of group members' opinions; the intention of individual and group collaborative activities and process are to provide accurate and current knowledge to every member; to facilitate the process of learning and its continuity, nodes should foster and maintain established connection; and to acknowledge that for each node of the network, the process of decision making is a learning curve that should be tackled with open-mind for improvement (Siemens, 2004).

Therefore, the starting point for harnessing connectivism learning principles into undergraduate learning and research supervision process is when the learner joins the social media network and information is activated by both the educator and the learner into learning community for the benefit of both parties. It is very crucial to note that this learning community is bi-directional, both educators and students benefit as opposed to the tradition face-to-face educator-to-student information flow. According to Siemens (2004), a learning community is established by clusters of individuals sharing universal interests and permitting interactivity, dialoguing, data and views

sharing. The connectivist theory can be applied to undergraduate learning in three ways within the social networking cluster: one-on-one (educator-to-student) exchange, group discussions and virtual member support groups (Donnelly, 2013).

The one-on-one exchange (1-on-1) and; online group discussions and collaboration follow the designated institutional regulations that are traditionally done in face-to-face learning and consultations with students. At the one-on-one exchange, the student and educator utilizes online blogging for discussions, advice and mapping the way forward for academic work to be done. Social networking site utilities like online logbooks and retention of all conversions between group members for future reference provide invaluable benefit of flexible and asynchronous access to data.

Group discussions (G-D) occur when the students and their educators are all connected on the social media community. The students gets insights, feedback on group work, inspirational and moral support, and assistance from many educators who focus on similar subject and research area. The major benefit of group discussions and project supervision lies in diversity of feedback, critiquing and permitting students to develop skills for handling multiple feedbacks on their work.

Virtual member support groups (VM-S) involve only peer students interacting in the virtual social media networks exchanging and discussing learnt concepts in one-on-one exchange and group discussions and assist each other along the way. The most crucial rule governing virtual member support groups is that students must acknowledge that they do not know everything and their interaction and discussions with other social media community members lead to mastering of course content (Johns et al, 2011).This is very vital as it provides the much needed moral support, deeper understanding of otherwise difficult concepts and encouragement to soldier-on with the courses and research projects until completion.

Given this background to the connectivism learning theory and its capabilities, the study seeks to investigate its impact on undergraduate using social media. Sussex (2011) argues that the proper use of social media with its strength to return recorded conversions for future references and minimizing regular face-to-face educator-to-students learning, social media interactivity brings the richest and most flexible learning platform and project supervision in this digital era. Nevertheless, the connectivism theory is associated with numerous drawbacks: lack of self-directed learning, need for high level of critical analysis skills in order to sift the huge volumes of discussed issues and the need for self-autonomy over one's work – all these are crucial at undergraduate level where students require adequate guidance to succeed in their first year at university.

**Results Discussion**
The assessment of the use of social media network by undergraduate students and educators was done along the three research questions: how are social media networks used among university students and educators for educational purposes? What are achievements made so far and challenges encountered by both students and educators in the use of SMN for educational purposes? How are university policies on the use of ICT and internet promoting or discourage the use of social media for educational purposes at the university? Data was mainly analysed using quantitative approach. Eighty questionnaires out of eighty-five distributed were returned, fully completed. This represented a 94% response rate. Secondary data was analysed using content analysis.

**How SMN are used for educational purposes:**

Table 1 shows the general information about the composition of the participants (both educators and undergraduate students) for the study survey. The highest percentages of student participants (43%) were aged between 22-25 years old, followed by 34% of age range 18-21, then 13% of age range 26-29; and the 30 years and more age group constituted the least percentage of 4%. For educators, age distribution was not a great determining fact for the study.

**Table 1. General information about participants**

| Participant Category | Age | Gender | | Percentage (%) |
|---|---|---|---|---|
| | | Female (N) | Male (N) | |
| **Students** | 18-21 | 18 | 11 | 34 |
| | 22-25 | 21 | 15 | 43 |
| | 26-29 | 3 | 8 | 13 |
| | 30-more | 1 | 2 | 4 |
| **Educators** | 24-30 | 1 | 1 | 2 |
| | 31-40 | 1 | 1 | 2 |
| | 41-more | 0 | 2 | 2 |
| **Grand Total** | | 45 | 40 | 100% |

The empirical study found that more than 90% of the students under study use social media networks (mainly Facebook, WhatsApp and MySpace) for both social interaction with their colleagues and for educational purposes. Observing the utilization of different social media networks by students and educators, Figure 1 shows the highest percentages are achieved on the one-on-one usage type for both Facebook and WhatsApp. It imaged from the findings that WhatsApp scored the highest score of 45% amongst student users and 48% amongst educators. Such a huge score is attributed to the fact that most students use smartphones and preferred to use WhatsApp for simple communication purposes like texting critical notifications and updates on a specific module.

The ratio of academic activity on both Facebook and WhatsApp for virtual member support group collaboration decreased quite dramatically to 5% and 8% respectively. This is attributed to the fact that most educators are not engaged in virtual member support groups for students support and amongst themselves. Our findings in Figure 1 also confirm results in Kent (2013) that a huge percentage of academics are not using social media networks for academic purposes. Chief among the cited reasons for this is the huge investment in the amount of time and skills required to setup the learning environment on the SMN.

Another fascinating finding with regard to student participation and critical thinking, the study found that most of the shy students who does not participate in class contributed immensely and often valid ideas and solutions. In some way, the engagement of SMN for academic purposes encouraged introvert students to participate in group discussions.
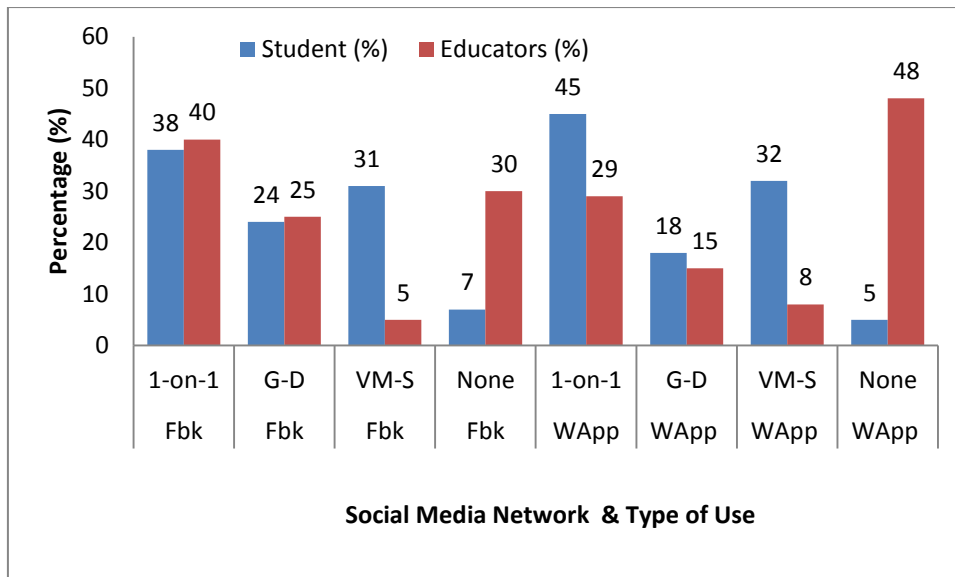
**Figure 1.** Percentage usage of different types of SMN for academic purposes

**Achievements and Challenges Encountered:**

With regard to achievements made in terms of key skills and competences gained by students as a result of engagement with SMN, findings showed positive gains. The highest percentage score of twenty nine percent of skills gained was on enhanced ICT and SMN. As noted in Kent (2013) such a huge percentage in SMN usage might be attributed to the fact that the majority of students have mobile devices integrated with Facebook and WhatsApp – hence were already familiar with the applications on social networking frontier. The majority of the participating students agreed that they have mastered new skills like group chat discussions and online blackboard notes tracking; over and above blogging. Furthermore, our findings voice that students gained more competencies like improved connectivity, pass rate, foster critical thinking and better pedagogy, with percentage scores around 15%. This is in-line with Zanamwe et al. (2013) studies on the use of SNM for academic purposes. Contrary to our findings on improved creativity and innovative skills by students, Buzzetto-More (2012) findings scored very high on this parameter.



**Figure 2:** Achievements made through the use of SMN

The study found out that some students are encountering huge challenges as a result of the use of SMN for educational purposes. Chief amongst the problems is that the catchment area for the majority of students enrolled at our university i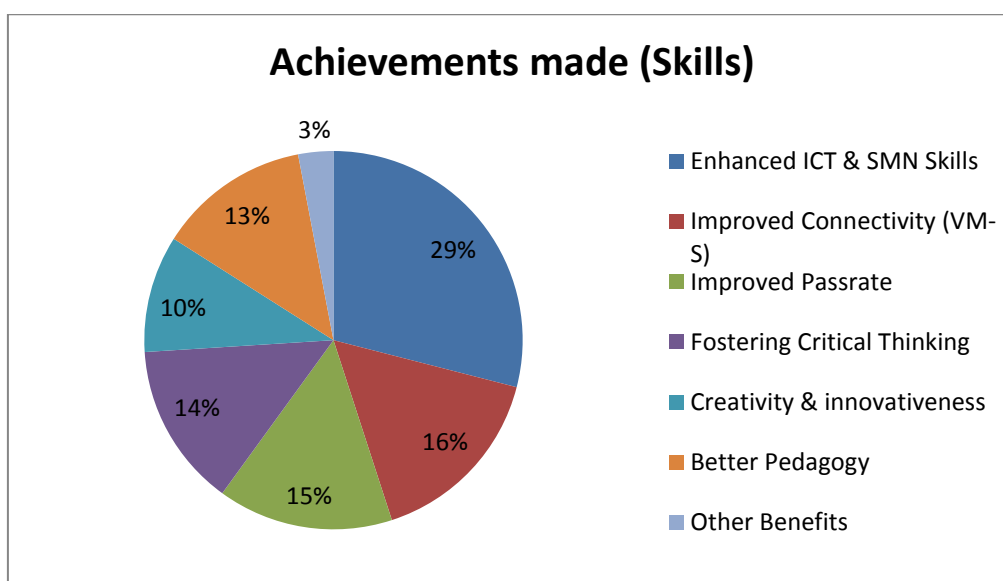s from the surrounding rural areas – hence the students are underprivileged both financially and in their prior exposure to ICTs and SMN before enrolling for undergraduate degree. This has a huge impact on their affordability of individual access to internet whilst off campus – thus restricting their engagement through SMN whilst on campus. Whilst many studies (bin Abdul-Rahman et at. 2013; Kent, 2013; Zanamwe et al. 2013) louds the overwhelming acceptance of SMN by students; our findings showed that most underprivileged students developed some resentment towards using SMN for educational purposes. Another notable challenge on the side of educators was on persuading students to engage in SMN forums for the courses – initially the majority of the students felt that educators were invading their social playground and take away their leisure time. Great motivation, time and skill had to be invested by educators to get the SMN pedagogy sailing smoothly.

**University policies on the use of ICT and SMN:**

The study found that there is no clear university policy in place with regard to the use of social media networks for both social and academic purposes and as such, lecturers are undertaking self-initiatives to improve their teaching to suite the ever changing taste of the twenty-first century 'socially-connected-students'. However, this is understandable since the ICT environment on emerging technologies like SMN is too dynamic for any university to cope up with constant changes. Our results findings on the non-existence of updated ICT policies on the integration of social media networks for academic purposes are in-line with Adesoji (2012) findings. Findings showed that most universities across the world, especially in developing countries have out-dated ICT policies that do not address the use of social media networks for educational purposes. Another major drawback is to do with slow implementation of policies on new ICTs, leading to huge leg time between policy formulation and practical implementation to benefit students (Wit & Heerwegh, 2012).

**Limitations of the Study**
This study had some limitations: One of the major limitations for this study was on limited access to institutional critical documents on policies and integration of ICTs into teaching and learning. Furthermore, the inclusion of a small sample for this study had adverse effect on ensuring generalizability aspect of the study and rigor. Often, rigor is attained with large sample sizes. Lack of funding also restricted the study to focusing on two modules with an average of 40 students. Researchers would have wanted to investigate the use of social media networks for mass-classes with around 500 to 1000 students and find out how the educators' approach works. This would be of great importance to educators across the world struggling to teach mass classes.

**Conclusion**
This research study was aimed at exploring the role played by social media networks in promoting active learning, collaboration and project supervision within the context of a rural South African university faced with numerous resource constraints on both the university and the students' sides. The study was underpinned by the Connectivism Theory of learning, seeking to understand the pedagogy and associated dynamics of networked undergraduate classes, utilising Facebook and WhatsApp social media platforms. The major goal of the study was to establish how social media networks are used among university students and educators for educational purposes, achievements made and challenges faced as a result of using SMN; and how university policies on the use of ICT and the internet are promoting or discourage the use of social media for educational purposes. Research findings indicated that Facebook and WhatsApp are the widely used SMN for educational purposes on one-on-one (educator-to-student) exchange, group discussions and virtual member support groups. Our study findings are in agreement with findings in Adesoji (2012) and Beqiri (2014)

that ICTs are now the modern means of improving teaching and learning, especially in institutions of higher learning. Educators should take a leading role in spearheading the use of social media for academic purposes by motivating students to use SMN. A mixed model research design was used in this study to investigate the opinions of 79 undergraduate students and 6 educators on the effects of social media for educational purposes. Thus, the study has answered all the three research questions.

The study conclude by suggesting some recommendations: firstly, given the modern trends in our university students of spending some considerable amount of their time on social media sites, educators in institutions of higher learning should become innovative and harness SMN into their formal teaching curriculum to promote active learning. However, caution should be taken when designing the learning platforms to ensure that positive results are achieved when engaging students.

Secondly, research findings revealed that undergraduate educators and project supervisors can increase the capacity to teach more students if they engage on blended online learning and project supervision utilizing social media as opposed to entirely rely on using face-to-face class teaching. Thus, the study recommends institutions of higher learning to harness emerging social media networks into their formal learning environment. The benefits far outweigh the drawbacks if the SMNs are properly integrated into the pedagogy.

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# TEACHING AND LEARNING THROUGH THE USE OF ICT AMONG STUDENTS WITH SPECIAL EDUCATION NEEDS

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## Abstract

The use of information and communication technology (ICT) by persons with special needs has been advocated for over the years. The United Nations Convention on rights of persons with disabilities also stipulated the rights of persons with disabilities to accessible information. The aim of this study is to provide a picture of how ICT is currently used in a typical special primary school in Ibadan, Oyo State, Nigeria. A research question was generated for this study. The descriptive research design was adopted. Ten teachers of students with special needs and five students with special needs responded to a ten item questionnaire used to interview the participants on the access and utilization of ICT in teaching and learning process. The findings of the study revealed that teachers of students with special needs have been trained in the use of ICT especially the computer but most of them still find it difficult to utilize it in the teaching and learning process due to lack of adequate computers in schools and the cost of purchasing personal ones. The students with special needs have been trained by a non-governmental organization on the utilization of ICT but they lack access. This has affected their ability to recall what they have learnt and utilization of computer devices. The researchers recommended the re training of teachers and students with special needs. It is also pertinent that major stakeholders should provide necessary ICT gadgets that will enhance teaching and learning among students with special needs.

## Introduction

The World Health Organisation states that 15% of the world population is with disabilities. Information and communication technologies (ICT) have potential for making significant improvement in the lives of persons with special needs, allowing them to enhance their social and economic integration in communities by enlarging the scope of activities available to them. Persons with disabilities in developing countries face particular difficulties in accessing the most basic forms of education. They face the lowest levels of access to education of any cohort of students. Of the 75 million children of primary school age worldwide who are out of school, one third are children with special needs (WHO, 2011). ICT and in particular assistive technologies (ATs) can provide students with special needs access to traditionally inaccessible educational content through electronic and online channels.

For years different modes of technologies have been used to improve the quality of life of individuals with special needs, however the rapid advances in assistive technology research have come quite far from the humble hearing aid or walking cane. Today sophisticated technology can help persons with special needs to communicate, carry out day to day tasks, control their environment, work and live more independently. With more than 1 billion

people in the world living with some form of disabilities according to World Health Organisation the impact that AT can have is huge (Nanda, 2014).

With the advent of ICT new hopes are emerging for persons with special needs. Despite the huge challenges, sincere efforts are being undertaken to implement the use of ICT to counter obstacles related to disability. The information society represents at once significant opportunities but also potential new barriers for the social inclusion of persons with special needs. ICT and AT offer new opportunities for everyone especially persons with disabilities.

## Theoretical Framework

## Information and Communication Technologies

ICT stands for information and communication technologies and are defined as set of technological tools and resources used to communicate and to create, disseminate, store and manage information. These technologies include computers, the internet, broadcasting technologies (radio and television) and telephony. Electronic technologies include computers, cell phone, internet and electronic organisers which hold great promise for individuals with disabilities (Dada & Oni 2012).

## Challenges with ICT with persons with special needs

Age, work setting and self-perceived ability to manually copy information affected the likelihood of use of ICT tools by persons with special needs. Primary barriers reported by participants included lack of access, training and support and expense of technologies in a study conducted by Dada and Oni (2012) on the usability of electronic technologies by persons with disabilities.

In concrete terms, barriers to standard electronics and information technology limit opportunities to education and employment for some people with disabilities. This includes telecommunications equipment and services. This is unfair in a world powered by information and communications technology. Telecommunications products have become essential tools in education, employment, and recreation. Today, almost all able-bodied Nigerians use telecommunications products for routine daily activities. The United Nations Convention and Rights of persons with disabilities is unequivocal on the needs to ease access to telecom services to people with disabilities. Since Nigerian Communications Commission (NCC) has committed itself to this convention by acclamation, it needs to regulate how service providers develop and implement inclusive business policies which take cognizance of the accessibility needs of persons with disabilities. Telecom operators ought to use some of its products like recharge cards to make disability advocacy tools, as well as provide free voice activated menu (Nigeria Tribune, 2013).

Article 9 of the Convention on Rights of Persons with Disabilities (CRPD) defines ICT accessibility as an integral part of accessibility rights on par with transportation and physical environment for Persons with Disabilities (PWDs). There are indeed so many challenges for PWDs to realize their fundamental Human Right of access to information especially in the developing world. These challenges include but are not limited to; Low education levels of PWDs especially in the developing countries, absence of assistive technologies to help even the educated PWDs, the absence of clear intervention strategies by governments, local disability leadership and other stakeholders to save the situation, the fact that majority PWDs live in the most rural parts of Africa and therefore cannot be covered by the available ICTs (Agena & Devito, 2010).

Research on ICT and disability is typically focused on specialized or adapted technologies designed for use by people with special needs. More and more, however specialized technologies are entering mainstream markets and generic technologies are being used by people with special needs to enhance their quality of life. The increasing usability of generic technology may lead to important benefits for persons with special needs; products designed for mass markets tend to be easily available, less expensive and less stigmatizing than specialized technology (Hart, O'Neil-Pirozzi & Morita, 2003).

**Types of Information and Communication Technology in Special Education**

ICT in special education can be broadly divided into three (3) types namely: audio, visual and audio-visual technologies. Audio-ICT refers to ICT gadgets that are only heard but not necessarily seen. They can be used to instruct disabled children through their sense of learning. Example includes audio tapes, special switches, hearing aids, ear molds, audio books and so on. Visual-ICT are technologies that provide visual access to communication and can be used to give instruction. These include video relay systems, video remote interpreting, closed circuit television, closed captioning and so on. Audio-Visual ICT refers to technologies that provide both audio and visual access to communication for disabled persons. These include, video phone (VP), video conference, televisions, and so on.

The video-relay systems allow a person who uses sign to communicate through an online interpreter to a person who uses spoken language, or a person who does not sign to communicate
with a signer. This system facilitates more contact between the teacher and the learner. Video Remote uses video cameras to provide sign language interpreting services. The people are in the same room and look at the computer screen for interpreting and hear the interpreter speaks. There are many possible ways of using it such as in the classrooms, at interview sites or work-study programmes, and during individualized educational programmes (IEP) team meetings.

The video-conference allows two individuals who sign in to communicate directly. Children can
take classes from geographically distant places. Itinerant staff can provide support to a child from a distance. Videoconference may also be of value in rural areas to ensure children have regular access to adult role models who use sign to provide opportunities for peers to talk with each other and take classes together. It could be used in teaching sign language, to children and adults. As videoconference becomes widely accepted, the communication need of persons should be considered as well. Video streaming such as like Signing Avatars, though not widely available, is an emerging technology which uses three-dimensional characters to communicate in
sign language and use facial expressions. Many companies have used animation technologies to develop signing avatars, or cartoon characters that allow the characters to communicate in sign language. Not only does this technology have the potential for teaching literacy to young deaf children, it can be used as well to teach sign language to parents, staff, and other children. Video streaming also allows the use of video logs in which individuals can set up a visual log. Video logs provide visual commentary or news on a particular subject that involved more persons.

Videophone (VP) uses the same technology as videoconference. It takes advantage of link technology to allow people to make telephone calls through the internet and see each other. Itinerant staff can provide support to a child from a distance. Videophone may also be of value in rural areas for the mainstreamed child who needs specialized instructional techniques designed for deaf education.

The closed captioning is assistive technology designed to provide access to television for persons with hearing disabilities by displaying the audio portion on a television signal as text on the television screen. Currently, most television sets have a chip imbedded in the set to allow for the text to appear on the television set screen. This is also available on DVD; video tapes, and compact disks of commercially-made movies and programmes.

The Real Time Captioning (RTC) is a method (which parallels the work of court reporters) where a specially trained capturer uses a machine that is connected to a computer with software capable of translating graphic shorthand into words in caption formats and standard spellings, writes the spoken word on the steno machine (Nanjwan & David, 2013). The computer software instantly translates the stenoentries into readable English text on the computer at a near verbatim rate. It is commonly used for newscasts, lectures, presentations, meetings, and sporting events, but can be used for classroom instruction.

The Communication Access Real-Time Translation (CART) involves a trained stenographer encoding spoken English that is converted to English text and displayed on a computer screen or television monitor, CART is used in some classrooms, courtrooms, and professional conferences (Nanjwan & David, 2013).

**Uses of ICT in Special Education**
Interaction between special education and ICT has help person with special learning needs to survive and reexamine issues practice for their mutual benefit. The use of ICT to support teaching and learning is well established in current practice (Adams & Papa, 2004). Since the origins of school-based computers, they have been used to support the education of pupils with special educational needs. ICT can make a significant difference to the life and learning of children with learning difficulties. Ozoji (1993) identified five main ways in which ICT can be used to meet the special educational needs of pupils such as:
(a)Assistive ICT is an ICT device, resource or service which aids the individual to improve or enhance any skills that hinder his/her functional ability (e.g. switch technologies). (b) Augmentative ICT: it is an ICT device that aids the individual to do something that they could not otherwise do, for example, speech and communicator devices. In essence assistive and augmentative ICT is about enhancing an individual's interaction with their environment and is most likely to be applied to physical and sensory disabilities. (c) Remedial ICT is an ICT device, resource or service that provides support to an individual for a specific cognitive or behavioural need. (d) Integrated Learning Systems (ILS). It delivers individualized learning in mathematics, reading, writing and spelling. Each student has a learning programme continuously tailored to personal needs; all students progress at their own level and pace and are free to achieve within the security of their own private learning space. Learners, teachers and mentors are supported throughout the process by diagnosis of achievement and difficulty, delivered through continuously differentiated learning resources and clear detailed reporting. (e) Diagnostic ICT: is an ICT device, resource or service that provides information to teachers that facilitates the identification of a special educational need and possibly suggests remedial courses of action, which includes ICT tools and other resources or the materials. The teacher of ICT is therefore in a key position to work with ICT

professionals in removing some of the barriers to learning that exist in mainstream classrooms For example, they will have expertise in the use of control and switch technologies which may enable access and improve communication for those with motor impairment; they will be able to adjust hardware and modify software to accommodate those with poor sight or hearing difficulties; they could set up independent learning programmes for children with emotional/behavioral disorders who may relate better to work on a computer than when directed by a teacher. Computers often seem to provide a preferred learning medium for children who are diagnosed with an autistic spectrum condition.

## Statement of the Problem

Although, the teachers are aware of the improvement which ICT has brought into the teaching and learning process of persons with special needs but a lot of gap needs to be filled.. Information service delivery to the students with special needs has been recognized as the driving force and primary gadgets for almost all progressive initiative that rely on knowledge based and skills oriented development activities in all spheres of human endeavour's. It thus becomes imperative that students with special needs should not be left out of these great opportunities. This equal access for individuals to partake in ICT training and the use of ICT for information processing should be made intensive irrespective of physical status. In the era of globalization therefore, there is urgent need for advanced countries to assist by financing the manufacturing companies to enable them produce adoptive/assistive technology. Therefore, it is very imperative that students with special needs nurse personal overt and covert problem that need both ICT training and guidance counseling services that would enhance their skills for attaining high academic performance with their able-bodies hence this study.

## Research Question

How is ICT accessed and utilized by teachers of students with disabilities and students with disabilities?

## Method

Qualitative methods were appropriate to this investigation as it produced detailed data from a small group of participants. The interview is recognized as a vital instrument in the gathering of data for the qualitative researcher. The interview allows the participants to express their opinions and perceptions in their own words (Savin-Badin & Major, 2013). Semi-structured interviews were chosen in the context of this study as it afforded some flexibility to both the researchers and the interviewee. Though the interview guide lent a degree of structure and organization to the process, the approach was still very unrestricted. An audio tape recorder was used to record interviews. A tape recorded interview allowed for more accuracy in data collection and allowed the researcher to be more attentive to the respondents. Each tape-recorded interview was transcribed verbatim to ensure a greater degree of accuracy during analysis. The data was read multiple times, in order to analyze and find constructs, themes and emerging patterns.

**Participants and Data Collection**

The purpose of the study was to provide a picture of how ICT is currently being accessed and used in the teaching and learning process in a typical special school in Ibadan Metropolis in Oyo State of Nigeria. The participants for this study were to be drawn from teachers working in a state special primary schools and their students. A sampling frame was constructed by obtaining a list of special schools in Ibadan metropolis. This number was obtained through the ministry of education departments, using the department of education website. There are fifteen (15) state special schools in Oyo State. Due to privacy and confidentiality regulations, it is difficult to obtain names and numbers of teachers at individual schools. Only one of these schools was purposively selected based on proximity and the recent training in ICT that the students with special needs recently received. The permission of the head teacher of the school was sought and the consent of the teachers and students with special needs was sought. The participants were ten (10) teachers and five (5) students with special needs.

**Results and Discussion**

The 15 participants for the interviews were 10 teachers of persons with special needs and five students with special needs. Majority of the respondents are female. Their ages ranged from 15 to 48. Four of the respondents had undergraduate teachers' qualifications, while six had undertaken postgraduate studies in education. Each of the teachers indicated that they had previous experience teaching students with disabilities and typical students in their classes. All participants indicated average to high levels of confidence in their ability to teach students with disabilities; since they have certificates in special needs education. The students are living with disabilities. The results following should be interpreted with caution as they are based on a small number of respondents, the results therefore cannot be extrapolated to other groups unless they share similar demographics.

A ten item questionnaire was used during the scheduled interview session to elicit responses from the respondents. Reponses to each item will be discussed below.

ICT tools were simply defined as the use of computer. Some of the teachers defined ICT as the use of handsets, hearing aids, white cane and wheel chairs. This is in line with the assertions of Nanda (2014) that for years different modes of technologies have been used to improve the quality of life of individuals with special needs, however the rapid advances in assistive technology research have come quite far from the humble hearing aid or walking cane.

Most of the teachers responded that they do not make use of ICT tools in their teaching and learning process for students with special needs. Teachers and students perceived the use of ICT tools in enhancing teaching and learning as an herculean task. The use of ICT in enhancing teaching and learning is not famous in the school and highly challenging. Some of the teachers admitted that the ICT tool which they are familiar with is the computer but they do not make use of it in their school although the computers are available but under key and lock in the school office.

It was also stated by the respondents that they do not make use of ICT in their classrooms. The researchers further discovered that though most of the teachers admitted that ICT is computer and they have gone for training but they do not know the application of the

computer to their teaching profession. Some of the teachers revealed that they can booth the computer and type a little.

In order to know if the students with special needs have being taught the use of ICT the researchers asked further questions. The teachers have taught the students with special needs theoretically the use of computer but they have not taught them the practical use of computers. However, last year a non-governmental agency trained some of the students in the use and application of computer. The students with disabilities were highly excited to attend the training and they participated fully during the training. The students with special needs were highly fulfilled and want more of such trainings. After the training, few of the students were able to make use of handsets while majority do not have access to the use of computer gadgets.

Both the students and their teachers believe that the use of ICT could enhance teaching and learning. Among the benefits mentioned by the respondents are greater efficiency throughout the school, communication channels are increased through email, discussion groups and the regular use of ICT across different curriculum subjects can have a beneficial motivational influence on students' learning. It is also believed that students are generally more eager to learn and express more positive feelings when they use computers than when they are given other tasks to do. Computer use during lessons motivated students to continue using learning outside school hours. The students, who used educational technology in school felt more successful in school, were more motivated to learn and have increased self-confidence and self-esteem. The students found learning in a technology-enhanced setting more stimulating and student-centred than in a traditional classroom.

Respondents were also strong in their expression of a need for more information, knowledge and expertise in their attempts to use ICT in the teaching and learning process. All the teachers interviewed had received no formal training with regard to the use of ICT in the education of students with special needs. Furthermore, the experienced teachers hoped that their years of service would assist them in being able to cater for the various needs of the classes they were presented with especially if they can effectively use ICT in their teaching students with special. They were all willingly and eager to learn more on the use and application of ICT. Most of them also noted that it will be nice to actually have some knowledge of it, because they were not officially trained. They know very little of the importance or ICT in the education of students with special needs hence they were ready for intensive in-service training. Professional development was regarded as a bonus, though it was pointed out that not all schools had access to in-servicing of teaching personnel. While professional development did appear to hone in on certain areas of need, one experienced teacher voiced the view that such moves were often futile because they lacked the practical, grass-roots application that many teachers urgently need, as they attempt to be more technologically inclined.

## Recommendations

This study in line with the recommendations of Epps &Tindai (2007) suggested that ICT in special education can be given to learners with special learning needs at an early age with the appropriate learning equipment and there should be ICT training for all special education teachers to be highly qualified to do their jobs well. The government should improve on the electric power supply of the country because without regular power supply the use of ICT in

the teaching and learning process could be hampered. Government should train and recruit more ICT experts in the country. Government should make provision for supplementary aids and services to help learner to the maximum extent appropriate to their learning needs. Parents should be assured that their children receive some benefits in school through the use of ICT. This will encourage effective parental participation. Measurable steps to recruit, hire, train and retrain teachers should be emphasized. Teachers should endeavour to take into consideration individual differences when using ICT in special education. ICT should be included in the education of persons with special needs considering their strengths, preferences and interests. This can develop their skills appropriately. There should be campaign that emphasizes more understanding of ICT to learners with special needs. There should be census for learners with special needs for provision of adequate ICT equipment.

**Conclusion**

The process of given orientation through ICT focused on improving academic achievement of learners with special needs. One of the crucial debates within the ICT research and development arena at present is the application of inclusive devices Adams & Papa, (2004). Design principles that are the diverse range of users' needs are considered at the outset of designing hardware or software; their needs are not considered later and met as some form of adaptation to the already existing product. In order to build a truly inclusive information society, educational approaches and appropriate technology must be developed that meet the requirements of all users with special learning needs, including those who have special educational needs. Access to appropriate ICT can reduce inequalities in education and ICT can be a powerful tool in supporting educational inclusion. However, inappropriate or limited access to ICT can be seen to reinforce inequalities in education faced by learners with special educational needs. The digital devices that could potentially develop within countries' educational systems can be particularly significantly within the special education sector to facilitate knowledge for person with special learning needs.

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# EFFECT OF JIGSAW COOPERATIVE LEARNING TEACHING STYLE ON STUDENTS` ACHIEVEMENT IN ORGANIC CHEMISTRY

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**Abstract**

The purpose of this research was to investigate the effect of cooperative learning on achievements of first year chemistry students' learning outcomes in organic chemistry at Haramaya University. 105 students (14 females and 91 males) participated in the study. The study made use of a Static group control design having 51 students in the Intervention group and 54 students in the control group based on their sessions. All the students in both the treatment and control groups were exposed to the same study unit that covered during organic chemistry I. For the former group the contents of the unit were treated with cooperative learning approach, while for the later, the same unit was treated using the traditional lecture method. To measure differences between Intervention and control group, identical pre-test, quiz, assignment, and post-test evaluations were administered. The results obtained indicated that, statistically significant difference was observed between Intervention and control groups with the two sample t-tests at $p < 0.05$ taken on the quiz and post-test achievement scores of students. The Intervention group students were found to have performed better than those in the control group. The responses to the questionnaires gathered from the Intervention group indicated that cooperative learning was effective in acquiring deeper understanding of Chemistry concepts as they worked together in their groups. This is also supported by Intervention group students' positive attitude as observed on some interviews made regarding the effectiveness of cooperative learning experiences in organic chemistry class.

**Keywords**: cooperative learning, lecture method, functional groups, Jigsaw Cooperative Learning, Organic Chemistry, stereochemistry and hybridization.

## Introduction

Organic Chemistry is one major course offered to chemistry department students and as a supportive course for other natural science department students in most Ethiopian Universities. However, our teaching experience in chemistry department at Haramaya University and some other studies revealed that Organic Chemistry course is considered a difficult subject from students' point of view and their performance in this subject is relatively low. According to Gabel (1999), Chemistry is considered as a difficult subject is because, the abstract and highly conceptual nature of science seems to be particularly difficult for students, since teaching methods and techniques do not seem to make the learning process sufficiently easy for students.

An important objective in teaching science in higher education is to enable students to acquire knowledge in order to comprehend the nature of the world. In contemporary perspectives on education, knowledge cannot automatically be transmitted from one person to the others (Herron, 1996). Knowledge is constructed in the mind of the student based on existing knowledge and understanding. However, most course materials in science education have typically been "taught" by the lecture method (Cooper, 1995). In lecture method, students go to class, listen and take notes on the lecture of the instructor. Lecture method has been considered to be an efficient method to present the fundamentals of science, to emphasize the key concepts and to model problem solving skills within a limited time. However, the method has many weaknesses in terms of the learning processes. It makes students to passively receive information from teachers; while they pay little

attention to the processes of constructing knowledge and developing their cognitive abilities of students (Tesfaye, 2007).

Novak (1998) accentuated the need for educators to take advantage of the available knowledge base of learning, learners' knowledge construction, and instructional tools to improve educational quality, and a knowledge base that has not been sufficiently tapped. Improving educational quality requires designing strategies which can be used to improve the teaching-learning of chemistry, and to make it more attractive to students, requires at least, placing learners in active rather than passive roles (Moore, 2005).

As improving the problem of teaching/learning process preoccupies educators, literature suggested that cooperative learning could to be useful in enhancing meaningful learning. Cooperative learning is an approach to group work that minimizes the occurrence of those unpleasant situations and maximizes the learning and satisfaction that result from working on a high-performance team. A large and rapidly growing body of research confirms the effectiveness of cooperative learning in higher education (Johnson, et al; 2000).

We have observed that many students work hard with course materials in Organic chemistry in the Chemistry department of Haramaya University, yet their examinations results reveal that a large proportion of the students cannot clearly and logically express their answers. They seem to work hard, but do not acquire the necessary knowledge. Our interest has been to facilitate students' learning, to make them actively engage in constructing their own knowledge, and to help them develop their abilities in reasoning and logical thinking. This is in agreement with Le Thi So Nhu, (1996) that "the only significant change that is required is a change in teaching methodology". Even though students expected to develop abilities of reasoning, logical thinking, and working independently, they are still generally taught using the lecture method and hence there is no significant change observed in the students. Teachers should endeavor to change their teaching methods, because "... teaching of higher level reasoning and critical thinking does not depend on *what* is taught but rather, on ***how*** it is taught" (Le Thi So Nhu, 1996).

A number of researches provide empirical evidence that cooperative learning is a useful learning strategy in many content areas such as mathematics, Physics, and Physical Chemistry in developed countries. However, no systematic study could be located in Ethiopian higher education level to evaluate the effect of cooperative learning in Organic chemistry of undergraduate course. The problem of this study was to investigate the effect of jigsaw cooperative learning style on the students' achievements and attitudes in Organic Chemistry (functional groups, stereochemistry and hybridization) with Haramaya University undergraduate students as a case study.

**Hypotheses of the Study**
Two major hypotheses that guided the study are:
1. There is no significant different in achievement scores between Organic Chemistry students taught with cooperative learning approach and those taught by the usual (lecture) method (P ‹ 0.05).
2. There is no significant attitudinal difference towards Organic Chemistry between the two groups of the study.

**Theoretical Framework of the Study**
This study was based on three theories: Constructivist Learning Theory, Group Dynamics Theory and the Developmental Theory. The views of Piaget concerning active construction, structuring knowledge and stages of development; B. F. Skinner`s argument from an operant conditioning

perspective that students must actively respond if they are to learn; Vigotsky and others were considered for the Constructivist Learning Theory otherwise known as *Exploratorium.* This theory recognizes learning as an active process, a social activity and motivation seeking among other characteristics. The aspect of Developmental Theory considered most appropriate for this study is the Psychosocial Development theory of Eric H. Erikson which portrays the development of the person within a social context with particular reference to Erikson`s 6th (Intimacy versus isolation) stage of development. This is the early adulthood period characterized by the ability to reach out and connect with others and be intimate with someone with a view to work toward a career and by the assumptions of the present researchers, the undergraduates used for this study fell within Erikson`s 6th developmental stage.

## Methodology
### Sampling Procedure and Sample
The sample for this study was determined based on the number of students enrolled in the chemistry department for 2011/12 and 2012/2013 academic years. The sample size was 105 students (51 Intervention students in the 2012/2013 session and 54 control group from 2011/2012 session. The Intervention group was further divided into cooperative nine groups by the researchers by according to the students` sitting arrangement in the class. Six of the nine groups had six members each while the other three groups had five members each. In every group, one student was assigned the leader, one as the secretary and the rest were as reflectors.

A Quasi Intervention Static group Control design was adopted, using both quantitative and qualitative (Mixed method Approach) was adopted the study. Specifically, Static-Group Comparison or Comparison Group Posttest-Only Design was preferably used as represented below:

Intervention Group   X   $O_1$
Comparison Group        $O_1$

Where X means treatment and $O_1$ is post-test.

### The Intervention Design
During this study, the *cooperative learning approach* was utilized for the Intervention group as a teaching-learning tool. There was no such special treatment provided for the control group in the previous year and the teaching-learning approach was with the usual traditional lecture method. The same Organic Chemistry topics prescribed for the Intervention groups were taught to the control group by the same lecturer and the students in the two groups were admitted and registered using the same criteria thereby keeping the level of content and scope of coverage similar to both groups.

### The group design in cooperative learning environment
A combination of peer-led-team learning and jigsaw with mini lecture was used in the Intervention group. These structures promote both individual and group thinking and reflection on issues, questions, or problem-solving among group members. From each group one member was assigned as the leader/manager to manage the group and ensure that members fulfilled their roles and worked cooperatively in a timely manner; another as a recorder to record the group's answers and discussion outcomes; and the rest members as the reflectors to ensure that all possibilities have been explored by posing questions such as *What's another idea?* or *How can we look at this problem in another way?*

To ensure proper and meaningful application of the research teaching strategy from the beginning, the first week was used to introduce cooperative learning approach to Intervention group students to minimize difficulties toward the method. Ai Bin (2009), states that for cooperative strategies to

work, careful planning, discreet observations and evaluation and preplanned adjustments (alternative activities) are essential to help students move consistently forward. The Intervention group students were then trained on cooperative learning approach based on Johnson & Johnson, (1998) model; cooperative learning is instruction that involves students working in teams to accomplish a common goal, under conditions that include the following elements:

  i. Positive interdependence
  ii. Face-to-face interaction leading to promotion of learning
  iii. Individual accountability (Personal responsibility)
  iv. Interpersonal and small-group skills (Teamwork skills)
  v. Group processing

McIntire, (n d) explained that producing a true cooperative learning experience requires the following additional criteria in both planning and execution:

  (a) "Division of labor among students in the group
  (b) Assignment of specific roles and duties to the members
  (d) Collective handling of learning assignments
  (e) The development of social skills as a result of cooperative interaction
  (f) Provision of group rewards by the teacher."

The Intervention group students were encouraged to meet with their group members for two hours twice a week on the quiz and assignments based for their group activities on Organic Chemistry lessons covered in the class. To maintain uniformity and to avoid some undue time advantage, to any set of participants in the study, the teaching time of two months and Organic Chemistry contents for both groups were the same. At the end of the treatment period the same post-test was administered to the two groups of students (appendix).

### Data Gathering Instruments

The relevant data from the subjects of the study were collected using multiple instruments described below:

### Chemistry achievement assignment

A Students' Organic Chemistry Achievement Test (SOCAT) was constructed by the researchers and gave the test out to three other Organic Chemistry University expert lecturers for content validation. The reliability of the instrument was found to have a coefficient of 0.81 as calculated with Kuder-Richardson formula 20 (K-R 20). The test contained 24 items on functional groups, stereochemistry and hybridization which formed the research curriculum of this study.

### Jigsaw Cooperative Learning Application Questionnaire (JCLAQ)

A second instrument used for data collection for this study was the Jigsaw Cooperative Learning Application Questionnaire (JCLAQ). It comprised of open ended and closed ended items aimed at determining the overall experiences of both the students and the researchers on whether or not the method improved achievement in organic chemistry and their generally opinions about the method. The essence of this was to evaluate the effectiveness of the strategy in the teaching-learning of organic Chemistry at the University level. The instrument with a check list enabled the researchers to examine the cooperative learning approach in assisting students in a class and judged the interaction levels among the students in actual classroom situation.

### Interview schedule

Interview schedule was used as data collecting instruments to get the views and opinions of students in addition to questionnaires about: the effectiveness of cooperative learning as a teaching-learning tool, to what extent the method enhanced students' comprehension of organic Chemistry

concepts and its appropriateness in group working. Three students from the Intervention group were randomly selected and interviewed in this regard.

**Methods of Data Analysis**

The data were analyzed using both quantitative and qualitative analysis methods. The quantitative data were analyzed using both descriptive and inferential statistics to describe the data in terms of the mean, and percentage. From inferential statistics, the t-test was used to test if there was any statistically significant difference between the Intervention and control groups.

**Result and discussion**

**Comparission between intervention and control group students on assignment**

### Table 1: Comparison between Intervention and control group students on assignment by using a two sample t-test

| First year chemistry students | N | Mean | Variance | t-value | p-value |
|---|---|---|---|---|---|
| Intervention group | 51 | 8.35294 | 0.91294 | -1.7681 | 0.08 |
| Control group | 54 | 8 | 1.16981 | | |

At the 0.05 level, the two means are NOT significantly different.

Table 4.1 above shows the comparison analysis of a two sample t-test that was performed between the two groups of students on assignment and the result indicates that there is no significant different observed statistically and their results were similar with each other. This is might be they were copied from each other or work together the assignment given to them as home work.

**Comparission between Intervention and control group students on Quiz**

### Table 2: The comparison results of intervention and control group students on quiz using a two sample t-test.

| First year chemistry students | N | Mean | Variance | t-value | p-value |
|---|---|---|---|---|---|
| Intervention group | 51 | 4.17647 | 0.55824 | -8.97554 | 1.3953E-14 |
| Control group | 54 | 2.40741 | 1.45353 | | |

At the $p < 0.05$ level, the two means are significantly different. The intervention group students with higher mean of 4.17647 indeed had improved individual achievement scores on quiz activities compared to the control group students whose mean score is just about that of the intervention group students.

**The post-test results**

Table 3: The two sample t-test results on post-test for Intervention and control group

| First year | N | Mean | Variance | t-value | p-value |
|---|---|---|---|---|---|

| First year chemistry students | N | Mean | Variance | t-value | p-value |
|---|---|---|---|---|---|
| Intervention group | 51 | 28.12745 | 33.12843 | -3.10437 | 0.00246 |
| Control group | 54 | 24.74074 | 29.41265 | | |

N=number of Intervention and control group students, P= probability.

The above table further shows the efficacy of the intervention teaching approach. It shows a significant mean difference in favour of the intervention group students leading to not accepting the null hypothesis originally stated for the study.

**Comparision of Intervention and control group Students' performance on subjective questions (on explanation written exam)**

Table 4: The two sample t-test comparative results of Intervention and control group students on subjective questions (on explanation written exam) of post-test

| First year chemistry students | N | Mean | Variance | t-value | p-value |
|---|---|---|---|---|---|
| Intervention group | 51 | 11.16667 | 8.35667 | -3.43706 | 8.4944E-4 |
| Control group | 54 | 9.26667 | 7.69283 | | |

At the 0.05 level, the two means are significantly different.

**Comparision of Intervention and control group Students' achievement on multiple choice questions**

**Table 5:** Comparative of Intervention and control group students on multiple choice questions of post-test by using a two sample t-test

| First year chemistry students | N | Mean | Variance | t-value | p-value |
|---|---|---|---|---|---|
| Intervention group | 51 | 16.92157 | 11.27373 | -2.27487 | 0.02499 |
| Control group | 54 | 15.44444 | 10.85535 | | |

At the 0.05 level, the two means are significantly different in the above table.
A critcal follow-up if  table 3, table 4, and table 5 above demonstrates there are convincing significant differences observed between the two groups of students ($p < 0.05$) on the quiz, post-test, subjective questions, and the multiple choice questions. These results revealed that the Intervention groups scored better achievement than the control group students. It further proved the effectiveness of jigsaw cooperative learning in enhancing students' achievement than traditional lecture method.
Based on the above findings, the researchers tend to agree with Emily Lin, (2006) who stated that the cooperative learning model was ranked first in teaching approaches that promote greater higher-order thinking, problem solving, and achievement.

**Survey of students' opinions about cooperative learning experience**
A conveniently modified 3 – level Likert scale was used to evaluate participants` opinions on the intervention approach employed in the study. An average score above three (strongly agree and agree) was taken as a positive opinion and any average score below three (strongly disagree and disagree) was taken as a negative response which opposed the idea stated in the questionnaire. While the third middle level of three was considered as neither positive nor negative, but as an

undecided response. The table below speaks to the summary of the participants` views about cooperative learning style as a strategy for teaching organic chemistry based on their experiences from this study.

**Table 6:** The students' response to questions related to cooperative learning experience

| No | statements | % of respondents | | |
|---|---|---|---|---|
| | | Positive | Undecided | Negative |
| 1 | The groups were structured by represented multiple students | 96 | 2 | 2 |
| 2 | All of the members of my group were committed to the success of the group | 90 | 2 | 8 |
| 3 | I felt responsible for the success of each individual in the group | 94 | 6 | 0 |
| 4 | My group had sufficient time to complete the activities | 88 | 4 | 8 |
| 5 | The cooperative learning approach forced me to take on more responsibility for learning organic chemistry. | 92 | 6 | 2 |
| 6 | The cooperative learning experiences in my class enhanced my learning | 96 | 4 | 0 |
| 7 | I listen to, and respect, the others' ideas and resolve conflicts in a positive manner during cooperative learning | 98 | 2 | 0 |
| 8 | I share the load of my group in seeking solutions and in making suggestions in organic chemistry class | 94 | 2 | 4 |
| 9 | I share my information, and take into account information from others | 98 | 0 | 2 |
| 10 | I contribute towards making each member of my group to do his/her set piece of work | 96 | 0 | 4 |
| 11 | I am happy about the success of my group in organic chemistry assignment | 100 | 0 | 0 |
| 12 | I get more work done when I work with others. | 100 | 0 | 0 |
| 13 | I learn organic chemistry more when I studied with a group | 100 | 0 | 0 |
| 14 | cooperative learning helped me to develop social skills with my group member | 96 | 4 | 0 |

As can be seen from table 6 above, it is seemingly obvious that the participants have positive opinions about the organization of the groups, the roles of the students in their groups, their contribution towards the success of the groups, the approach in enhancing their achievement. They further demonstrated positive opinions towards the effectiveness of the cooperative learning approach comparative to individual work, contribution of the approach in enhancing comprehension of Organic Chemistry 1 topics such as functional groups, stereochemistry and hybridization. The participants by their responses applauded the contribution of the approach in bringing of students together who came from different nations and nationalities while working together for common goals.

**Students' perceptions toward cooperative learning on open ended questionnaire**

All of the intervention group students appreciated the way they learned organic Chemistry with cooperative learning technique. The respondents commented briefly in the open-ended questionnaire administered on them by using their own mother tongue (Afan Oromo, amharic) and English as an option. Some of them responding in English said:

"Yes" to the question: *Do you think cooperative learning technique helped you in studying to achieve better good results in organic chemistry tests?*
To justify their answers, they explained that *"…cooperative learning helped us to share ideas with our partners without any fear or with freedom".* They continued: *"…when we want to ask question in the class we are usually ashamed of our instructor or our class mates due to different factors such as language difficulty,…etc. But, now it is better to ask our partners or group members and share ideas easily when we discuss with each other, which in turn help us to improve our achievements".*

Similarly one student specifically appreciated cooperative learning approach with a proverb in Oromo language as follows:

˝*Mukti tokko ni aara moo ni boba'aa?*˝
Translated in English as: *"unity is strength*˝ He further explained the proverb and said: *"working together using cooperative learning approach is better than individual work and this approach is very good, and I am happy about the approach"*

Other students indicated that working cooperatively with their own partners had helped them to dig out problems and find the answers to them. For example, one student said that *"Doing activities cooperatively with my partners makes me to know and understand concepts and problems more clearly that I am unsure of, how they are solved."* Also another student wrote that *"when I shared my idea with my group members and they shared to me their ideas, it highlighted gaps in my knowledge that I needed to go back to."*
Meta-analysis of vast research study on cooperative learning was done by Roger and Johnson, (1997). The result indicates that cooperation seems to be much more powerful in producing achievement than the other interaction patterns and students are *more positive about school, subject areas, and teachers or professors* when they are structured to work cooperatively.

**Interview results of Students' opinion about effectiveness of cooperative learning**
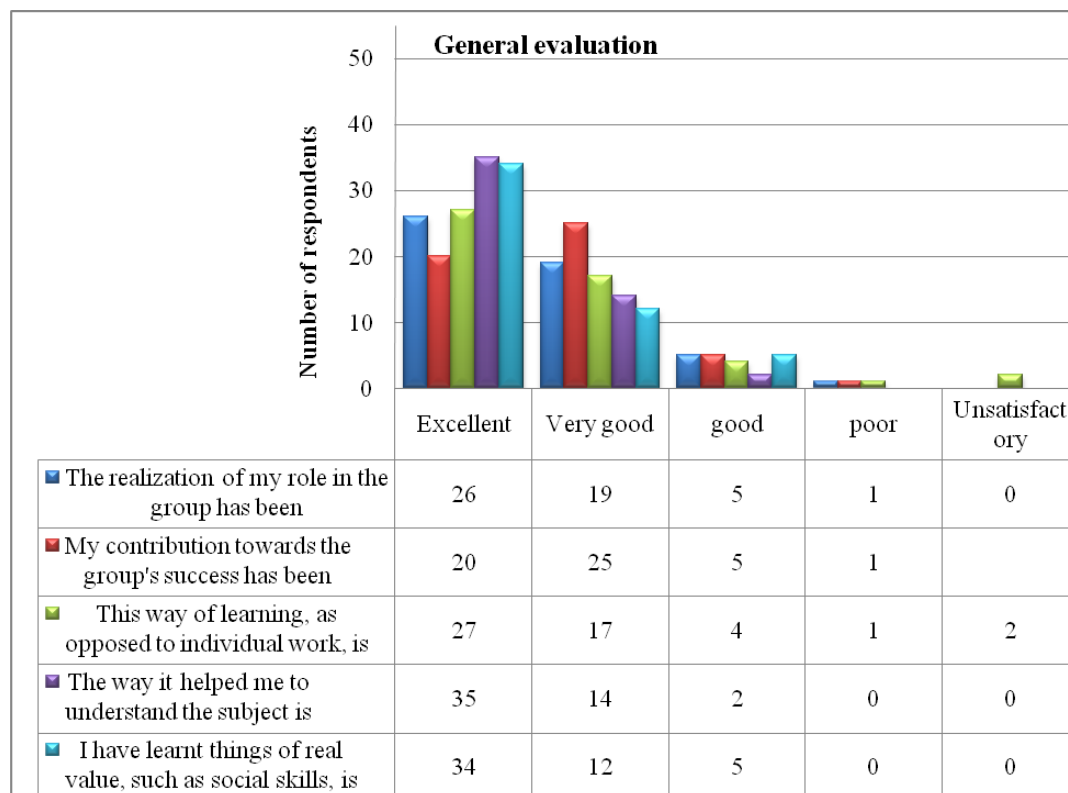Three students interviewed from Intervention group to further gather relevant information on the effectiveness of the cooperative learning in organic Chemistry class and to know the attitude of the students towards the method. They indicated that the cooperative learning tutorials helped them to understand the lecture content more clearly, because they had the brief discussion on each topic and on each question with their group members in class and out the class.
One of the interviewed students said that *"I have got an interesting experience from cooperative learning approach during Organic chemistry class, and because certainly it is an enriching program. Cooperative learning was extremely useful as it allowed me to discuss my idea with my friends, organizing the concepts discussed, separating what was more and less important, which in turn enhance my achievement. It is a great tool for learning and studying."*
This result is also in line with some previous reports such as Kegan, (2013). Nearly two thirds of the participants of this study rated their level of self-esteem as high, and felt positive about themselves when working in groups. More than three fourths of the students interviewed enjoyed working with everyone in their group and they had no preferences based on race or sex for team mates. Ahmad and Mahmood (2010) stated that students had higher achievement gains and motivation by using cooperative learning groups instead of traditional teaching

**General Evaluation of Intervention Group students on cooperative learning**

Fig.1 General Evaluation of Intervention Group students on the use of cooperative learning in organic chemistry class



| | Excellent | Very good | good | poor | Unsatisfactory |
|---|---|---|---|---|---|
| ■ The realization of my role in the group has been | 26 | 19 | 5 | 1 | 0 |
| ■ My contribution towards the group's success has been | 20 | 25 | 5 | 1 | |
| ■ This way of learning, as opposed to individual work, is | 27 | 17 | 4 | 1 | 2 |
| ■ The way it helped me to understand the subject is | 35 | 14 | 2 | 0 | 0 |
| ■ I have learnt things of real value, such as social skills, is | 34 | 12 | 5 | 0 | 0 |

This general evaluation of Intervention group students on cooperative learning considering their roles in the groups, contributions towards the group's success, cooperative learning approach comparative to individual work, the contribution of the approach to understand the subject better, the contribution of the approach in bringing of students from different nations and nationalities together while working for common goals proved to be generally better a approach as we see from the above figure. For instance, 45 (88.24%) of the 51 students in the intervention group saw the approach to be very good and in fact excellent way of realizing their individual roles and contributions to the success of their groups. In the same vein, 49 (96.08%) of the 51 students affirmed that the use of cooperative learning style actually enhanced their ability to comprehend the subject matter of functional groups, stereochemistry and hybridization and Organic Chemistry in general much better than the use of traditional and usual teaching strategy. Furthermore, with the above evaluation it became clear that the students learnt real life values including social skills with 46 (9.20%) seeing the method as a very good and excellent way of achieving such life skills simultaneously as high cognitive gains.

**Teachers` (researchers`) comments about the cooperative learning**

This research result (teacher checklist in appendix 1) leads one to believe that cooperative learning enables students to be actively involved in the study of the materials to be learned. Thus the students will have really learned the concepts rather than just memorizing concepts merely when they engaged themselves in cooperative learning process. Johnson and Johnson (1998) also asserted that cooperative learning leads to students learning more material, feeling more confident and motivated to learn, exhibiting higher achievement, possessing more positive attitudes toward the

subject studied, exhibiting greater competence in collaborative activities, and accepting differences among their peers.

From the observation held in the Intervention group students' class, the researchers was generally commented some important points as well as the challenges (challenge and strong side) here under:

**Conclusion**

From the comparison analysis between Intervention group and control group students, on the pre-test, quiz, assignment post tests, subjective questions and multiple choice questions, the two sample t-test indicates that the Intervention group students using cooperative learning tool showed better achievement than those who have learned with lecture method. Therefore, it is suitable to teach organic Chemistry with cooperative learning as it improves students' achievement. Similarly qualitative analysis of the data gathered from students through questionnaires and interview indicated that cooperative learning is effective tool helped the students; to solve problems together, to improve their achievement as well as communication and social relations.

These authors in conclusion noted that cooperative learning style has the weakness of effective management if the groups are many, the following stand as additional strengths of the approach:

❖ It is one effective of teaching complex and abstract subjects and topics such as Chemistry.
❖ Cooperative learning enhance learning to become more effective
❖ It makes learning to be more meaningful to the students.
❖ Cooperative learning is provides opportunities for active participation of students and interesting way to organize knowledge.
❖ Helping students to communicate with each other.

Indeed, the findings of this study proved that cooperative learning is a useful and beneficial teaching-learning tool and one learning strategy that can be used in chemistry departments to improve students' achievement, confidence, and communication, as well as social skills. In addition, it was noted that student's attitude toward this approach generally more positively directed.

**Recommendations**

On the basis of the findings of this study, the researchers recommend that:

1. Chemistry department teachers interject cooperative learning approach wherever possible in their lecture class for students` active participation the learning process. If the student takes an active role in his/her education, learning becomes more meaningful and his/her achievement improves.
2. Chemistry teachers at all levels particularly in Ethiopian higher education should adopt cooperative learning strategy as an effective learning strategy in order to enhance self-confidence and students' attitude towards the subject (organic chemistry.
3. Chemistry teachers arrange their laboratories and classrooms in such a way as to give more effective interaction among students in their study groups.
4. Chemistry teachers attend and participate in seminars, workshops and conferences cooperative learning strategy form part of or their main themes.

**Acknowledgements**

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**Appendix 1:**
**Table 2 Check list filled by researcher on cooperative learning class,**

| No | Statements | Entirely | Largely | Some what | Slightly | Not at all |
|----|-----------|----------|---------|-----------|----------|------------|
| 1. | To what extent I structured students during cooperative learning activities in organic chemistry class to ensure that all group members actively work together? | | √ | | | |
| 2. | In my cooperative learning activity in organic chemistry class, to what extent group members actively participate? | √ | | | | |

| 3. | In my cooperative learning activity in organic chemistry class, to what extent students complete their share of the group task? |  | √ |  |  |  |
|---|---|---|---|---|---|---|
| 4. | To what extent I implemented cooperative learning, in order to increase academic achievement in Organic chemistry? | √ |  |  |  |  |
| 5. | To what extent I implemented cooperative learning in organic chemistry class in order to improve social skills? | √ |  |  |  |  |
| 6. | To what extent I implemented cooperative learning in organic chemistry class in order to motivate students? | √ |  |  |  |  |
| 7. | To what extent I implemented cooperative learning in order to raise self-esteem? | √ |  |  |  |  |

**Appendix 2**

**Students' Organic Chemistry Achievement Test (SOCAT)**

**Instruction: Carefully consider each of the following questions and write the letter of your choice from the given alternatives in or complete in the space provided under each question.**

1. Which of the following structures are resonance structures of each other?
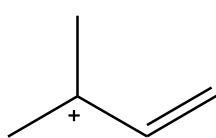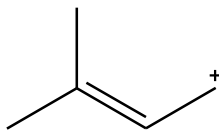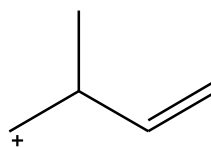


    a                          b                          c

    A. a and b
    B. b and c
    ……………………………..
    C. a and c
    D. none of these

2. Which of the following statements is correct?
    A. The carbon- carbon distance in acetylene is longer than in ethylene
    B. The carbon hydrogen bond in acetylene is weaker than the carbon hydrogen bond in ethane
    C. The carbon – carbon distance in acetylene is shorter than in ethane
    D. The statements (the carbon-carbon distance in acetylene is longer than in ethylene) and (the carbon hydrogen bond in acetylene is weaker than the carbon hydrogen in ethane) are correct.

    …………………………………..

3. Consider the bonds 1-5 in the following molecule.

$$H-\overset{\underset{|}{H}}{\underset{H}{C}}\overset{1}{=}\overset{2}{C}\overset{|}{\underset{H}{}}\overset{3}{-}C\overset{4}{\equiv}C\overset{5}{-}H$$

Which is true for C-C bond length?
   A. 2<3<4
   B. 4<3<2
   C. 3<2<4
   D. 4<2<3

……………………………………..

4. A straight chain hydrocarbon has the molecular formula $C_8H_{10}$. The hybridization of the carbon atoms from one end of the chain to the other are respectively $sp^3$, $sp^2$, $sp^2$, $sp^3$, $sp^2$, $sp^2$, sp and sp. The structural formula of the hydrocarbon would be:

A   $CH_3CH=CHCH_2-CH=CHC\equiv CH$

B.   $CH_3CH_2-CH=CHCH=CHC\equiv CH$

C.   $CH_3CH=CHCH_2-C\equiv CCH=CH_2$

D.   $CH_3C\equiv CCH_2-CH=CHCH=CH_2$

……………………………………………………………..

5. The bonds between carbon atom (1) and carbon atom (2) in the compound

$$N\overset{1}{\equiv}C\overset{2}{-}CH\overset{3}{=}CH_2$$   Involves the hybrid as

   A. $Sp^2$ and $sp^2$
   B. $sp^3$ and sp
   C. sp and $sp^2$
   D. sp and sp

………………………………………..

6. Which is not a valid resonance structure for an ion bellow?

A          B

C          D

………………………………………..
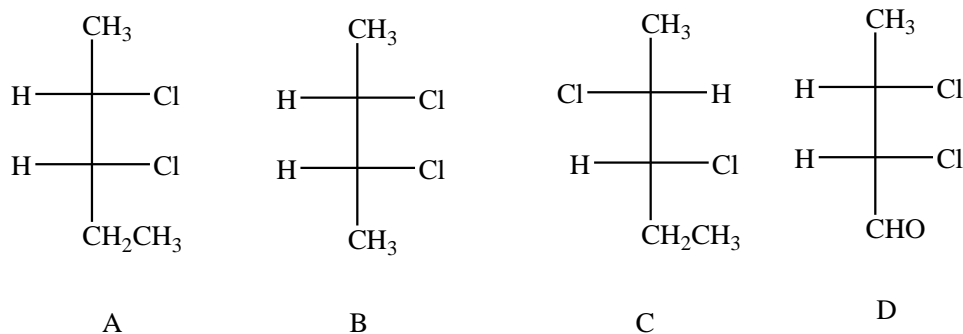
7. Which of the following compounds is/are chiral?

I. 1,1-dichloropentane
II. 1,2-dichloropentane
III. 3-chloropentane
IV. 2,3-dichloropentane

A. II
B. II and IV
C. IV
D. II, III and IV
E. I and III

……………………………………

8Which of the following is *meso* compound?



A          B          C          D

………………………………………….

9. Which of the following statements correctly describes to a pair of enantiomers?
A. They rotate the plane of polarized light by exactly the same amount and in opposite directions.
B. They rotate the plane of polarized light by differing amounts and in opposite directions.
C. They rotate the plane of polarized light by differing amounts and in the same direction.
D. They have different melting points.
E. They have the same melting point, but they have different boiling points.

………………………………………….

10. Which statement is not true for a *meso* compound?
    a.   The specific rotation is 0º.
    b.   There are one or more planes of symmetry.
    c.   A single molecule is identical to its mirror image.
    d.   More than one stereogenic center must be present.
    e.   The stereochemical labels, (R) and (S), must be identical for each stereogeniccenter.

..................................................

11. Which of the following cyclohexane conformations has the GREATEST energy (is the LEAST stable)?

    A.   chair
    B.   half-chair
    C.   boat
    D.   twist-boat

..................................................

12. Which of the following molecules is achiral?
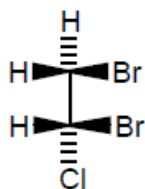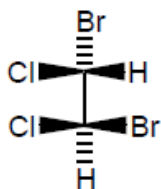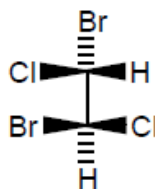


    A.             B.            C.    D. A & B    E. all of them

..................................................
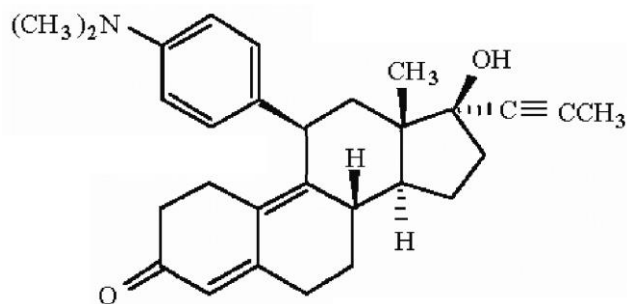


13. How many asymmetric carbons are present in the compound below?
    A.  4
    B.  6
    C.  5
    D.  7
    E.  8

..................................................

14 Which of the following statements is (are) true for the compound (3R, 4R)-3,4-dimethylhexane?

A. This compound is chiral.
B. The enantiomer of this compound is (3S, 4S)-3,4-dimethylhexane.
C. This compound is a diastereomer of (3R, 4S)-3,4-dimethylhexane.
D. all of the above
E. none of the above

…………………………………………

15. Which of the compounds bellow exists as only three stereoisomers?

   A.      2,3-dibromopentane
   B. 1,4-dibromobutane
   C. 2,3-dibromobutane
   D.      None

16 Which of the following conformer is the most stable in the conformation of butane?
A. Eclipsed
B. Anti conformation
C. Gauche
D. skew

………………………………………………………….

17. Which of the following terms correctly describe(s) the structural relationship between cis-1, 3-dimethylcyclopentane and trans-1,3-dimethylcyclopentane?

   A. enantiomers
   B. diastereomers
   C. both A and B
   D. none

…………………………………………………

18. The carbohydrate D-threose has the following Fischer projection:

$$
\begin{array}{c}
CHO \\
HO-\!\!\!\!-\!\!\!\!-H \\
H-\!\!\!\!-\!\!\!\!-OH \\
CH_2OH
\end{array}
$$
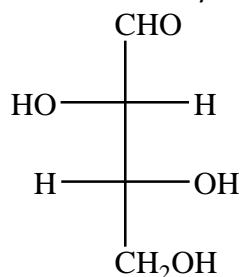
Write the absolute configurations of the two chirality centers in D-threose.

   …………………………………………………..

19. Show the formal charges on all the atoms, other than hydrogens, of the following compounds. (The unshared electrons are not shown; you must determine their locations. *Hint: octet rule*)
   a) $CH_2=N—C=O$            b) $CH_3—CH—NH—Cl$

   ……………………………………….
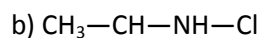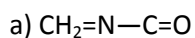
20. Arrange the following alkanes in the increasing order of their boiling points. a) 2-methylhexane, b) pentane c). 2,2-dimethylpropane, d) 2-methylbutane, e) heptanes, f) octane, and g) hexane.

……………………………………………………

21. In cyclohexane l,3-diol, the cis (a,a) conformation is more stable compared to (e,e) conformation. Explain your answer briefly.

……………………………………………………………………………………………………..

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22. ($R$)-HOCH$_2$CHOHCH=CH$_2$ reacts with cold, alkaline KMnO$_4$ to give two products having the same formula, HOCH$_2$CHOHCHOHCH$_2$OH. One product is optically active and the other is optically inactive. Give the two absolute configuration and $R/S$ specification of the two products.

# TEACHER EMPOWERMENT THROUGH PEDAGOGICAL RENEWAL FOR EFFECTIVE IMPLEMENTATION OF BASIC EDUCATION CURRICULUM IN NIGERIA

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## Abstract

Citing relevant literature on the subject, this paper makes the case that teachers in Nigeria's basic education sector, particularly those in primary schools, are generally ill-prepared for enacting learner-friendly approaches in their teaching. This is because of the poor initial training they received, low motivation and limited opportunities for regular in-service training, among other factors. The paper therefore examines the wider implications of these issues on the training and retraining of teachers for the UBE programme in Nigeria. The paper recommends for a thorough review of teacher education curricula, particularly the Nigeria Certificate in Education (NCE) programme, and enhancement of regulatory frameworks in line with the provisions of both the UBE implementation guidelines and the National Teacher Education Policy of 2009. These measures are necessary in order to guarantee the production of teachers of high quality for implementing basic education in Nigeria**.**

**Keywords:** Pedagogical Renewal, Teacher Empowerment, Universal Basic Education (UBE).

## Introduction

Teacher supply, quality, and professional development are central to the attainment of universal goals of improving access to education of good quality for all children of school age as well as those who have missed out (Dembélé & Lefoka, 2007). In Nigeria, achieving universal access to Education for All (EFA) was made into a binding legal commitment that the state has towards its citizens with the passing into a law of the Universal Basic Education (UBE) Act in 2004. The Act anticipates that the implementation of UBE programme will remove all distortions, inconsistencies and barriers to equitable access to and qualitative provision of education at the basic level. Yet, the existing number and quality of teachers coupled with weak capacities of teacher education institutions/programmes in Nigeria, the most populous country in Africa, does not give much optimism that the estimated 1.6 million new teachers needed to achieve EFA goals in Sub-Saharan Africa could be realised before 2015 (Motivans, Smith, & Bruneforth, 2006). But the Federal Government of Nigeria (FGN) has repeatedly drawn attention of its critics to various programmes it has embarked upon that aim at fast-tracking developments in education as part of its overall strategy of national reform to meet present and emerging local needs and global challenges. Improvements in teacher supply and quality have therefore consistently appeared, with varying degrees of emphases, as policy goals in national reform programmes and strategies such as Visions 2010, 2020; National Economic Empowerment and Development Strategy (NEEDS), and Subsidy Re-investment and Empowerment Programme SURE-P. In addition, Nigeria has put in place a National Teacher Education Policy, NTEP, (FME, 2009) that recognises the role of in-service teacher training in improving teacher motivation and instructional quality, and made proposals for integrating it with pre-service teacher education.

However, governments' investments in the education sector are seriously affected by weak institutional, infrastructural and resource frameworks at the level of schools and classrooms. These weaknesses have given rise to inadequate school facilities and materials; rigid curricula content and

practices; inadequate supply, poor motivation and poor quality of teachers particularly at the primary level (FGN, 2000). It is therefore not surprising that curricula practices in many Nigerian primary schools are characterised by teacher absenteeism, apathy, resistance to change, and persistence in the use of teacher-dominated content-based teaching strategies and approaches (National Planning Commission, NPC, 2004). This approach to teaching is generally labelled as "traditional" and it limits the chances that students enrolled in schools will acquire the competences and skills that a broadened vision of basic education promises all learners.

If teaching is the strongest determinant of student achievement at the school level, as several years of research has shown (Motivans et al., 2006); then, providing teachers with the knowledge, skills, and attitudes that will enable them change to more effective teaching approaches deserves to be given a priority by all education stakeholders. In other words, the case for teacher pedagogical renewal becomes even more compelling. Dembélé & Lefoka (2007, p. 534) define pedagogical renewal as "a planned qualitative change towards a desirable teaching practice, that is, a practice that ensures expected student learning and achievement". It is anchored on a paradigm shift of leaner centeredness, activity-based learning, and responsiveness to learner diversity. Nigeria's policy on teacher education, NTEP, has re-emphasised some of the key features of pedagogical renewal such as adequate and sustained teacher training in content and pedagogy, adequate supervision and support for teachers, and continuing professional development as some of the core principles that influence the country's approach to teacher education (FME, 2009).

Against the background of the implementation of the UBE in Nigeria this paper attempted two major tasks. The first major task of the paper is to analyse the implications of the implementation of the UBE on both the performance of teachers and the institutions responsible for producing them. The second concern of the paper is to establish a case for going beyond policy statements to empower teachers through pedagogical renewal for the challenges of implementing UBE in Nigeria.

**The Universal Basic Education (UBE) Programme in Nigeria**
The UBE Programme is a nine-year free and compulsory basic education programme that was launched and executed by the FRN to eradicate illiteracy, ignorance and poverty as well as stimulate and accelerate national development, political consciousness and national integration. The UBE Programme is Nigeria's strategy for the achievement of EFA goals and Millennium Development Goal Two (MDG2) that promises universal access to primary education for all children (NPC, 2004). According to Federal Ministry of Education (FME, 2000) the universalization of basic education is also in keeping with the educational objectives stated in Section 18 of the 1999 Constitution of the FRN as follows:

1. Government shall direct its policy towards ensuring that there are equal and adequate educational opportunities at all levels.
2. Government shall eradicate illiteracy.
3. The UBE programme is intended to be universal, free and compulsory.

These provisions imply that appropriate types of opportunities should be provided for the basic education of every Nigerian child of school age, that parents have an obligation to ensure that children in their care avail themselves of such opportunities, and that sanctions will be imposed on persons, societies or institutions that prevent children, adolescents and youth from benefitting from UBE.

The broad aim of basic education for all in accordance with the Jomtien declaration is to lay the foundation for life-long learning through the inculcation of appropriate learning –to-learn, self-

awareness, citizenship and life-skills. However, when UBE programme in Nigeria was launched in September 1999, it was geared towards achieving the following objectives:

1. Developing in the entire citizenry a strong consciousness for education and a strong commitment to its vigorous promotion
2. Ensure unfettered access to nine years of formal basic education.
3. The provision of free UBE for every Nigerian child of school going age.
4. Reducing drastically the incidence of drop-out from the formal school system, through improved relevance, quality and efficiency
5. Ensuring the acquisition of appropriate levels of literacy, numeracy, manipulative, communicative and life skills as well as the ethical, moral and civic values needed for laying a solid foundation for life-long learning (FRN, 2000).

It is quite relevant to state here that basic education according to the Jomtien Declaration and Framework of Action on EFA is neither defined in terms of nor limited to years of schooling. Jomtien perceives education in its broadest sense as of a close articulation of the formal, the non-formal and informal approaches to and mechanism for the awakening and the all-round development of the human potential. The broad aim is to lay the foundation for life-long learning through the inculcation of appropriate learning-to-learn, self-awareness, citizenship, and life skills. The UBE programme in Nigeria covers Early Childhood Care and Education, six-year Primary Education, and three years of Junior Secondary Education. Given the central role that teachers play in school-level implementation of education programmes as stated earlier, a broadened vision of the UBE as outlined in its objectives are capable of putting strains on already fragile situations of teacher supply and quality in Nigeria. The next section of this paper examines teacher performance in relation to the expectations brought about by the implementation of the UBE by focusing on students' performance as a key indicator of internal efficiency of an education programme.

**Pedagogical Challenges of Basic Education Delivery in Nigeria**
The National Policy on Education, NPE, (FRN, 2004) acknowledges the central role that primary education plays as the bedrock upon which all other sectors of the education system are rested. It is aimed at laying the foundation for lifelong learning by developing in the learners the basic learning tools of literacy, numeracy, and communicative abilities; developing the foundations of science and the acquisition of manipulative skills; providing citizenship education and training in moral values that will enable the learner live his/her life usefully and functionally in society. However, the UBE programme upholds that for primary schools to develop these competencies in learners, sustained efforts must be put in place to remove sources of inefficiency, obstacles and contradictions in the system in such a way that problems of access, equity and quality of learning are addressed. The attainment of EFA goals are seriously compromised by limited access; poor learning outcomes, wide disparity in enrolments, retention, completion and achievements across gender, rural-urban locations and socio-economic status that are acknowledged to characterise the nation's education system, primary education in particular (FGN, 2000).

A key indicator of the internal efficiency of the primary education sector in particular is the learning outcome experienced by pupils who had undergone either the complete cycle or some years of primary education. A determination of learning achievements in the four core subjects among primary 4 pupils was first carried out in 1996; it was called Monitoring of Learning Achievement (MLA). The result of the survey showed low achievements in three key areas of literacy, numeracy and life skills with national mean achievements of 25%, 32% and 36.9% respectively. The result also revealed wide variations between private and public schools.For instance, the study found that pupils enrolled in private schools outperformed those in public schools just as pupils of urban

schools performed better than those of rural schools in literacy, numeracy, and lifeskills. Overall however, the pupils generally tended to perform better in oral tests than in written tests (Falayajo, Makoju, Okebukola, Onugha, & Olabodun, 1997). A follow-up survey of learning achievements carried out by the UBE in 2001 showed slight improvements but still disturbing low levels of performance in key areas of English with 40% and Mathematics with 34%. Both the 2003 Education Sector Status (ESS) report (FME, 2003), which reported these figures, considers the low achievement levels as evidence of low internal efficiency and a reflection of poor quality of resources (including teachers) at the primary school level.

The primary education sector is characterised by three disturbing trends with regards to teacher supply. These are inadequate number of qualified teachers; poor quality of the teaching force; and persistent use of teacher-dominated, content-loaded, and examination-centred teaching approaches by teachers (Isyaku, 2002; Maiga, 2006). These problems are compounded by inadequacy and poor quality of teaching and learning materials; disproportionate enrolment patterns characterised by over – populated classes in the urban areas and low enrolments and irregular attendance in rural areas; and poor motivation for learning on the part of the pupils. These developments limit the capacities of the primary education sector to develop in the learners the critical knowledge, skills, competencies and attitudes that are needed to develop a learning society equipped to face the unending challenges of modern living.

A reform of instructional delivery practices in primary schools is therefore necessary in order to reposition the sector towards achieving the goals of increased access, equity and quality of basic education. There is a growing concern that poor learning outcomes experienced by pupils in schools negatively impacts on enrolment and retention of children at schools. This is particularly so in view of the enormous sacrifices that poor and rural parents have to make in order to send and keep their children in school (Sedel, 2005). The prospect of alternative income earning engagements which children could be put to becomes more appealing where parents judge school outcomes to be poor and irrelevant to their immediate circumstances and needs. This is what makes the actions of teachers in their schools and classrooms critical to the attainment of the goals of UBE.

**Pedagogical Renewal for Basic Education Delivery**
The crux of the issues highlighted above devolve on the need for a reform of school practices and pedagogy in such a way that pupils enrolled experience significant and effective learning that will equip them with the tools, knowledge and skills needed for life-long learning and useful living in knowledge-driven economies of the 21st century. This section of the paper highlights the key issues that are pertinent to a reform of pedagogical practices in Nigeria's basic education sector. In doing so, the paper holds the view that teachers are the most critical factor in any education system because pupil learning is influenced a great deal by what and how teachers teach which is in turn influenced by the knowledge, skills and commitment teachers bring to the job (Ukeje, 1996; Tahir, 2006). A number of issues emerge with regards to positioning teachers for playing their appropriate roles in the implementation of the UBE programme:

The first of these issues has to do with quality of pre-service training. The type of teaching that teachers implement in the classroom are determined by the quality of pre-service training they received and the opportunities they have for continuous on the job training to cope with emerging challenges (ref). Over the years, institutions responsible for the training of teachers, Colleges of Education (COEs) in particular, are faced with the challenge of poor quality of their products as evidenced by their classroom performances. Inadequate funding, poor quality of teaching force, low quality of entrants into the NCE programmes, inadequate infrastructure and teaching materials have been identified as some of the factors that limit the effectiveness of teacher training received in COEs (Okebukola 1996; Isyaku, 2002). In addition, there is the problem of mismatch between the

NCE curriculum and job expectations of teaching in lower and middle basic education classes (or primary school) curricula (Ali, 2000). The NCE programme which was originally designed as a preparation for teaching in secondary schools reflects more of the content organisation of that level than the primary school curricula. This situation makes NCE teachers unprepared for implementing the robust demands of the new basic education curricula especially at the primary school level. In addition, teacher education programmes in Nigeria, as in many other sub-Saharan African countries, emphasise too much content knowledge and very limited opportunities for the acquisition of hands-on pedagogical skills that are needed for effective teaching (Sedel, 2005). For instance, Micro-Teaching and Teaching Practice as components of the professional teaching skill acquisition programmes are given limited duration and poorly executed in many teacher education institutions (Okebukola, 1996; Maiga, 2006). Given this scenario, it is therefore not surprising that teachers in primary schools display limited content knowledge; persist in the use of teacher-dominated and content-loaded teaching approaches that are incapable of equipping the learners with thinking, learning and problem-solving skills that are the focus of UBE programme.

The second issue relates to the re-training and continuous professional development of teachers. Mohammed (2006) laments how the professional development of teachers in Nigeria has suffered because of some erroneous assumptions long held about self-sufficiency of pre-service training of teachers. The nation's education system, he argues, had behaved as if pre-service teaching qualification such as the NCE was all that teachers needed for their career-long practice. The system further assumed that the possession of NCE was enough preparation for teachers to handle all courses in the primary school curricula and confront all emerging challenges in their teaching careers. This thought pattern has led to the neglect of in-service on-the-job training of teachers which is critical for teachers' performances and professional development. Without sustained programmes for updating their knowledge, skills and competencies, teachers are prone to rigidity, resistance to change and may resort to common sense and traditions in responding to new demands and challenges

The third major concern regarding teachers is their competences and skills in ICT: With the current global focus on lifelong and inclusive education, there is need for preparing teachers with ICT competences. However, Hooker, Mwiyeria, and Verma (2011)reported that, even the newly revised NCE curriculum by the National Commission for Colleges of Education(NCCE) does not provide NCE graduates with in-depth knowledge and skills for integrating ICT into school curricula and teaching practices. The curriculum provides limited opportunities for follow-up on student teacher graduate application of ICT skills in their classrooms when they take up regular teaching appointments.

There is also a concern over teacher motivation and commitment. Inadequate motivation for teachers in terms of appropriate and timely remuneration; regular promotions and advancement as at when due; improved working environment and tools; could lead to teacher burn out, apathy and passivity. This could give rise to negative practices by teachers such as absenteeism, teachers reporting to school but refusing to do any teaching; hostility towards pupils; engagement in alternative income-generating ventures that take away teachers' time and attention from their primary assignments. Given this context, teachers are least likely to rise up to the expectations placed upon them of providing the necessary guidance and using adaptive and innovative teaching strategies that could lead to the development of competent learners.

Finally, there is the issue of resource mobilisation and utilisation. Primary schools in Nigeria are operating amidst massive inadequacies of basic infrastructure, facilities and learning materials; it is either they are inadequate or non-existent. It is for this reason that massive rehabilitation and provision of infrastructure and learning materials are among the interventions embarked upon by

the Universal Basic Education Commission (UBEC) in the implementation of the UBE programme (Tahir, 2006). When teachers operate with lean resources and over-sized classes, they are likely to be overwhelmed and become incapable of introducing learner-friendly teaching approaches that are being advocated as part of the basic education reforms. This may be compounded where teachers are poorly trained and have low motivation for the job.

The import of these revelations to this discussion is to bring to fore the background factors that could limit the effectiveness of teachers in implementing the basic education curriculum. The challenge of teacher pedagogical renewal is that teachers are not the only determinant of its success; it also requires managerial support, improvements in teaching and learning environment, and a renewal of the curriculum itself (Dembélé & Lefoka, 2007). Where teachers become constrained by their own inabilities or by external deficiencies to effectively implement the curriculum at the school and classroom levels; the goals of improved quality, equity and access in the delivery of basic education and the attainment of the goals of UBE, Education for All (EFA) and Millennium Development Goals (MDGs) may be at risk. This is in view of the centrality of teachers in the implementation of educational policies as demonstrated in the preceding sections of this paper.

**Implications for Reform of Teacher Education in Nigeria**
The issues highlighted above have some implications for the renewed attempts to reform teacher education in Nigeria in line with expectations brought about by the implementation of the UBE programme. A few of these are stated as follows:

There is a strong need for a concurrent and regular review of both primary education and Nigeria certificate in education (NCE) teacher education curricula in order to establish a synergy between teacher training and teacher job expectations within the context of the UBE. Since the Federal Government of Nigeria has produced a 9-year basic education curriculum. The NCE teacher education curriculum needs to be realigned to this new reality.

Rigorous accreditation and other quality control procedures need to be enhanced as part of the strategies to regulate NCE-awarding and other teacher education institutions to ensure compliance with the academic and professional standards set by the NCCE and Teachers Registration Council of Nigeria (TRCN) respectively.

The continuous professional development of teachers should be incorporated as a policy framework within the UBE programme so that the on-going programmes for the training of teachers that are implemented as part of the UBE programmes could be sustained. Without an enduring policy framework, trainings provided could become ad hoc and largely unrelated to the needs of schools, learners and teachers.

Attention of governments and other employers of teachers should be drawn to the need for improved welfare for teachers. The incessant strike action embarked by teachers under the umbrella of the Nigeria Union of Teachers (NUT) is a welcome wake-up call to the plight of teachers. Governments and other stakeholders should take the proper measures to ensure improved conditions for teachers; but this must go beyond salary increase and incorporate other aspects of conditions of service: promotions, societal recognition, and conducive working environments. The NTEP has also recognised these needs, and has embodied them among the key principles upon which teacher development in Nigeria is anchored (FME, 2009). What is required is for governments and its agencies to implement these provisions.

**Conclusion**

The challenges faced in the educational sector are enormous and daunting; they include limited access, equity, poor quality and lack of relevance of the education provided in schools to local needs and global challenges. These challenges provide the motivation and impetus for the UBE programme which is a Federal Government's intervention measure to provide equitable access to good quality basic education to all citizens. However, educational policies and programmes embarked by government, no matter how well conceived, need competent teachers to bring them to fruition. The actions of teachers in classrooms among millions of learners with diverse characteristics and needs are influential in determining the success or failure of developmental programmes on education such as the UBE. How teachers perform in the classroom through the methodologies they use, the assumptions they hold, and the attitudes they bring to the class generally reflect the type of training they received and the opportunities they have for continuous self-improvement. Therefore public and scholarly concerns over the quality of teachers in terms of poor pre-service training they receive, their limited opportunities for continuous professional growth, poor motivation and inadequate working tools and resources need to be tackled with all seriousness. The ultimate goal of all efforts towards teacher education and renewal is to guarantee the production of the calibre of teachers who are capable of bringing about the much-needed pedagogical reforms in their classrooms.

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# ACADEMIC INTERVENTION PROGRAMMES: A Way to go or Not?

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**Abstract**

The use of academic intervention programmes in addressing the under-preparedness and low entry scores of university first year students is fast becoming a worldwide institutional practice. Likewise universities in South Africa continue to experiment with entry level assessment tests which are complemented with intervention programmes with a view to diagnose and determine programmes that will improve the chances of non-qualifying students to participate competitively with those who are more prepared for higher education. Consequently, different research studies on the impact of these intervention programmes and whether they ensure behavioural change through improved academic performance have been conducted using various methodological approaches and yielding interesting findings and conclusions whilst prompting further enquiries. Research in this area is also very important as it seeks to validate the value or lack of these intervention programmes especially where throughput rates are concerned. In this paper we present a case for a research conducted on the impact of an academic intervention programme on test scores of first year university students in the Faculty of Science Engineering and Technology (FSET) departments at Walter University, recently. The study was executed to validate a hypothesis of a correlation between SATAP test scores and a language literacy intervention programme. Thus the effect of the academic literacy intervention programme on the Standardised Assessment Tests for Access and Placement (SATAP) English test scores was used to verify the validity of the hypothesis. The resulting outcomes of the study indicated that the difference between the pre-test scores and the post-test scores is statistically significant, and that the post-test scores were in fact significantly higher than those of the pre-test. Further the hypothetical relationship between the intervention programme and the SATAP test scores was significantly affirmed.

**Keywords:** intervention programme**,** academic support; academic literacy; first year university students; Pre-test and post-test; SATAP; extended studies; drop-out; academic failure.

## INTRODUCTION

One of the major challenges facing most higher education institutions is to provide support to struggling learners through extended studies and foundation type programmes as part of the formal offerings to mitigate, amongst others, the learning incapacities and the drop-out rates. South African institutions of higher learning are faced with unprecedented learner high drop-out rates, thus increasingly effective solutions are sought to address and subsequently reverse this negative trend. Learner attrition continues to plague education with repercussions most felt by learners, institutions as well as the country. This situation subsequently necessitated a debate around the pertinent question: why are students not achieving academically? In  answering this question, the lack of preparedness among first-year cohorts has been the most popular retort from concerned academics. Murray (2010:56) further states that there is an increasing widespread perception within higher education that the language and literacy skills of students of both English speaking backgrounds and non-English backgrounds, is in a state of decline. In view of this response, many institutions therefore have realised the need to provide academic and personal development support to the students they have admitted to their study programmes and to assist them to graduate at the end of

their studies. Thus most universities have embarked on several strategies that include entry assessment tests, academic intervention programmes and extended study programmes in an effort to accommodate, align and integrate academic support into the mainstream curriculum.

In this paper we present a strong case for the impact of language literacy academic intervention programme on the performance of entry level students at Walter Sisulu University. The effect of the programme, as per the research findings, has been observed from the SATAP test scores of participating students at FSET departments, comparatively before and after the test was administered. In our discussion we will provide a brief background of our study with focus on the purpose, hypothesis, aims of the study, literature review, methodology, findings and conclusion. Using the findings, we will argue for the significance and value of the changes in performance scores and the implications for the hypothesis.

## BACKGROUND TO THE STUDY

## WHAT IS AN INTERVENTION PROGRAMME?

Operationally the concept of an intervention programme has been used in this context to denote a purposefully designed course to serve students who are at risk of not reaching their academic goals or maintaining their academic grades. The programme provides content for instruction intended for use in differentiated and intensive instruction to meet student learning needs in one or more of the specific areas of reading. It is implemented as extra assistance and support with the goal of changing behaviour or preventing a problem. At WSU the English literacy intervention programme is an academic curriculum designed specifically to address a certain language related learner problem identified through an entry assessment test such as the SATAP test.

## PURPOSE

Through this study we seek to confirm or refute a hypothetical correlation between the academic intervention programme and the SATAP test scores of first year university students.

## HYPOTHESIS

In response to the challenges facing first year students at university outlined earlier here, our hypothesis has been derived from a suspected correlational relationship between an academic English literacy intervention programme and the scores of a SATAP entry level test administered prior and post the programme to first year learners at admission. Therefore the hypothetical question is stated as follows: Is there a causal and correlation association between the academic literacy intervention programme and changes in the pre and post SATAP test scores?

## RESEARCH QUESTIONS

The following questions have motivated our curiosity to interrogate the hypothesis further thus in the process, establish the impact of the intervention on performance in the test. These sub-questions then follow from the hypothesis:

- Has the academic literacy (AL) intervention programme impacted on the SATAP English test scores of first year learners in the FSET? In other words, is there a direct impact of the intervention programme on the improvement and increase or lack of on the test scores of learners as evidenced in pre and post testing?

- Can the effect on SATAP test scores of learners who have been subjected to the Academic Literacy intervention programme be solely attributed to the intervention programme and no other intervening variable?
- Have the skills gaps identified in the pre-test been resolved in the post-test due to the Academic Literacy intervention?
- Is there a cause and effect co-relationship between the intervention and the test scores such that the two variables covariate?

## UNIT OF ANALYSIS AND SAMPLE

The study focused on the performance of first year students in the SATAP test before and after they were subjected to an English literacy skills intervention programme. Therefore our unit of analysis is their performance through the effect of the programme as an independent variable and the impact it has on SATAP test as a dependent variable.

Using the convenient purposeful sampling method also known as the available sample by McMillan and Schumacher (2006;125), a sample of 120 participants from the Electrical, Civil, Building and Mechanical Engineering departments in the Faculty of Science, Engineering and Technology (FSET)  at WSU were randomly selected to serve as an experimental group. The choice of the sample was informed by firstly the availability of subjects for selection by their various departments to write the SATAP tests, secondly and the fact that they were representative of a typical profile of learners with challenges that can be addressed with the test, thirdly to determine their academic skills and therefore assist in identifying learners who might need academic support in order to cope with their studies. The target population consisted of first year students who had been admitted in the four departments, namely; Civil, Electrical, Building and Mechanical Engineering within the FSET.

## THEORETICAL FRAMEWORK

This enquiry in its construction has been informed theoretically by the emancipatory paradigm, social constructivism and the deficit-based approach for obvious reasons of relevance and responsiveness. Further the theoretical framework in its use here has been interpreted within the context of the South African environment and specifically that of WSU. Thus the interpretation of these schools of thought has been contextualized to fit the motivation for this study congruence.

### Emancipatory paradigm
According to Hutton and Thompson (2000), the emancipatory paradigm has been described as viewing the world with its growing inequalities of income and wealth, massive inequalities in relation to cultural recognition and social diversity, and huge inequalities arising out of access to information. They further state that there is a widening divide between those who are highly educated, skilled and well- paid specialists and those who are less skilled but currently employed, and the third of the population, who are poorly educated, poorly qualified, casualized, unwaged and unemployed. The emancipatory paradigm closely linked to the principles of critical theory. The Centre for Learning and Teaching Development (CLTD) at Walter Sisulu University (WSU) therefore took on a critical and emancipatory stance, especially when viewing the immense changes within historical development of education over the past decades, as well as their ever-changing feature as Eloff and Ebersohn (2004) puts it. This study also critically took into account the applicability of academic and learning support approaches and practices applied by higher education institutions.

**Social constructivism**

Social constructivism explains the learning process of constructing new knowledge which varied across different social context and historical times. This theory postulates that the knowledge is "built up and passed on through constant process of social interaction" (Donald 2002:72). This has been a key point that needed to be taken into account when developing the Academic Literacy intervention programme because it was not merely a process of handing over academic literacy knowledge, but taking into account the social tools such as language, interaction and history, that played a role in the students' "cultural capital" as suggested by Bourdieu (1986). With more and increasing interest in this school of thought a paradigm shift from a deficit-based to asset-based approach for student counselling and academic support services at Universities, because all students have strengths, skills and talents. Eloff and Ebersohn (2004) concurred by stating that a needs-based approach was efficient in addressing the challenges facing modern-day societies and was particularly inadequate in the South African context. An asset-based approach focused on identifying the assets (positives and other relevant resources) which surround the learners, instead of focusing on the prevailing deficits, and it is applied to the learners' benefit. Further discussion on this approach claim that it is more applicable and beneficial in the process of an Academic Literacy intervention programme in an attempt to address the students' learning support needs, than a deficit approach. The deficit-based practices compelled universities to set their existing values and expectations as the standard and rate that reflects many students as not good enough whilst the cultural capital theory suggested an understanding of cultural diversity without an implicit value judgment.

Bourdieu's cultural capital theory Langdon (2004) applied to students from disadvantaged backgrounds, shows that many of these students appear to be unable to position themselves to take advantage of opportunities available to them at institutions. They do not always have the cultural capital to succeed in higher education because they were not exposed to effective schooling, learning and studying. According to this theory the institution needs to facilitate the development of appropriate types and levels of cultural capital within the students to improve their chances at success. This was where the CLTD at WSU played a role in infusing the academic literacy intervention course into the extended programme curriculum.

Research points to several types of support that promote learning and retention, in particular academic support. At WSU through placement tests which are administered at the beginning of the year for first- year learner, it has been identified that learner enter university insufficiently prepared for the rigors of university study. The CLTD due to the above-mentioned challenges offers an array of students' academic support and intervention programmes namely Life Skills, Writing and Reading Course, Peer Assisted Learning previously known as the Supplemental Instruction and the Academic Literacy which this study particularly focuses on. These courses offer much needed support for individual learners and groups of learners who might otherwise find themselves out of place, in a setting where they are not familiar with. For new learner this Centre which offers such valuable support serve as a secure knowledgeable point of entry that enables learner to safely navigate the unfamiliar terrain of university.

Tinto (1997) argues that, academic support is effective when it is connected to students' daily learning needs, in ways that enable students to utilize the support they receive to learn and succeed in the classroom in which they are enrolled. He further sums up this argument by saying that students are more likely to learn and persist when they find themselves in settings that hold high expectations for their learning and provide needed academic support and frequent feedback about their learning. Research suggests that students' academic support plays a vital role at the college level as students often view communication with peers as their primary source of academic support.

Onsongo (2010) in his article titled "Assessing the impact of academic support", states that the communication skills course offered at Witwatersrand University as an academic support programme is primarily designed to improve comprehension in English as well as competence in written and spoken English. He further argues that there are many students who are considered to be "right" candidates for academic support. Johns (2005) argues that higher education institutions expect lecturers to succeed in preparing learners for any rhetorical or linguistic exigency that may arise, to 'fix' students illiteracies once and for all, so that they can get on with the 'real' academic work. She further contends that instructors need to motivate learners to be literacy researchers, open to and prepared for the many social and linguistic forces that may influence their literate lives. The first-test intervention administered by the tracking and monitoring team at WSU flagged learners who fail the test as students-risk of academic failure. Onsongo in conclusion to his argument emphasizes that if the academic support programmes are considered entirely in isolation and assessed on the basis of the number of graduates they produce, the impact would be minimal. However if the programmes are considered an essential part of improving throughputs especially in the pass rate from the first to the second year, then the process of academic monitoring and assessment of all learners throughout the first year has had a remarkable impact.

**METHODOLOGY**

Selected for its relevance to experimental studies, the dominant research design used in this longitudinal study has been the quantitative pre-experimental design. Its use has been to determine the performance of participants by comparing the marks gained before (pre-test) their participation in the academic literacy intervention. The design that has been followed is illustrated below:

**The pre-experimental design**
The quantitative pre-experimental design is the dominant design used in this study because of its relevance and responsiveness. It has been used to determine the performance of participants by comparing the marks gained before (pre-test) their participation in the academic literacy intervention. The design that has been followed as illustrated below;

**Table: 1.1 The pre-experimental design followed in the study**

| Design | Pre-test | Experiment stage | Post-test | Follow-up |
|---|---|---|---|---|
| Pre-experimental | SATAP English test administered to all participants | Introduction of an independent variable (Academic Literacy) | Measuring the dependent variable (retesting) | Measuring the characteristics that were analysed |

The pedagogical experiment in Table1.1 was carried over ten months with the following stages and distinct sequences:

- The pre-test administration
- The pedagogical intervention
- The post-test administration

The pre-experimental design proved advantageous in that it gave the researcher the opportunity to determine the resultant changes after the experiment, by comparing scores from the pre-tests and the post-tests, AllPsych (2004:16). The pre-intervention SATAP test scores were used as the baseline to be compared with the post-intervention scores achieved in the same SATAP tests. However the

disadvantage of a pre-experimental design is the possible increased chance of error, "it cannot establish cause and effect and it has no control of the independent variables. It is also difficult to rule out the rival hypothesis with this design", de Vos (2002:320). Of significance was that the results were important indicators to confirm the researchers' quantitatively derived hypotheses.

**The single-group pre-test-post-test design**
The other effect of the design was evaluated by looking at the change in performance in the SATAP test administered at the beginning of the year and the one administered after the intervention, at the end of the year. The performance of the participants in the two tests was compared as per the research design illustrated below:
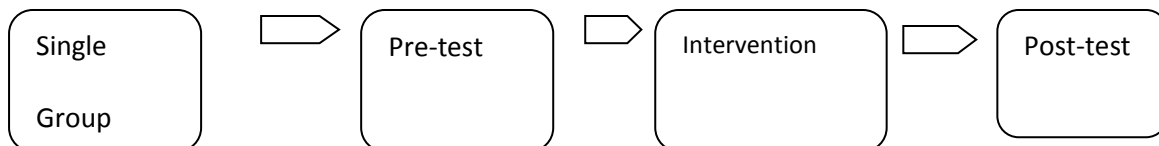
Single Group → Pre-test → Intervention → Post-test

**Figure 1.1 Illustration of the single-group pretest-posttest design**

*Limitations*: The reason for using only a single experimental group thus excluding the use of a control group as would be the case in a quasi-experimental design was due to logistical constraints. Since the research was conducted in a year, therefore it would have been logistically unfair to divide the group into two because the control group would have been deprived of the opportunity to be exposed to the academic literacy programme, which is a prerequisite in their Faculty. In the single-group pretest-posttest study a pre-test had to be included to determine baseline scores. The participants were a group of learners admitted to four Departments that had extended their programmes in the Faculty of Science, Engineering and technology (FSET). The number of participants was the standard quota for the Faculty per SATAP seating in a year. The students who could have been a control group were the students who were admitted straight into the mainstream, but according to admissions policy, these students could not be subjected to SATAP writing.

*Table 1.2 Frequency table of pre-test and post-test scores with percentages*

| Score range | Pre-test | | Post-test | |
|---|---|---|---|---|
| | Frequency | % | Frequency | % |
| < 39 | 85 | 71% | - | - |
| 40 – 49 | 25 | 21% | 8 | 7% |
| 50 – 59 | 10 | 8% | 20 | 17% |
| 60 – 69 | - | - | 30 | 25% |
| 70+ | - | - | 62 | 51% |
| | **120** | **100.0%** | **120** | **100.0%** |

This table indicates the percentage of participant students who obtained scores in the different scoring ranges of the SATAP English Test. It indicates that the percentage scores of students who passed increased from 8% to 93%, thus giving an indication that the intervention had played a very positive role on their SATAP scoring. The score range 70+ increased by 62% which was the most improved range. Thus, in the post intervention test, the highest number of students fa within the 70> score range, indicating a significant improvement in the

performance of the participants. This further indicates that the participants may now be better prepared for the academic rigors of higher education. The 40-49 score range is the only one that showed a decrease of 14 %. Only 7% of the participants in the post-tests fell in the 40-49 range.

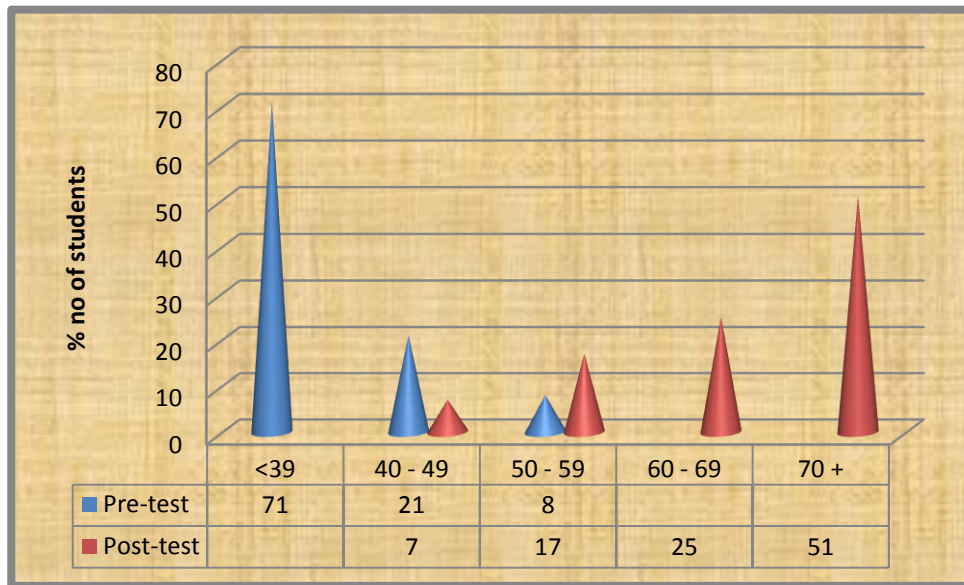The illustration of the distribution of scores is shown in the following Figure.



| | <39 | 40 - 49 | 50 - 59 | 60 - 69 | 70 + |
|---|---|---|---|---|---|
| Pre-test | 71 | 21 | 8 | | |
| Post-test | | 7 | 17 | 25 | 51 |

**Figure 1.2 Bar chart illustrating the pre-test and post-test score ranges received by the 120 participant students**

Findings in Figure 1.2 indicate how the participants scored in the pre-test and post-test. This figure presents the distribution of scores in five score ranges. For the pre-test the study found that 71% (85) of the students scored below 40% in the SATAP English test, 21% (25) of the participants scored in the 40-49 score range and only 8% (10) scored above 50%. This paints a bleak picture for both the throughput and retention rates of the FSET. This could be a result of the discrepancies and inequities in their previous schooling systems. These students may have come from a schooling background that was characterised by under-resourcing, inappropriate approaches to learning and teaching or socio economic inadequacies.

**ANALYSIS AND INTEPRETATION**
In terms of the post-test, all participants scored higher marks than in the pre-intervention tests as depicted in Figure 1.2  51% (62) of the participants scored above 70%, 25% (30) scored in the score range of 60-69, whilst 17% (20) scored in the in 50-59 range. Only 7% (8) scored in the 40-49 score range, below 40. Since data was normally distributed, the paired t-test was used to test the hypothesis whether the means are the same. The hypothesis was:

$$H_o: \quad \mu_d = 0$$

$$H_1: \quad \mu_d \neq 0$$

The following output was obtained.

**Table 1.3 : Hypothesis testing – Paired samples t-test statistics for the building departmental participants**

T-Test

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | Posttest mark as a percentage | 63.8021% | 30 | 9.49176% | 1.73295% |
| | Pretest mark as a percentage | 34.3229% | 30 | 10.02995% | 1.83121% |

**Paired Samples Correlations**

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | Posttest mark as a percentage & Pretest mark as a percentage | 30 | .354 | .055 |

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | | Lower | Upper | | | |
| Pair 1 | Posttest mark as a percentage - Pretest mark as a percentage | 29.47917% | 11.10731% | 2.02791% | 25.33163% | 33.62671% | 14.537 | 29 | .000 |

## 9. FINDINGS

The mean difference (post-test – pre-test) is 29.48. The standard deviation (SD) of the difference is 11.11. The hypothesis gave a **t-value = 14.537** with a **p-value = 0.000**. It is highly significant. Since p-value is less than 0.05, the null hypothesis of mean difference zero was rejected at the 5% level of significance and concluded that there was a statistically significant difference between the means of pre-test and post-test. Since the mean for the post test was greater than the mean for the pre-test, we can conclude there was a change in the pre- and post-test scores, and there is a statistically significant/difference between the means of the building department participants. The 95% confidence interval for the mean difference µd was 25.33 to 33.63. This does not include zero signifying mean differences. It shows that on the average a participant improved by at least 25 marks. Tables and Figures served as visual representation of the scores obtained for the pre and post-tests as well as the percentage increases that occurred when the pre and post-tests marks were compared. According to Table and Figure, all participants received a mark increase between their pre and post-tests varied from -7.81% to a maximum of 54.69%. Some students' marks increased dramatically, especially those who obtained low marks in their pre-tests. The improvement in the post-tests may have been impacted by multiple variables because the students participated in numerous intervention programmes that occurred simultaneously during the year.

## CONCLUSION

With hundreds of variables having an impact on students' performance, the likelihood that one intervention is responsible for the result is unlikely. For instance, these students have been exposed in an English environment for about ten months by the time they write the post-tests. This environment is likely to contribute to their basic interpersonal communications. These students have also had much more experience in university tests by the time they wrote the post-tests. There was likely to be less stress, because the pre-tests were written in the first stressful week at university.

Nonetheless, whether this change would have occurred without the application of the treatment or is an independent variable cannot be claimed categorically. It could also be that the mere maturation by the participants caused the change. Some students' marks increased only slightly, especially those that had a high mark in the pre-tests. It is further notable that the scores for the pre-tests varied much more than those for the post-tests. This does indicate that intervention programmes do have an effect on students' performance.

## RECOMMENDATIONS

The improvement in scores indicates that all students at entry level need to be exposed to tests that will identify their strengths and weaknesses, and assess their academic preparedness, so that the support that is provided for them is tailored to their generic language needs. It is further recommended that all the intervention programmes offered by the CLTD be marketed extensively in all faculties and means to make them easily accessible be devised. It is also recommended that an Academic Literacy policy be instituted where all incoming students will be tested for Academic Literacy skills. Further to the recommendation is that a holistic integrated approach (an asset or developmental approach) as opposed to a deficit approach) currently used by the WSU, be followed by integrating academic support in high risk courses and also in the mainstream curricula route, to the benefit of prepared students.

## FURTHER RESEARCH
The researcher acknowledges the fact that this study in its limitations prompts further and continuous research in the field of evaluating the impact of Academic literacy intervention programmes and how they relate to other interventions such as assessments in order to keep abreast with new developments, and also to keep pace with the most recent definitions and approaches. Kern (2000:23) notes that "Literacy is an elastic concept; its meaning varies according to the disciplinary lens through which one examines it". Any two people will thus seldom hold the same conceptual framework of the term. It therefore needs to be continually revisited. In conclusion, it was evident from the various analyses that students significantly improved their academic literacy skills performance in the tests. This was noticeable in the increase in marks in the post-test scores after the intervention. This identifies Academic Literacy as a beneficial and a worthwhile programme.

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# OBTAINING STUDENT FEEDBACK USING NGT FOR COURSE DELIVERY REDESIGN: A CASE FOR BOTHO UNIVERSITY, MAUN (BOTSWANA)

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## Abstract

Feedback is a very essential tool in achieving quality management in all kinds and forms of business. Tertiary institutions worldwide have adopted various ways of collecting student views about their learning and educational experiences. This study seeks to investigate the impact of NGT in providing new ideas that would make students grasp concepts deeper in Computer Systems Architecture module in the Faculty of Computing at Botho University. A cohort of 120 students enrolled in the first year of a computing degree participated in the activity. The technique explored both qualitative and quantitative components in a structured interaction. The analysis was carried out to evaluate the importance of student feedback in course delivery methods redesign using the NGT technique. The NGT involved individual participants working alone though in formal group settings. This study investigated how NGT is used to extract a pool of views to redesign course delivery based on the input from students. The study further discussed the methodology of implementing the technique to gather ideas on how best to tackle and understand the topics in the CSA module, in preparation for the final examination. It was observed that students play a pivotal role in course delivery methods. It was apparent from the results of this study that the students need to develop a positive learning attitude if they are to grasp module content deeper. Finally, the findings were used to redesign module delivery techniques that best suited the different types of learners amongst the cohort.

**Keywords:** NGT, Feedback, Module, CSA, Structured Interaction, Course Delivery.

## INTRODUCTION

The Nominal Group Technique (NGT) is an interview methodology whereby partakers work together but generate ideas impartially without the influence of anyone (Macphail, 2001). The main objective of adopting the NGT as a mechanism for collecting students' views and suggestions on a module that they were taking is to provide a balanced participation for members of the group that will produce the independent ideas for constructive module understanding. Van deVen and Delbecq (1975), the pioneers of the mechanism, argued that the NGT is a very essential behavior tool that can be used by an organization to directly solve specific problems by coming up with probable solutions or ideas. The technique has proven to have strong practical utility in Higher Education across the globe. Paul and Elder (2002) have noted that this approach is a student centered approach that enables students to sharpen their skills in critical thinking and prepares them for analytic discussion.

Previous research on Botswana tertiary education system has shown that, generally students both in high school hate courses that have a mathematical background (Nyakudya, 2011). As such, when they transit from high school to university or college, the lack of mathematics background has had a negative impact on academic performance in science and engineering courses. It is in the wake of such performance that instructors in tertiary education must constantly evaluate course delivery methods with more of the contributions or ideas coming from the students themselves. Data collected from such evaluations can be used to redesign course delivery methods that improve the student intended learning outcomes.

The NGT has been applied in educational setups to examine various topics. Boudreau, (2000), has looked at the personalities of skilled associate teachers using the NGT. Study by Nelson et al. (2002) investigated homework communication strategies in remedial education using NGT. Similarly, Duggan & Cox (1999) used the same technique to evaluate one-to-one teaching in general practice.

As highlighted above, application of the Nominal Group Technique has been implemented in different platforms. Nelson et al. (2002) used the NGT to rank and evaluate the efficiency and practicability of forty-four prospective approaches generated from a previous study instead of using the technique to generate ideas. In their study, the NGT started at group discussion of each idea. The result of the process uprooted fourteen strategies of the initial forty-four which were viewed as the most efficient and implementable strategies.

Duggan and Cox (1999) merged NGT and focus group research in an effort to build an evaluative tool that was used for measuring the effectiveness of trainers of general practitioner registrars. The activity began with individual idea generation, with participants writing down the qualities of good teaching. Participants then discussed their ideas in pairs and amending them. Finally, each individual voted for the ideas that they felt were the most important and were ranked from highest to lowest then prioritized for action.

Waddell and Stephens (2000) in their study used the NGT allow registered nurses to select topics to be covered in their module. This study followed the same structure as the one used by Duggan and Cox (1999). Interestingly, Waddell and Stephens (2000) stress that the most essential aspect of the NGT is the absorption of the ideas and craves of all the participants, irrespective of their levels of confidence, yet participants were not given the chance to air their ideas until after a later stage, thereby thwarting some potential ideas from being included in the list.


**COMPUTER SYSTEMS ARCHITECTURE**

Computer Systems Architecture (CSA) is a first year second semester module that carries twenty credits of the total course credits. It has mathematics components that include topics such as Boolean algebra, Logic Gates, Registers and Flip-flops. The module is taught via lectures, group discussions and tutorials. Students are assessed on a pass or fail scale. Before students can sit for the final semester examination, they attempt three theory-based internal assessments that measure students' progress and the degree of concept grasping. These three internal assessment grades contribute 10% of the final assessment grade. Students also attempt universal mock and mid-assessment tests which contribute 25% of the final student grade and finally sit for their final examination which has a weightage of 60% including attendance which carries a weightage of 5%.

**BACKGROUND OF NGT**

The NGT was pioneered by Van deVen and Delbecq in 1971 as an evaluation tool intended to investigate students' perceptions on the good and bad aspects of a course. Instructors use different course evaluation methods. The most common tried and tested methods that have been unearthed by literature include surveys, questionnaires, interviews and focus groups. The NGT is a feedback tool that gives out semi-quantitative, rank-ordered data about a group of students' perceptions of the positive and negative aspects of a program (Abdullah and Islam, 2011). The data that is collected through NGT is different from data collected through focus groups and surveys (Alison Dobbie et al, 2004). Surveys obtain data about a course but the survey items are not student-generated, they are built by curriculum designers. Focus groups on the other hand only involve a smaller number of students who do not represent the whole cohort. Also, they tend to have a bias towards vocal

members who influence a group's decisions shutting out quiet members' opinions. Contrary, the NGT allows every member to have an equal say in generating ideas and ranking of items. This is a very effective way of evaluating course needs as it represents the voice of the whole cohort and allows students to be owners of their own content. It is rather a student-focused course evaluation tool that represents the opinions of both vocal and quiet members in the whole cohorts or representative groups of students (Lancaster et al, 2002).

Students were so excited about the opportunity to be involved in providing solutions that can make them improve their knowledge and understand module content better. It is generally argued that students do not have adequate knowledge to contribute to the design of a course delivery method, but our view was different on this hypothesis to some extent. From our experience in this experiment, the ideas that the students generated were very useful in redesigning the approaches for learning the module to understand concepts better.

### RESEARCH OBJECTIVES

The main objectives of study were:

1. To evaluate the importance of student feedback in course delivery methods redesign using the NGT technique.
2. To explore whether there is a correlation between student course feedback and performance.
3. To understand the usefulness of student feedback using NGT in promoting better academic performance
4. To propose an effective model for course delivery redesign.
5. To evaluate the perceptions students have on their own learning in a module.

### RESEARCH QUESTIONS

The study seeks to answer the following questions:
1. Does NGT provide an objective way of obtaining student feedback for course delivery redesign?
2. Will the application help to improve teaching and learning quality?
3. Is there a difference in the ideas generated through NGT and those generated through a questionnaire?
4. What is the perception and reality here?
5. How exactly will the application help with spurring deep learning in students?
6. What is the relationship between student feedback and academic performance?

### CONCEPTUAL FRAMEWORK

The conceptual framework of this study was based on prior research done on using the NGT as an evaluation tool to collect feedback in the education sector. Fig 1 below is a visual representation of the NGT conceptual design used in this study;
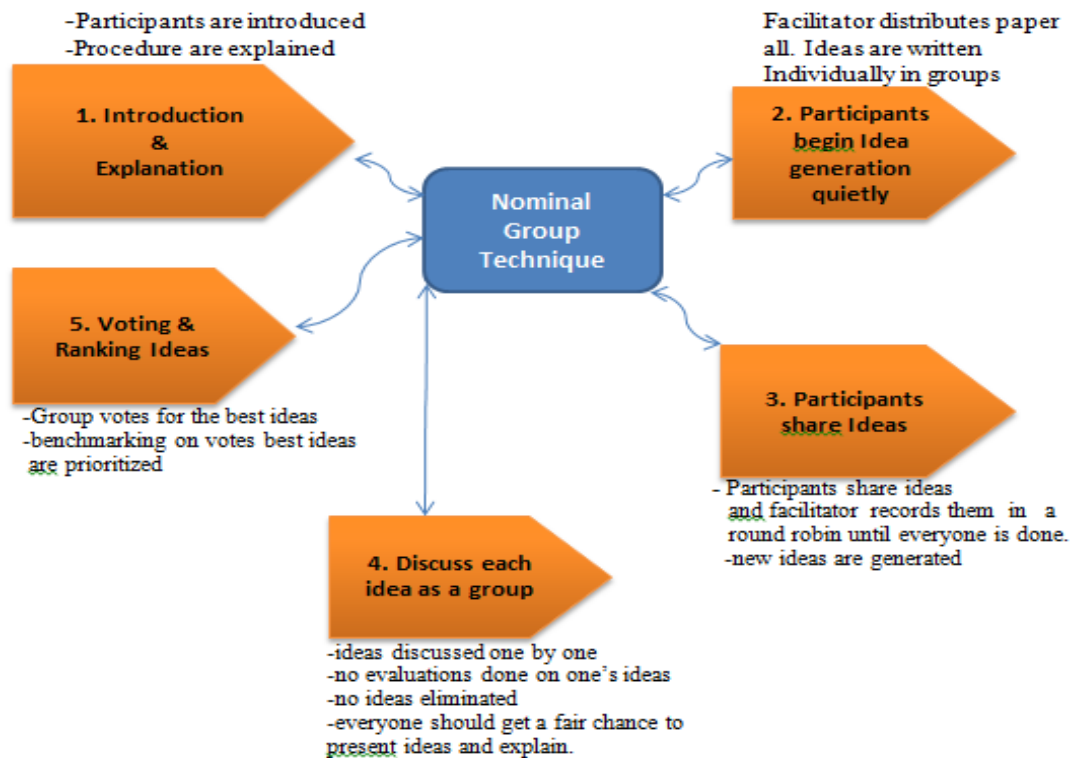
**Fig 1. NGT Conceptual Design**

**RESEARCH DESIGN**

This study incorporated a qualitative research design focusing on presenting ideas on how to redesign course delivery methodologies through student feedback collected using the NGT. The study was a case study for Botho University. The main areas of the design included methodology, ethical considerations, population, data collection instruments, data analysis, sample and sampling techniques, findings and discussion.

**ETHICAL CONSIDERATIONS**

Necessary precautions were taken to protect the rights of all the participants in this study in line with the ethics guidelines of Botho University Research Committee, Botswana ethics guidelines set by Health Research and Development Committee (HRDC) and the Health Research Unit (HRU). On providing research data through NGT, participants were assured that they will remain anonymous in all records.
An empirical research study was carried out that traced students' input through NGT feedback on course delivery redesign. Information for scores and frequency of ideas generated were recorded and rated for prioritization and action.

**METHODOLOGY**

Our study examined the use of the NGT to collect feedback on a course from first year undergraduate students at Botho University. The technique was implemented on a cohort of one hundred and twenty undergraduate students doing a CSA module in their second semester of the BSc Computing degree. Seventy-one (58.3%) were male and fifty (41.7%). Three internal assessment

examinations had been given in three months of learning and summative assessment revealed that students were not grasping the concepts. So, the idea was to gather new opinions on how students can deeply learn the concepts in the module and pass the final examination.

## APPLICATION OF THE NGT

The facilitator provided the students with a problem statement that read, "*Ideas on how to perform better in the CSA module*". The session took hundred and forty minutes with four batches of students being taught the same module by two different instructors. Two batches being taught by the same lecturer were combined with each batch comprising of thirty students making them sixty students per class. They all participated in the activity in groups of six. The exercise was carried out simultaneously on the two combined classes to avoid pre-discussions that might influence ideas to be generated. This technique combined strengths of nominal group, individual and real group decision making. It does this by dividing the process into three phases as follows; individual phase, nominal group phase, real group phase (Burtler, 2003).

Before the engaged in the exercise rules were laid down to help achieve the desired results. Abdullar and Islam (2011) noted that it was important to have rules that ensure a free and fair idea generation session, thereby producing a legitimate outcome of results. In this study the following rules were put forward:

Rule 1: Silence should be observed during the session. Participants were expected to be silent as they generate ideas individually. It was assumed that it would increase concentration and maximize output.

Rule 2: No criticizing anybody's opinion. Criticizing other participants' ideas discouraged further contributions as some participants may fear embarrassment.

Rule 3: There would be unlimited generation of ideas. Participants were encouraged to provide as many ideas as possible. More ideas create a wider pool of solution that will increase the probability of solving a problem.

Rule 4: Evaluation of anyone's opinion is not allowed. No participant was allowed to evaluate anybody's ideas. Those so-called less quality ideas would at the end assist the group in coming up with new or better ideas.

Rule 5: Ideas generated should remain anonymous. It is not important to know who contributed to an idea, but rather we are interested in the idea contributed.

Rule 6: No pre-discussing the problem statement. The idea was to limit the influence of vocal participants on individual opinion. If participants discuss before the session, there is a high chance that some participants will not bring out their original opinion.

Rule 7: Each participant will evaluate the ideas anonymously and vote for the best ideas.

In this experiment, the NGT was implemented using two activities as follows:

ACTIVITY 1
This activity involved two stages of the NGT process:
1. Students individually and independently wrote down five ideas on the problem statement, "*Ideas on how to perform better in the CSA module".* They then listed their ideas in order of priority using 1, 2, 3, etc.
2. In a combined class (*2 batches per class*), in sub-groups of six, each student, in a round-robin, read out his/her ideas with the strongest ideas first. The group members then discussed each idea to ensure mutual understanding of its meaning and remove repeating ideas. Then each group member gave these ideas points out of twenty. This was repeated until all the ideas of the group members were discussed and points awarded. The group then selected ten best ideas out of all the individual ideas which were finally listed on the flipchart.

ACTIVITY 2

This activity used three phases of the NGT:

1. All the groups nominated a group leader who wrote the group's best ten ideas on the flipchart for visibility to the whole class. When all the ideas of all the groups were on the flipcharts, the facilitator initiated open dialogue for the whole class to discuss and make decisions.

2. All students discussed each idea and clarified it.

3. Voting was the final step, where students voted on one idea at a time and ideas were rated, selecting the best six valid ideas that were incorporated in the course delivery redesign for the next lessons. .

## DATA ANALYSIS, RELIABILITY AND VALIDITY

Data analysis from the NGT and presentation of results was carried out using a combination of both qualitative and quantitative methods. To verify data collected, Inductive content analysis (Patton, 1990) was used in the process. This enabled an analysis of individual comments from the cohorts against their individual written comments and data on the flipcharts.

Quantitative analysis of data obtained from the points and rating scales were used to identify best priorities. Delbecq et al (1975) designed a scoring system that occurred in two stages as follows:

- Rating the importance of the top ten items from ten most important items to one least important item.
- Participants points to the top ten items, awarding twenty points to the most important item, with the remaining items being given a point between nineteen and zero.

In summary, the results of the ideas that were generated from the batches and their consolidated factors are shown in the tables below:

**Table 1: Combined Data for Class 1 (*Group 1*) Ideas**

| Suggested Ideas |
| --- |
| 1. Revising before exams with lecturer |
| 2. Doing corrections for past exam papers and internal assessment |
| 3. Prompt feedback on class assignments |
| 4. Solving problems (at least 2 questions in class) |
| 5. Class tests after every end of chapter |
| 6. Forming study groups as students |
| 7. Extra lessons during weekends |
| 8. Reduce Absents from class |
| 9. Avoid doing discussions in local language and use English |
| 10. Block social sites like Facebook to increase study concentration |
| 11. Come to class on time |
| 12. Lecturer should make the class fun |
| 13. Spend more time at the library researching |
| 14. Lecturer must use different teaching styles |
| 15. Lecturer should provide lecture slides to students |

**Table 2: Class 1 (*Group 1*) Top 10 Ideas**

| Suggested Ideas | Score | Frequency |
| --- | --- | --- |

| | | |
|---|---|---|
| Revising before exams with lecturer | 20 | 5 |
| Doing corrections for past exam paper | 20 | 3 |
| Reduce absenteeism from class | 20 | 5 |
| Solving problems (at least 2 questions in class) | 20 | 4 |
| Extra lessons during weekends | 19 | 2 |
| Prompt feedback on class assignments | 17 | 1 |
| Block social sites like Facebook to increase study concentration | 15 | 1 |
| Forming study groups as students | 10 | 5 |
| Class tests after every end of chapter | 10 | 1 |
| Lecturer should make the class fun | 10 | 3 |

**Table 3: Combined Data for Class 2 (*Group 2*) Ideas**

| Suggested Ideas |
|---|
| 1.  Lecturer should be flexible in class |
| 2.  Lecturer should use real life examples |
| 3.  Class should not be too long |
| 4.  Students should have a positive attitude towards learning |
| 5.  Form study groups |
| 6.  Lecturer should discuss answers of internal and mid-assessments |
| 7.  Lecturer should deliver a reasonable pace and audible voice |
| 8.  Class should be exciting |
| 9.  Students should spend more time in college reading after lessons |
| 10. Use the library for researching, frequently |
| 11. Writing own notes during lessons and after |
| 12. Lecturer should provide tests at end of each chapter |
| 13. Attend seminars with peers within the campus |
| 14. Participate in inter-campus seminars on the module to share ideas |
| 15. Variety internal assessments (MOCs, Quizzes, Structured etc.) |

**Table 4: Class 2 (*Group 2*) Top 10 Ideas**

| Suggested Ideas | Score | Frequency |
|---|---|---|

| | | |
|---|---|---|
| Participate in inter-campus seminars on the module to share ideas | 20 | 5 |
| Variety internal assessments (MOCs, Quizzes, Structured etc.) | 20 | 4 |
| Writing own notes during lessons and after | 19 | 4 |
| Students should spend more time in college reading after lessons | 19 | 3 |
| Class should not be too long | 18 | 3 |
| Class should be exciting | 17 | 2 |
| Develop a positive attitude towards learning | 16 | 3 |
| Form study groups | 14 | 5 |
| Lecturer should provide tests at end of each chapter | 12 | 4 |
| Require feedback on their feedback | 10 | 4 |

**Table 5: Consolidated final Ideas from both combined Classes**

| Final Six Ideas | Score | Frequency |
|---|---|---|
| Develop a positive attitude towards learning | 20 | 110 |
| Form study groups amongst themselves | 20 | 100 |
| Develop a culture of reading and taking down notes | 19 | 115 |
| Participate in inter-campus seminars on the module to share ideas | 19 | 113 |
| Require feedback on their feedback | 19 | 100 |
| Block social sites like Facebook to increase study concentration | 18 | 80 |

**BRIEF DISCUSSION OF RESULTS**

From the selected ideas, it is very clear that students play a vital role in improving learning and quality of teaching. Most of the ideas generated had much to do with the students themselves, becoming owners of their learning styles.  Students need to develop a positive attitude towards learning. They need to understand that learning is a process that requires them to adjust their attitudes in terms of emotional intelligence. They should know why they are coming to school. Secondly, students need to form study groups amongst themselves. This creates a platform for constructive interaction with peers in solving complex problems. Thirdly, feedback has to be a two way mechanism where the students need feedback on their own feedback. They should be given the opportunity to say out their opinions and ideas. Fourthly, students need to develop a culture of reading and taking down notes. In this way, they mold themselves into deep learners who research deeper. Fifthly, the institution should arrange for inter-campus seminars that allow students to meet

and discuss issues that they find challenging in a module. Finally, social sites like Facebook, Badoo, Twoo, etc. should only be allowed during the weekend when students are not in class. It has been noted that there has been an abuse of such sites in schools. In as much as they can be very powerful instruments in collaborative learning, literature has revealed a tremendous abuse of such tools. They are not being used for education purposes and it is very difficult to control if not blocked through the domain firewall.

The results of the experiment were quite a surprise as we did not expect such constructive student feedback. Indeed it was a surprise as previous student feedback sessions conducted via student questionnaires yielded only institutional and lecturer negative criticism which would not help the students to enhance their learning and success.

All the students (100%) in the batches participated in generating ideas on how to better understand and grasp concepts in the CSA module. They were very open with their comments and expressed their views in a genuine and relaxed manner. were female. Participant feedback about the module was positive and constructive. Individual and small group works were appreciated and most of the ideas suggested were satisfactory. Students appreciated the exercise of providing feedback using NGT as it allowed them the freedom to express their views individually and in private. Burtler (2003), on supporting the flexibility of this technique highlighted that it creates room for full group participation without professional expertise required, and provides prioritized ideas that can be adopted as solutions.

**REVIEW OF THE NGT FEEDBACK**

The findings from the NGT style of feedback discussed in this study have strong resonance with many schools of thought and literature on student feedback, about course delivery. As identified by this study, feedback can be done in different forms and can be designed by lecturers, from self-assessment and peers (Race, 2008).

A significant finding was that, not all students feedback results in action. Some modules need to be introduced early in the first semester, and then continue into the other semesters. For example, the CSA module has some mathematical components and students felt that it should be introduced in the first semester so that they familiarize themselves with the subject content. The students argued that most of them are not from a mathematical background, so they need more time to understand the concepts of this CSA module which has mathematical components.

Another observation from the feedback was that, students were failing to grasp content because of the language of instructions used in delivering the modules. English is the medium of instruction in Botho University, so students find it difficult to grasp concepts in English. 70% of the students suggested that the modules be taught in their local language and they felt that this would be a solution to understanding course content better. We have also noted that students feedback on a module should be formative. Students have to obtain the result of feedback analysis that will improve their learning style and give them a chance to succeed.

Research by Lilly et al (2007) revealed that providing quality formative feedback to students is very essential as it allows them to strengthen summative assignment. Research has shown that (Black, P., & Wiliam, D, 2009) student feedback tends to focus more on improving teachers and not much is known about the impact of student feedback on the quality of students' learning and on standards achieved.

**NGT vs. BOTHO UNIVERSITY STUDENT QUESTIONNAIRE**.

The result of this study was interesting. Students provided positive and honest feedback as compared to the points that were raised using the Botho University student feedback questionnaire, which were rather not advocating for change in the way students learn the module. From our observation, the main reason for such a difference in the responses was the design of the NGT feedback platform which provides a free, exciting and stimulating environment for students. Hegedus and Rasmussen (1986), Femandez, Rebollosoy and Canton (2007), discovered that NGT develops social interaction, enhances students' satisfaction with the given problem. In contrast, in as much as the Botho University Student Questionnaire (BUSQ) is a good feedback tool, its mechanism is standardized and structured, thereby allowing little flexibility for the students with regards to response format. Questionnaires in general, do not allow freedom of expression as they lack the ability for a student to qualify their answers and freely write down their opinion. As stated by Nayab, (2011), questionnaires do not have room for respondents to provide extra opinion than what is asked for, where some respondents might have some information that is very vital for the purpose feedback is being sort.

In conclusion, we regarded the NGT exercise to have a useful feedback mechanism that can be used in conjunction with the BUSQ. Ideas given by students using NGT to enhance their understanding of the CSA module cultivate the spirit for deep learning.

## LIMITATIONS OF THE STUDY

The study was limited by the following:

> Good ideas could be voted out and would impact on the real purpose of the feedback. It was quite hard to combine ideas at the end of exercise due to indifferences among students on which ideas deserved the first priority.

> Study was limited to only one campus in Botho University. This will not represent the whole student population in the University. All campuses must be represented.
> Maintaining silence. During the idea generation phase individuals are supposed to list ideas individually or in private and in silence. This was quite a challenge as students where whispering to one another, discussing the problem statement. The facilitator had to constantly ensure silence during this phase.

> Another problem was language barrier. Students had difficulty in expressing their ideas in English and thus ended up not expressing ideas as from their original thought.

## DISCUSSION, RECOMMENDATIONS AND CONCLUSION

This study has revealed that learners are responsive to courses that are well organized, instructors who are excited about teaching, material and care about their learning. Lecturers should see students as collaborators in generating ideas that make them understand taught modules better, thereby playing a crucial role in taking responsibility for their own learning. Most students believed that when a lecturer asks for feedback an element of faith and trust is created thereby generating a sense of a learning bond. There is no single act in the classroom that can deliver a message of caring to students other than a lecturer opening up to and taking action on genuine feedback from students. Ideas on course delivery redesign need to be incorporated so that students feel being part of the learning process, but not every idea suggested by the students will be taken.
Of course, it is quite important to review students' suggestions and ideas carefully and where appropriate, perform mid module alterations to address their needs. As pointed out by Richards

(2001), change is quite complex in nature. Similarly, Bailey (1992) and Jackson (1992*)* state that change can point to a number of things like knowledge, attitudes, beliefs, teaching practices and self-awareness.

To take account of the feedback received from students during the NGT exercise, the following changes in the course delivery approach are recommended:

Giving a test early in the semester, return it to students and then give them an opportunity to redo the test. This forces them to learn the standards and have a chance to succeed.

Instead of giving a few large tests and assignments, students will be given more smaller and frequent tests. Materials students need to learn will be more manageable.

Bringing in guest speakers to deliver on a particular topic and ask students if they enjoyed and grasped the concepts. This reduces student boredom and they concentrate more on the lesson.

Using a variety of teaching methods. A variation in the teaching methods engages and motivates students.

Providing students with handouts which give CSA module information. This reduces the student pressure of having to take notes and at the same time listen to a lecturer delivering.

Using Wikis for group learning and collaboration. Students are able to use technology in sharing information from anywhere anytime, through the internet.

Overall, the exercise of obtaining feedback was a success and positive. Student feedback was collected using NGT and the findings were communicated back to the students so that the quality of students learning and standards are improved. A research has revealed that we should not only concentrate on assessment patterns in reviews but also review the philosophy of teaching and learning. Institutions of Higher Education should focus on increasing formative feedback. This challenges lecturers to be creative on how to maintain a balanced assessment load for students. Findings like these reported in this study should be informative and help in the construction and provision of support from broader institutional structures.

However, it is quite essential that lecturers accept that it is their responsibility to make the assessment criteria clear and well understood by students for success. As a result of this study, we ought to do further review in future by evaluating how course delivery redesign based on student input has impacted on performance through summative assessment.

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# THE IMPACTS OF MICRO FINANCE BANKS ON ECONOMIC EMPOWERMENT OF SELF-EMPLOYED WOMEN IN LAGOS, NIGERIA: IMPLICATIONS FOR THERAPEUTIC COUNSELLING AND TRAINING

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**Abstract**

This research examined the impact of microfinance banks on economic empowerment of self-employed women in Lagos, Nigeria using survey method with consideration for provision of therapeutic counselling and training. A sample size of fifty respondents was drawn from two different micro finance banks. Non-probabilistic sampling approach was adopted while quota sampling techniques was implemented. Twenty five respondents were selected based on non-probability sampling technique from each of the selected micro finance banks. Chi-square ($X^2$) analysis was used to test all hypotheses at a 0.05 level of significance. Results of analysis show a significant relationship between interest charge on loans by MFIs and the willingness of self-employed women to access loan, equally there was a significant difference in the profit generated by self-employed women when they have access to loan and when they do not. Results also show a significant relationship between mode of retrieval of loan by MFI and the willingness to access loan by the participants. However, there is a lack of or inadequate education and training for borrowers which hitherto are crucial components for the success of microfinance borrowers. The study therefore concludes and recommends that government should ensure proper regulation of the activities of microfinance banks on loan interest. The MFIs should design appropriate loans based on needs of the self-employed women while the field staff should discontinue the overly strict repayment culture. Finally, education and training is recommended to be an integral part of the whole process of borrowing and repayment of loans from the MFIs. Guidance counselling intervention through educational services is seen as a tool to improve microfinance projects by increasing clients' knowledge for resource management, sustainable savings and family/business budgeting.

**Keywords:** Microfinance, Self-employed, Women, Guidance Counselling, Education/Training

## INTRODUCTION

Women constitute a majority in many African populations yet their representative in the formal sector of the economy and government is in minority. This affects the continent which is in need of skills and training at every level of the economy. The shortage of skills has an immediate bearing on poverty, education, unemployment, health and the environment, all targeted in the UN Millennium Development Goals (MDG) embraced by African Governments. One of the eight MDG goals is to promote gender equality and empower women, a clear recognition of the crucial role women have to play in development. Economic rights are only realizable when there is economic empowerment, i.e. having access to and control over the means to make a living on a sustainable and long term basis, and receiving material benefits of this access and control.

Access to financial services has been proven to be a powerful tool to empower the poor. The impact is greatest especially for the poor people when they have access to a broad range of financial

services with which they can invest in income generating and asset, building activities to meet basic needs such as health, education and nutrition. The ability to manage assets helps poor people to gain control of their own future and make greater contribution to national development. Robust national economic growth and development cannot be achieved without putting in place well focused programmes to reduce poverty through empowering the people, by increasing their access to factors of production, especially credit (Hulme and Mosley, 1996; CBN, 2005; World Bank, 2009; Yunus, 2011).

Microfinance refers to the entire flexible structures and processes by which financial services are delivered to micro entrepreneurs and low income population on a sustainable basis. It recognized poor and micro entrepreneurs who are excluded or denied access to financial services on account of their inability to provide tangible assets as collateral for credit facilities (Agbonifoh, 2006; Jamil, 2008). Microfinance can be seen as a supply of loans, savings and other financial services to the poor. It is the practice of delivering those services in a sustainable manner so that poor households will have access to financial services and thereby can build sustainable microenterprise. While microenterprise is a business that is independently owned and operated by its owners and does not meet certain standards of size which in most cases operated as informal business. The three features that distinguish microfinance from other formal financial products are: the smallness of loans advanced and or savings collected, the absence of asset-based collateral, and the implicitly of operations. In order to enhance the flow of financial services to Nigerian rural areas, government has, in the past, initiated a series of publicly-financed micro/rural credit programmes and policies targeted at the poor. Notable among such programmes were the Rural Banking Programme, sectoral allocation of credits, a concessionary interest rate, and the Agricultural Credit Guarantee Scheme (ACGS). Other institutional arrangements were the establishment of the Nigerian Agricultural and Co-operative Bank Limited (NACB), the National Directorate of Employment (NDE), the Nigerian Agricultural Insurance Corporation (NAIC), the Peoples Bank of Nigeria (PBN), the Community Banks (CBs), and the Family Economic Advancement Programme (FEAP). In 2000, Government merged the NACB with the PBN and FEAP to form the Nigerian Agricultural Co-operative and Rural Development Bank Limited (NACRDB) to enhance the provision of finance to the agricultural sector. It also created the National Poverty Eradication Programme (NAPEP) with the mandate of providing financial services to alleviate poverty (CBN 2005). However, most of these institutions were established and are being operated in the urban cities among large scale traders, suppliers but not in the rural areas among the poorest of the poor who could not provide the required collateral. For this reason, the empowerment of low income women could not be achieved for poverty liberation.

Agoawoike (2000) posited that in Nigeria, women contribute tremendously to agricultural output but unfortunately they hardly, benefited from agricultural incentives and innovations. This economic suppression is hinged on existing social and traditional practices which undermine the constitutional provisions on the equality of men and women. Ignorance had hitherto been adduced as the reason for the lack of women participation in agricultural programmes and projects, but research has shown that gender discrimination, more than anything else, has been responsible for this situation. The Department for International Development (DFDI) has advocated financial empowerment of women for poverty reduction. Women have equally been recognized as the major bread-winners especially in the lower class of the society. Hence, if a nation is to address poverty and inequality, it must improve women business as they are often constrained by capital. There is therefore need to invest more in women with direct support from both government and corporate bodies.

Ayu, (1992), in his investigation of access of 600 rural women to facilities in Berom, Plateau State, Nigeria, found out that none of the rural women had direct access to such facilities as fertilizers, pesticides and tractors. They had to get such inputs through their husbands who do not get enough

of such and must satisfy the needs of their own farms, first. It was also discovered that none of the women benefited from government loans because their husbands would either not approve of it or when they do, would take the money from them. Again, the land tenure system permits women only limited (sometimes none at all) access to land ownership and use, an anomaly which the Land Use Decree has not been able to correct.

The small and medium scale entrepreneurs (SME) in Nigeria lack the necessary financial services, especially credit from the commercial banks; this is because they are considered not credit worthy. Consequently, they depend on families, friends and other informal sources for funds to finance their businesses. Successive governments in Nigeria have come up with special programmes targeting the overall development of enterprises among Nigerian Women; one of such is establishment of Agricultural Credit Banks for Better Life Women program (CBN, 2005). Unfortunately, most of the programmes failed to achieve the desired result.  That led to the emergence of microfinance banks aimed at extending credits to microenterprises and encouraging entrepreneurship. The focus on the impact of microfinance on self-employed women in Nigeria can be justified. Available data shows that most Nigerian women who are entrepreneurs suffer from many constraints and restrictions such as lack of access to improved technology and credit, marketing problems, and other issues (Okojie, 2006; Jamil, 2008).

There is evidence corroborating a positive association between microfinance and education through guided counselling and enhanced entrepreneurial skills of women (Gary et al., 2009). Education in general coupled with financial education has been identified to lead to positive behavioural change and entrepreneurial success (Gary et al., 2009).

In Nigeria, both the Federal and State Governments have recognized that provision of micro credits for SMEs is a must to achieve sustainable growth and development.  If this growth strategy is adopted and the latent entrepreneurial capabilities of this large segment of the people is sufficiently stimulated and sustained, then positive multipliers will be felt throughout the country.  In order to give effect to these aspirations, various policies have been instituted over time by the Federal Government to improve women enterprise production capabilities (Iheaduru, 2002; Olaitan, 2006).

The current study aimed at assessing the role of micro-credits on economic empowerment of self-employed women in metropolitan Lagos, Nigeria with focus also on implications for therapeutic counselling and educational services in the overall process of micro credits.

**RESEARCH METHODOLOGY**

For the purpose of this research, survey method was adopted to find out the impact of microfinance banks on economic empowerment of self-employed women in Lagos. The population of study comprised of women saving with microfinance institutions. A sample size of 50 respondents was drawn from two different micro finance banks in Lagos metropolis. Non-probabilistic sampling approach was adopted and quota sampling techniques was implemented. Twenty five (25) respondents were selected from each of the selected micro finance banks. A direct interview was also conducted to ascertain the challenges being faced by the participants in micro financing process in general.

Data collection was through a Likert generated (MLRAW) questionnaire structured into two sections, A and B. Section A elicits information on bio-data while, section B, elicits information from

respondents on the impact of microfinance banks on economic empowerment of self-employed women through accessibility and willingness to obtain loan and mode of loan retrieval.

All data collected were analyzed for both descriptive and inferential statistics with the hypotheses being tested using the Chi-square ($X^2$) method. Through pilot study with ten participants from another bank other than the ones used for this study, the content validity and the reliability of the instrument were adjudged alright with Cronbach alpha of 0.77 obtained as the measure for internal consistency.

## RESULTS AND DISCUSSION

The demographic characteristics of respondents are presented in table 1.

Table 1: Demographic characteristics of the respondents

| S/No | Demographic Characteristics | Frequency | (%) |
|------|-----------------------------|-----------|-----|
| 1 | **EDUCATIONAL QUALIFICATIONS** | | |
| | Graduate | 12 | 24 |
| | Secondary School Certificate | 18 | 36 |
| | Primary School Certificate | 8 | 16 |
| | Others | 12 | 24 |
| 2 | **Age Range (Years)** | | |
| | 18-24 | 23 | 46 |
| | 25-34 | 20 | 40 |
| | 35 and above | 7 | 14 |
| 3 | **Nature Of Work** | | |
| | Trading | 22 | 44 |
| | Artisan | 18 | 36 |
| | Farming | 4 | 8 |
| | Others | 6 | 12 |

However, the mean scores of the five items measuring mode of retrieval of loan and the willingness to access loan ranges between 3.86 and 4.02 with the highest standard deviation of 0.82. Results show that the mean scores for respondents is far above 2.5 which indicate that interest on loans by MFIs has relationship with willingness, profit made, access to loans and retrieval of loans by self-employed women to access the loan. The standard deviation of below 1 shows the homogeneity in the agreement of the respondents

The inferential statistics of Chi-square ($X^2$) was used in testing the three stated hypotheses at a 0.05 level of significance. Hypothesis 1 states that there is no significant relationship between interest charge on loans by MFIs and the willingness of self-employed women to access loan.

Table 2: Chi-square ($X^2$) analysis of relationship between interest charge on loans by MFIs and the willingness of self-employed women to access the loan

| N | Mean | Standard Deviation | Calculated $X^2$ | Critical $X^2$ | Remark |
|---|------|--------------------|------------------|----------------|--------|
| 50 | 4.0 | 0.69 | 30.52 | 21.03 | * |

DF=12, P<0.05; *= significant.

From table 2 the Calculated $X^2$ value of 30.52 is greater than the Critical $X^2$ value of 21.03; hence the null hypothesis one is rejected at 0.05 level of significance. This implies that there is a significant relationship between interest charge on loans by MFIs and the willingness of self-employed women to access the loan.

**Ho₂:** There is no significant difference in the profit generated by self-employed women who have access and who do not have access to loan.

Table 3: Chi-square ($X^2$) analysis on difference in the profit generated by self-employed women when they have access to loan and when they do not

| N | Mean | Standard Deviation | Calculated $X^2$ | Critical $X^2$ | Remark |
|---|------|--------------------|------------------|----------------|--------|
| 50 | 4.04 | 0.77 | 41.68 | 21.03 | * |

DF=12, P< 0.05; * = significant

Table 3 shows that the Calculated $X^2$ value of 41.68 is greater than the Critical $X^2$ value of 21.03; hence the null hypothesis is rejected. This implies that there is a significant difference in the profit generated by self-employed women when they have and when they do not have access to loan.

**H₀₃:** There is no significant relationship between mode of retrieval of loan by MFI and the willingness to access the loan by self-employed women.

Table 4: Chi-square ($X^2$) analysis on relationship between mode of retrieval of loan by MFI and the willingness to access the loan by self employed

| N | Mean | Standard Deviation | Calculated $X^2$ | Critical $X^2$ | Remark |
|---|------|--------------------|------------------|----------------|--------|
| 50 | 3.94 | 0.71 | 65.04 | 21.03 | * |

DF=12, P< 0.05; * = significant

Table 4 shows that the Calculated $X^2$ value of 65.04 is greater that the Critical $X^2$ value of 21.03; hence the null hypothesis three is rejected at 0.05 level of significance. This implies that there is a significant relationship between mode of retrieval of loan by MFI and the willingness to access the loan by self employed women. Hence, when mode of retrieval is stiff and harsh low income self-employed women especially may not be able to access loan for their empowerment.

The results from hypothesis one shows that there is significant relationship between interest charge on loans by MFIs and the willingness of self-employed women to access the loan. The finding agrees with Grameen (2000) who attests that to a great extent there is a close relationship between interest rates and willingness to borrow from MFIs. Although respondents responded positively to items, increase in interest rate may discourage them from MFIs loan. Eighty percent (80%) of the

respondents agreed that the interest charge by their MFIs is competitive and this source of loans is more beneficial and sustainable to the growth of their businesses than other sources available. Notably, 79% of the respondents agreed that the interest on loan is a major criterion to be considered before obtaining a loan from MFI. This is a major reason why most loan seekers find it difficult to obtain loans for new businesses. Though, microfinance banking is women oriented and focused (Yunus, 2011), its practice here in Nigeria is far from this original concept.

The analysis of hypothesis two shows that there is a significant difference in the profit generated by self-employed women when they have access to loan than when they do not have access. The profit of self-employed women was found to have increased after having access to MFIs loans. This finding agrees with Albert (2013) who pointed out that majority of entrepreneurs (88%) that accessed MFIs loans reported increase in sales and profit. The analysis on relationship between mode of retrieval of loan by MFI and the willingness to access the loan by self employed women shows that that there is significant relationship. This is in line with Osaze (1999) who pointed out that the advantage of traditional microfinance over formal financial institutions is the repayment flexibility and adaptability to the peculiar needs of borrowers. He further stressed that flexibility of mode of repayment is the major criterion a woman in business will consider before obtaining a loan from MFI. There is a fundamental assumption that microfinance clients need extensive monitoring and interaction with loan officers in order to benefit from and repay their loans. From the current results, holistic guidance counselling programme such as educational, vocational, personal-social and training for borrowers is inadequate or completely lacking. Education enables individuals to develop entrepreneurial skills. Studies from Sri Lanka and Bolivia show that financial education could lead to positive behavioural pattern change with high ratio of entrepreneurial successes (Gary et al., 2009; Metcalfe et al., 2010). Hence, there is need for financial counselling and educational services to be an integral part of the micro financing process.

**Implications for Financial Counselling and Educational Services**

A large number of women are disabled by the lack of self-confidence and the absence of a feeling of entitlement that is part and parcel of standard female socialization. Women facing these and other such challenges require skilled professional assistance and re-education services. Hence, skilled professional Guidance Counselling initiative should focus on education and training model that will revolve around these three key ideas, entrepreneurship education, loan repayment strategies, and economic/family management. The programme should:

- Take the form of initial training (vocational guidance counselling) before loan application is accepted and disbursed.
- Provide motivational issues and self-esteem exercise. For example, more than one-third of the participants in the study reported struggling with repayment of loans. This resulted into taking actions contrary to their well-being and that of their families e.g. failing to pay their children's school fees and even to purchase textbooks. Give counselling on group lending and connectivity
- Help with business literacy and training
- Put up an interactive educational support services for women on borrowing with gender bias.
- Enhance business skills development e.g. business plan preparation, marketing strategies and book-keeping of sales and profit.

Basic information on differences and similarities between credit unions and banks should be part of the services to be rendered by the counsellor. However, issues on core banking and micro-finance should be referred to banking specialist. Counsellors offering services to women need to be vigilant

so as to help in overcoming the patriarchal mindset in order to liberate completely the few courageous women in the path to freedom.

**CONCLUSION**

Women face a lot of challenges which involve child marriage, money, health, discrimination, access to capital, education, the glass ceiling, violence and so on. It is believed that lack of economic freedom is the root cause of many gender-related problems. The women in SME sector are already crossing a barrier of non-chalant attitude of majority of women to economic matters. This attitude is referred to as "Chinese wall" which women built between themselves and their relationship with money (Özlem, 2014). There is need for encouragement of women because when they are already in business, they know how to invest and also spend responsibly. Women entrepreneurs are keen on impact as well as profit. According to the Harvard Business Review, women have 20% more return on investment with half the capital. MFI and government agencies should give credit to women to boost their business. Micro finance is supposed to be a social business not for profit but to help people out of poverty. However, women's financial empowerment should also focus on therapeutic counselling and educational services with women-centered approach, responding to women's unique needs and perspective which are obviously lacking or not adequately provided for to help them reach their financial goals. Investing in women is essential for economic development and this could have multiplier effects on economic empowerment in the continent.

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**PERCEPTIONS OF SECONDARY SCHOOL STUDENTS TOWARDS THE INCLUSIVE EDUCATION IN IN OYO STATE**

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**Abstract**

The field of special education has witnessed tremendous changes. The trend now is towards inclusion of students with special education needs (SENs) in the regular classroom. This study investigated the attitude of students towards inclusion of students with special education needs in some secondary schools in Oyo State. The research design for the study is descriptive. One hundred and forty eight students in inclusive/ mainstream classrooms were purposively selected for the study. Pearson Correlation Coefficient was used to analyze the data. The study revealed that students would not possibly accommodate the students with special education needs, while the attitude of the regular students towards inclusion of students with special education needs (SENs) is negative. It is recommended that there is need for monitoring of changing social and negative attitude towards students with special education needs to identify and circumvent any return to segregation and eugenic as the norm in most society.

**Introduction**

Before the establishment of special education practices in Nigeria, Nigeria exceptional children were being discriminated against the over years. The attitude towards them was mostly hostile, neglect, inhuman treatment and rejection. These attitudes were large as a result of ignorance, misconception, misinformation and lack of appropriate education. The major problem of the exceptional children in Nigeria is how to make them become an integral part of the society in which they live. On the historical perspective of Nigeria exceptional children, Okeke (1999) stated that the birth of the exceptional children was virtually frowned at in most African countries especially in Nigeria. The frown cannot be divorced from the culturally inherited misconceptions and attitudes towards the exceptional children resulting into devaluing, fearing, and discriminating against them. They have been viewed with a mixture of fear, scorn, misunderstanding and pity. The author affirmed similar attitude towards the exceptional children among the West African countries. The gradual change in attitude portrayed the Nigerian's love and willingness to care and accept the exceptional persons. The change in attitudes apparently brought about the formal initiation of schools for the deaf and the blind. France, Germany and England were at the forefront of initiating the first act of programmes which later spread to the United States of America. The existing programmes for the deaf and blind after the establishment and development of educational programmes for the exceptional children mark the development of special education in Nigeria.

In the early days of special education, there were social classes or schools for each category of disability. But in the last two decades the educational programmes for exceptional children in Nigeria have undergone series of changes. These changes were inevitable since the professionals in special needs education in Nigeria had to keep pace with other professional colleagues elsewhere in the world, especially in the United States of America, United Kingdom, Germany, France and Canada. The dissemination of information about exceptional children in Nigeria started with "segregation". This is a system of education where children with special needs were separated from their able bodies' counterparts for the sake of educating them. Segregations afford the children with

disabilities to live together in the same school, attend classes together under the same specialized teaching methods and facilities.

However, other professionals who viewed this system from another perspective opposed it, claiming that beside its discriminatory tendency, the system failed to recognize that fact that the persons with disabilities are part of the community and the society at large (Hasazi, Johnson, Hazasi, Gordon and Hull, (1989), Heward, (1996), Fciler and Gibson, (1999).  The authors claimed that the children would definitely return to the society after vocational training and, or successfully completion of their education career. This implies that segregation put more restriction and social handicap on the children with disabilities who will become adults in their later years.

Realizing the flaws and shortcomings of segregation, professionals, teachers of persons with disabilities in Nigeria in collaboration with all stake holders in the education of the children with disabilities in Federal and State ministries of education advocated for a change from segregation to some other system that would embrace all categories of children. Therefore, the Federal Government of Nigeria in her National Policy of Education (1997), revised (1981) revised (2004) adopted integration as a replacement for segregation.

Okuoyibo (2001) and Olukotun (2004) described integration as a system of grouping average and able bodied and exceptional children in the same classes of learning environment for the purposes of instruction.  A statement of the said policy declares:
> 'Government has decided that integration is the most realistic form of special education since exceptional children are eventually expected to live in the same society with their able bodied counterparts"

This policy was found to be feasible and viable; the system was able to achieve its goals of bringing together the children with and without disabilities under the same learning environment and conditions. However, this has not been without its attendant problems. Prominent among them are the failure of integration schools to accept all categories of children with disabilities as a matter of right irrespective of the degree and type of disabilities.

Hopefully, by the last decades of the twentieth century, the United Nations Organization in collaboration with one of her organs, the United Nations Education Scientific and Cultural Organization (UNESCO) and allied stakeholders in the education of the children  with disabilities argued in their series of meetings that children with disabilities must be educated in an environment that is not only friendly and accepting to disabled children, but also devoid of any kind of discrimination no matter the state and degree of disability. The rights of all children to equal education without discriminations in the integrated system are affirmed by the following;

1. The United Nations (UN) Convention on the right of the child (1989)
2. The world conference on Education for All which was held in Jointein, Thailand form $5^{th} - 9^{th}$ March, (1990).
3. The United Nations (UN) standard rules on the equalization of opportunities for persons with disability (1993).
4. The UNESCO Salamanca statement (1994) on special needs education.
5. United Nations Convention on the Rights of Persons with Disabilities (2006)

These conventions and policy statements arising from the above deliberation induced a new educational system approach for persons with disabilities.  This is where all categories of exceptional children would be "infused" in the general education and be accepted for full participation in all school curricular activities.

Hence, inclusive education as a stepping-stone over integration is an alternative educational system for the exceptional children where they can be fully engaged into the large society later in their lives. Olukotun (2004) defined inclusive education as the provision of educational services for the exceptional children in schools where non-handicapped peers attend, in age appropriate, general education classes, directly supervised by general education teachers, with special education support hand assistance as determined appropriate through the Individualized Educational Planning Committee, (IEPC). The above definition therefore pictures inclusive education as a system of educating the children with disabilities together with normal students in the regular schools under regular classroom teachers and being assisted by supportive staff as prescribed by the IEPC.

The success of the inclusion movement will be largely determined by the attitudes of those involved; it includes both attitudes of normal student and special need students as well as educational administrator and teachers. Therefore the crux of this study is to examine the attitudes of regular students towards inclusion of special needs counterparts in the school environment.

## Statement of the Problem

The Federal Government of Nigeria in her National Policy on Education (1977) revised (1981) and (2004) makes categorical statements to give concrete meaning to the idea of equalizing educational opportunities for all children with special needs in order that they may fully contribute their quota to the development of the nation; design a diversified and appropriate curriculum for all beneficiaries, and provision of inclusive education or integration of special classes and units into ordinary/schools under the universal Basic Education Scheme (UBE). In line with the policy statement, some regular schools in the country adopted integration which is not inclusive education but a mere deviation from segregation which allows the physically challenged, the blind and visually impaired and the deaf and the hard of hearing students to be included with their able bodied peers. Though, the system was able to achieve its goal of bringing together the special needs individual and their regular students under the same learning environment and conditions, but not in the same classroom as stipulated by the concept of inclusion. Students with special education needs occupy a portion of the school compound in the regular schools. The main concern of the inclusion policy is to place all students with special education needs with regular students with necessary facilities to make teaching and learning effective. In some schools where students with special education needs are placed in regular classrooms the necessary facilities to make teaching and learning effective and successful are not in place.  The attitude of the society towards persons with special education needs have being negative and since students are also an integral part of the society hence this study focused on the perception  of students towards inclusive education in some secondary schools..

## Research Questions
1. What is the perception of regular students towards the inclusion of students with special education needs?
2. What is the perception of students with special education needs towards their inclusion with regular students?
3. What is the level of relationship of regular students with those of students with special education needs?

## Methodology

The research design for this study is descriptive survey.  This method was adopted because of its primary concern was with collection and gathering of information for purpose of analyzing and interpreting the perception of students towards inclusion of student with disabilities. Purposive sampling technique was used to select five mainstreamed/integrated secondary schools in Ibadan.

A random sample of one hundred and forty eight (148) students in inclusive classrooms in secondary schools in Ibadan, Oyo and Ogbomosho participated in the study. Seventy-seven (77) of the students were classified as students with disabilities (46 male and 31 female) and seventy one (71) as regular classroom students (40 male and 31 female).The major instrument use for this study is a structured questionnaire designed to know the perception of students towards inclusive education. A twenty item questionnaire was designed to elicit responses from the respondents. The questionnaire is divided into two parts.  Section A sought the demographic data of the respondents while section B contained specific items to assess student's perception towards the basic principles of inclusion, components to assess their attitudes towards the feasibility of inclusion of different types of disability. The questionnaires were given to respondents in their classrooms and were collected on the spot. The respondents were briefed on the purpose of the study, which is purely academic. However, respondents were given enough time to answer the questionnaire items and efforts were made to explain some of the items for clarification.Pearson correlation coefficient was used to analyze the data collected.

**Presentation of Results**

R.Q 1: What is the perception of regular students towards inclusion of students with special education needs?

Table 1
Perception of regular Student towards Inclusion of Students with special education needs

|  | Pearson Correlation | Perception of regular students towards the inclusion of students with special education needs | Students with special education needs |
|---|---|---|---|
| Perception of regular student Towards their inclusion with students with special education needs | Sig.(2tailed)<br><br>N | 1.000<br><br><br><br>71 | -.303**<br>.009<br><br><br>77 |
| Students with special education needs | Sig. (2 tailed) | -.308**.009<br>71 | 1000<br>77 |

Recall that, the values of the correlation coefficient ranges from -1 to 1. The sign of the correlation coefficient indicates the direction of the relationship (positive or negative).  The absolute value of the correlation coefficient indicates the strength, with larger absolute values indicating stronger relationships.  The correlation coefficients on the main diagonal are always 1.0, because each variable has a perfect positive linear relationship with itself. Correlations above show that the main diagonal is a mirror image of those below. From the result of the analysis carried out, the value of the correlation coefficient is -0.308 indicating that, the perception of regular' student towards inclusion of students with special education needs slightly moves in the opposite direction.  The absolute value of the correlation coefficient is 0.308 indicating that the relationship between these

two variables is weak.  Meaning, the regular student would not possibly accommodate the students with special education needs though they want to be integrated with regular students.

R.Q 2: What is the perception of students with special education needs towards inclusion of regular students?

Table 2: The perception of students with special education needs

|  | Pearson Correlation | Perception of students with special education needs towards their inclusion | Regular Students |
|---|---|---|---|
| Perceptions of students with special education needs | Sig.(2tailed)<br><br>N | 1.000<br><br><br><br>77 | .617<br>.000<br><br>71 |
| Regular Students correlation | Sig. (2 tailed) | .617<br>.000<br>77 | 1000<br>71 |

The correlation table displays Pearson correlation coefficients, significance values, and the number of cases with non-missing values. Pearson correlation coefficients assume the data are normally distributed. The Pearson correlation coefficient is a measure of linear association between two variables. The values of the correlation range from -1 to 1. The sign of the correlation indicates the direction of the relationship (positive or negative). The absolute value of the correlation coefficient indicates the strength with larger absolute values indicating stronger relationships. From the result of the analysis carried out, the value of the correlation coefficient is +0.617 which is closer to +1 indicating that there is a positive correlation between perceptions of students with special education needs towards inclusion with regular students. This shows that the students with special education needs tend to flow in the direction of regular students meaning that the students with special education needs would accommodate the regular students under the same school. The significance of each correlation coefficient is also displayed in the correlation table. The significance level (or p-value) is the probability of obtaining results as extreme as the one observed. If the significance level is very small (less than 0.05), the correlation is significant and the two variables, attitude of students with special education needs towards their inclusion with regular students and the regular students are linearly related.

R.Q 3: What is the level of relationship of regular students with those of students with special education needs?

Table 3: Relationship of regular students with those of students with special education needs

|  | Pearson Correlation | Relation of regular student towards students with special education needs | Relation of students with special education needs towards regular students |
|---|---|---|---|
| Relation of regular | Sig.(2tailed) | 1 | . 009 |

| | | | .499 |
|---|---|---|---|
| student   Correlation towards   students with     special education needs | N | 71 | 54 |
| Relation of students with     special education   needs towards   regular students | Sig. (2 tailed) | .009 .499 54 | 1 58 |

The correlation table display Pearson correlation coefficients, significant values, and the number of cases with non-missing values. Pearson correlation coefficients assume that data are normally distributed. The Pearson correlation coefficient is measure of linear association between two variables. The values of the correlation coefficient range from -1 to 1. The sign of the correlation coefficient indicates that direction of the relationship (positive and negative). The absolute value of the correlation coefficient indicates the strength, with larger absolute values indicating stronger relationships. From the result of the analysis carried out the value of R=0.094 which is closer to zero than to one, indicating that the relationship between the regular student and students with special education needs is weak.

**Discussion**

Based on the research questions used in this study, the findings revealed that the perception of regular students towards inclusion of students with special education needs is negative. This finding contradicts the findings of Avramidis & Nonwich, (2002). Their study revealed that the attitudes of regular students towards inclusion are moderately positive. The findings also revealed that there is significant difference in the attitudes of regular students and students with special education needs towards inclusion. This finding is in contrast to the findings of Hodge, (1998); Amman & Hodge, (2005) &Elliot, (2008). Their study revealed that there is a positive relationship between the attitudes of non-disabled children towards students with special education needs in general and their actual contact with these classmates during the free play that with regular children demonstrating positive attitude interacted more frequently with their peers with special education needs in their preschool classrooms.

Also, the findings revealed that students with special education needs showed positive attitude towards the concept of inclusion. Students with special education needs considered themselves to be at the beach front of the whole issues of inclusion. They professed to like the policy of inclusion more than their regular classroom counterparts. It could be deduced that students with special education needs are more responsive to the concept of inclusive education. It seems that they have just broken out of the closet of segregation that has confined them for decades. Now, they want to be noticed and they want alternative educational policies that suit them best. In fact, they are ready to embrace anything new and promising. This study contradicts the findings of Spraguc & Pennell, (2000) that posited students with special education needs in the inclusion setting tend to engage in less social interactions.

Finally, the study revealed that the materials to teach students with special education needs in regular schools are not adequate. Regular teachers also are not competent enough to teach students

with special education needs. These findings is in consonance with the findings of Okeke (1998 & 2000) that lack of instructional materials, lack of time for individualized instructions and lack of incentive for teachers among others are constraints to effective learning and teaching of the students with special education needs.

## Recommendations

The findings of this study revealed the negative perception of the regular students towards inclusion of students with special education needs which can seriously impede the progress of their inclusion in regular schools. There is need for monitoring of changing social and negative attitudes towards students with special education needs to identity and circumvent any return to segregation and eugenics as the norm in most society.

Also, these attitudes need to be modified as inclusion gains momentum or vice versa, modify inclusion itself to make it more congruent with student's attitudes. These can be done through the development of forum for regular students on special needs education which will increase the regular student's knowledge and awareness about students with special education needs.
Enlightenment programme should also be put in place between regular students and students with special education needs through seminars, picnics, debates, parties, quiz, shows, and sports and so on.

Furthermore, the government should bear the sole responsibility of providing all the necessary teaching equipment in the schools, funding of inclusive education and establishment of more schools with inclusive settings.

Nonetheless, exclusionists should note that the policy does not necessarily mean the end of special education, as Vaidya (1997) points out, it should simply entails the rest of special education with regular education, which will involve a much greater degree of social interaction and relationships. Thus, if social participation and peer relationships are so conducive to students with special education needs learning in inclusion practice. As a result of these positive attitudes, it is likely that regular classroom students will actually help to control the behavioural problems of their special needs peers in an inclusive classroom. Arcena & Murdock, (1997) also agreed that a setting which fosters more social interactions would be much beneficial to the development of special needs students.

Finally, if negative attitudes of regular students are modified, it will indicate that positive social relationships would be informed between regular classroom students and students with special education needs (even those with severe disability) in inclusive classrooms.
Since research findings regarding the topic of inclusion are inconsistent or lacking, more research are needed to further examine the attitude of regular student towards inclusion with a focus on differences between regular student and students with special education needs and related factors. If inclusion is the way of the future in educating students with special education needs then the negative attitudes towards them must change. The placement of all students receiving special needs services would carry a tremendous impact on everyone associated with the field of education. Teachers would be required to make major adjustments if students with special education needs are included in regular classrooms.

## Conclusion

Inclusive education as an alternative educational system for the students with special education needs to be fully integrated into larger society later in live is relatively new in Nigeria. The outcome of this study provides the perception of regular students and students with special education needs towards this trend. It has been discovered that regular students have negative attitude towards this trend while students with special education needs have positive attitude towards their inclusion with regular students. Therefore, if inclusion is the way forward, the three tiers of government that is Federal, State and Local governments should be adequately involved in setting up a functional programme for the implementation of the policy statement of inclusive education as an alternative education for students with special education needs.

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# THE INFLUENCE OF HOME ENVIRONMENT ON SECONDARY SCHOOL STUDENTS' ACADEMIC PERFORMANCE IN FRENCH IN OBUDU LOCAL GOVERNMENT AREA OF CROSS RIVER STATE, NIGERIA

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## Abstract

This study examined the influence of home environment on academic performance of secondary school students in French language using some selected schools in Obudu Local Government Area of Cross River State, Nigeria. One hundred and thirty (130) students and parents were randomly selected from the study area. Questionnaires were used to gather data on gender, age, educational background of parents, socio-economic status of parents and family description. Data was analysed using simple percentage. Also, as hypothesized, academic performance of students is influenced by home environment. The research contends that parental involvement at all grade levels can assist in the academic and behavioural performance of students. Hence, it is suggested that similar research with relevant research methodology should be used in carrying out research in other states of the federation to ascertain the degree of conformity which this research have on the relationship between home environment and academic performance of students in French. Keywords: Home Environment, Academic Performance, Students, French, School.

## Introduction

There have been several studies done within and outside Nigeria on the effects of home environment as well as socio-economic status of parents on the academic achievements of students. Research has found many factors that influence how well a student performs in school and the amount of confidence the students have for themselves. The achievement which students derive from academics is to a large extent a function of heredity and the environment. But sometimes one of these factors would become so dominant that it suppresses the others. The overwhelming influence of either of these factors could result in the child achieving poorly in school. Hence, this stimulates the research to investigate the home environment as a factor contributing to students' academic performance in French language.

This coupled with the current outcry about the falling standard of education has generated alot of controversies. Some blame the teachers for poor performance of students, while others blame the parents forgetting that environment is a factor that has been contributing immensely to students' academic performance. But rather than taking side in the argument of who is to be blamed and perhaps, infinite argument, students low academic performance should be viewed based on the activities of all agents of socialization including the environment. For the purpose of this study and considering the environment as a major factor that influences students' academic performance, we should know that environment comprises biotic and abiotic factors which help to shape the activities of the organism found therein (Eni, 2014). But the word environment is a broad term and for that, we limit it to home environment, where we can effectively illustrate its influence on students' academic performance. It is very important to note that both the school and home environment play a vital role in moulding a child to a level that the society can either accept or reject the child. By home environment we are considering all the sum total of the conditions around the dwelling place of a child and how it helps to influence the child's academic performance whether positively or negatively. The sum total of the conditions include; the family size in terms of number of members, the surroundings, the things provided by the parents for the child, the parents' socio-economic

status, the parents' educational background among other factors. This study therefore seeks to examine the home environmental factors in relation to Junior Secondary Schools students' academic performance in French language in Obudu Local Government Area of Cross River State of Nigeria.

## Statement of the Problem

The current level of educational development in Nigeria notwithstanding, parents generally tend to believe that the child's academic performance in school depends entirely on the teacher who, they thought is supposed to be the child's sole determinant of success. They neglect their duties as parents concerning the child's upbringing and education and now shift all the burden to the teachers who only have about size (6)  hours to spend with children (students) in a day whereas the parents have the remaining eighteen (18) hours to interact with their children. To the researcher, such parents who shy away from the substance of training their children well at home are not doing well and hence the researcher seeks to know if the home environmental factors are among the major determinant of a child's academic performance.

Also the current decline in students' performance in French language as reported by Cross River State Ministry of Education Junior Secondary School result sheet has also indicated that there is a need for investigation into factors affecting learning and achieving well in French language in the state. Hence, this research.

## Objectives of the study

The primary aim of this study was to examine the influence of home environment on student's academic performance. This general aim is expressed in the following specific objectives which are:
1.      Examine parents' educational background and students' academic performance in secondary schools
2.      Examine the correlation between family size and academic performance of students in secondary schools.
3.      Investigate the effects of the socio-economic status of parents on students' academic performance in secondary schools.
4.      Ascertain the provision of school requirements by parents and students' academic performance in secondary school.

## Research Questions

1. Do parents' educational backgrounds have any effect on students' academic performance?
2. To what extent does family size influence students' academic performance?
3. To what extent does parents' socio-economic status influence students' academic Performance?
4. To what extent does provision of school requirements by parents influence students' academic performance?

## Theoretical Framework

The study is predicated on Maslow's theory of human motivation (Maslow 1970). Abraham Maslow is a famous psychologist who developed the theory of motivation in 1954. According to Maslow, there is a hierarchy into which human needs are arranged, psychological needs come first before safety needs followed by social needs and thereafter self-esteem needs and finally self-actualization needs. Maslow opined that as the lower needs become satisfied, they are no longer motivating factors and the higher needs become dominant in a person's behaviour. Should the lower needs not be satisfied, then the majority of a person's activity will probably be at that level and the others will provide little motivation. This means when one need is not met the person will still concentrate on how to achieve it and not paying attention to any other need at that time.

Relating this theory to our study, we notice that if the child's family is economically stable, they are in position to satisfy the basic subsistence needs for love and care/safety, then the child's attention and motivation will shift from this love and care/safety and their performance in school will be on the higher human needs of self-esteem, social recognition as well as self-actualization. This means as the child's need keep growing without being satisfied reduces the motivation of the child's performance in school.

**Literature Review**

According to Udoh (2005), in his study on family size and its effects on students' performance, the family has implications on education in at least two important ways. If the family is large, parents would have some difficulties in coping with the educational requirements of their wards. Financially, it is easier to provide for a few than to provide for many. Literature has equally shown that family size negatively correlates with children's academic achievements and positively correlates with intelligence. This suggest that children who belong to larger families tend to have low Intelligent Quotient (I.Q) than those of smaller families, and children from small family size tend to be more intelligent than children from large families. Parental education has a positive influence on the survival and educational development of their children. The higher the educational level of parents, the higher the survival rate of the children and vice-versa. Parental education according to Effiom (2006) is conceptualized from two approaches; (a) Education provides for overall improvement of the quality of life. (b) Education provides to parents for the present and future wellbeing of their family. In Nigeria, children come from different home backgrounds and the variation in terms of the quality of their homes and locations do not take time to manifest in school setting. Ejue (1997) observed that a child from a deprived home as a result of low socio-economic background of his parents cannot fare along the same lines of school achievements with a child reared in a home full of warmth, security and above average socio-economic status.

According to Wolfe (1985), small family of about three – four members had all the attention they needed for learning especially when their parents are well to do economically. They would be provided with all the required textbooks, storybooks, educational toys, novel, study desk, study board etc. This materials aid the children in studying effectively hence, high academic performance. Isangedighi, 2007, Davis, 2007 and Undie, 2004, all agreed that family size, parental educational backgrounds, parents' socio-economic background and provision of school requirements by parents influence students' academic performance in schools.

**Methodology**

In this study, causal – comparative (ex-post factor) design was adopted (Wolfe 1985). The choice of this design is that causal-comparative research design looks into past causes of events only to find out how they explain and describe the present. The study area is Obudu Local Government Area. A random sampling method was used to select the respondents. A total of 130 respondents were involved in the study drawn from the six (6) randomly selected secondary schools. Primary data for the study were gathered by using structured questionnaires. Secondary data were obtained from existing literature. The statistical tool used for data analysis is simple percentage and independent t-test.

**Result and Discussion**
**Gender Distribution of Respondents;**
Survey data revealed that 55% of the respondents are male while 45% are female.

**Age Distribution of Respondents;**
Findings from the study showed that 64 % of the respondents fell within the age bracket of 10 – 14 years while those from 15 years and above constitute 36%.

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**Educational Status of Parents:**

Hypothesis I

The null hypothesis states that there is no significant influence between parents' educational background and students' academic achievements. This hypothesis which was stated in the null form was analyzed using Pearson Product Moment Correlation Analysis. The result of the analysis is presented in table 1.

**Table 1.An independent t-test table examining the mean (X) difference of parents' educational backgrounds**

| Variables | N | X | SD | T | P-level | df | Cri |
|---|---|---|---|---|---|---|---|
| Parents Educational background | | | | | | | |
| Educated | 62 | 22.4 | 4.9 | 3.91 | 0.05 | 116 | 1.980 |
| Non-educated | 56 | 18.9 | 4.8 | | | | |
| **Total** | **118** | | | | | | |

t = 3.91> 0.05; df = 116;  Cri.t = 1.980

Analysis in the Table 1 indicates that out of 118 respondents that participated in the study, 62 were those who fell within the educated parents while 56 were those whose parent are non-educated. The mean (x) and standard deviation (SD) of the educated were 22.4 and 4.9 respectively, while the mean (x) and standard deviation (SD) of the non-educated parents were 18.9 and 4.8 respectively.

**Family Size:**

Hypothesis II

In its null form hypothesis two states there is no significant influence between family size and students' academic achievements. In this hypothesis the independent variable is the family size. It is categorized into (2-6) persons and (7 and above) persons per house while the dependent variable is students' academic achievements. The values for the two categories for family size were derived from categorizing the scores obtained from item 1 to 6 where the value below the mean (x) values was seen as (2-6) persons per house and above mean (x) values was seen as (7 and above) persons per house. The source of data for the two variables was derived from a four point likert type scale developed and administered by the researcher.

**Table 2.An independent t-test examining the mean (x) difference of family size Variables**

| Variables | N | X | SD | T | P-level | df | Cri |
|---|---|---|---|---|---|---|---|
| Family size: | | | | | | | |
| (a) 2 - 6 | 58 | 21.62 | 2.56 | 2.22 | 0.05 | 116 | 1.980 |
| (b) 7 and above | 60 | 22.62 | 2.15 | | | | |
| **Total** | **118** | | | | | | |

t = 2.22> 0.05; df = 116;  Cri.t = 1.980

Analysis in the Table 2 indicates that out of 118 respondents that participated in the study, 60 were those who fell within the 7 and above persons per house while 58 were those in the 2-6 persons per house. The mean (x) and standard deviation (SD) of the 7 and above persons per house were 22.62 and 2.15 respectively, while the mean (x) and standard deviation (SD) of the 2 – 6 persons per house were 21.62 and 2.56 respectively.

**Parents' Socio-economic Background:**
Hypothesis III
In its null form hypothesis three states there is no significant influence between parents' socio-economic background and students' academic achievements. This analysis which was stated in a null form was analyzed using independent t-test analysis. The result of the analysis is presented in table III.

**Table 3. An independent t-test table examining the mean (x) difference of two socio-economic backgrounds**

| Variables | N | X | SD | T | P-level | df | Cri |
|---|---|---|---|---|---|---|---|
| Parents socio-economic background | | | | | | | |
| (a) Low | 63 | 23.2 | 2.2 | 4.26 | 0.05 | 116 | 1.980 |
| (b) High | 55 | 21.2 | 2.8 | | | | |
| **Total** | **118** | | | | | | |

t = 4.26 > 0.05; df = 116;   Cri.t = 1.980

Analysis in Table 3 indicates that out of 118 respondents that participated in the study, 63 were those who fell within the low socio-economic background. The mean (x) and standard deviation (SD) of the low socio-economic background were 23.2 and 2.2 respectively, while the mean (x) and standard deviation (SD) of the high socio-economic background were 21.2 and 2.8 respectively.

**Provision of School Requirements**
Hypothesis IV
Hypothesis four states that there is no significant influence between provision of school requirements and students' academic achievements. To test the hypothesis, independent t-test analysis was used and the result of the analysis is presented in table four below.

**Table 4. An independent t-test table examining the mean (x) difference of two parents' provision of school requirements**

| Variables | N | X | SD | T | P-level | df | Cri |
|---|---|---|---|---|---|---|---|
| Provision of school requirements | | | | | | | |
| (a) Adequately | 50 | 20.1 | 2.3 | 7.8 | 0.05 | 116 | 1.980 |
| (b) Inadequately | 68 | 23.3 | 2.0 | | | | |
| **Total** | **118** | | | | | | |

t = 7.8 > 0.05; df = 116;   Cri.t = 1.980

Analysis in table 4 indicates that out of 118 respondents that participated in the study, 50 were those who fell within the adequate provision, while 68 were those whose school requirements were inadequately provided. The mean (x) and standard deviation (SD) of the adequately provided were 20.1 and 2.3 respectively, while the mean (x) and standard deviation (SD) of the inadequately provided were 23.3 and 2.0 respectively. Since the calculated t-value (7.8) is greater than the critical value (1.980), hence, the null hypothesis was rejected while the alternative hypothesis which states that there is a significant influence of provision of school requirement by parent on students' academic achievement was upheld.

**Discussion of Findings**
Educational backgrounds of parents greatly influence students' academic achievement in French Language. This is supported by Effiom (2006) who opined that different educational background of

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parents greatly affects students' achievement. Family size also influences students' academic achievement in French Language. The result is in line with the work of Udoh (2005) who stated that students from larger family size do not fare well academically with their contemporaries from smaller family size. Parents' socio-economic background equally influence student's' academic performance the result is in line with Ejue (1997) who opined that a child from a deprived where parents social status is low performs poorly at school. Finally, the study also revealed that provision of school requirements by parents influences students' academic achievements in French language in Obudu Local Government Area. The result is in line with Davis (2007).

## Conclusion

Home environment and students' academic performance is an issue of social and economic importance that needs urgent societal attention in order to save our future generation from the problem of social vices such as crime rate increase, dropout from school, cultism and early death due to poor performance in school. To achieve a rapid transformation in the students' academic performance mostly in French which has already being given as the status of the second official national language parents should be mobilized and encouraged to run a home that gives prominence and attention to high academic performance. Parents should ensure that they provide their wards with the needed care and affection as well as equating it with their academic activities, which will create a friendly home for children to read at home and shun visiting friends for pleasure. Hence, readers of this work should note that home environment effects students' academic performance in French.

## Recommendations

The following recommendations were made based on the findings of this study:

- Government should enact a law that will encourage Parents who were not educated to at least acquire a formal education even though it will be gotten through evening learning. This will enable proper supervision of students' assignment at home by parent.
- Government should also enact a law that will discourage large family size.
- School authorities/Teachers should learn to understand that all children are not from homes of same socio-economic background, some are low while others are high therefore, and different socio-economic backgrounds should be brought into consideration when dealing with students.
- Government should include free education policy and should build in all the materials the students' will need at school in the policy as most parents could not adequately provide their wards with school requirements due to their social status.

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# A STUDY OF CHALLENGES OF SCHOOL SAFETY ACTS AND PROCEDURES IN NORTH WEST PROVINCE IN REPUBLIC OF SOUTH AFRICA

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## Abstract

School safety is the educational right of every learner. Every learner has the right to receive education in a safe and orderly environment. It is the responsibility of every educator to be aware of constitutional laws regarding school safety to avoid legal liability for any damage or injury to the children under their care. The main purpose of the study was to investigate school safety issues and challenges facing schools in the North-West province. Out of the 410 secondary schools in the province, 50 schools were randomly selected for the study. The tool used for the empirical study was questionnaires. From each of the 50 schools selected, 10 respondents were requested to complete the questionnaire. The respondents were the principals, deputy principals, heads of departments and educators. The research design used in the study was a mixed mode approach, both quantitative and qualitative. Data was collected from the randomly selected sample of the population using a questionnaire. Analysis of collected data through questionnaires was done on a Chi-square test of independence. Chi-square test of independence was used to determine the statistically significant difference between different categories of the population. From the findings of the empirical study and literature review, a guideline for school safety was developed which could be used in schools to improve safety and security of learners and educators.

**Keywords:** School safety, abuse, harassment, racism, weapons in schools, vandalism, bullying.

## INTRODUCTION

Schools in many countries are becoming breeding grounds of violence, abuse and crime. Learners and educators do not feel safe and secure in their schools. Mendler & Curwin (2004) argue that all educators realize that there is a serious impact on teaching and learning when learners and educators feel unsafe. Trump (1998) reveals that most educators have not been adequately prepared academically or in practice to deal with school-based crimes and violence. Learning is not effective and interesting when learners are worried about being hurt physically or emotionally or having things they value destroyed or stolen. According to Osher, VanAcker, Morrison, Gable, Dwyer & Quinn (2004) school violence, bullying, harassment-both sexual and racial, are challenging behaviour which constantly confront educators and community leaders. Greene (2001) believes that violence in schools certainly affects learning environment negatively. Not only the actual violence but even the fear of possible violence can be detrimental to the safe environment. A healthy learning environment accommodates the needs of learners. It is characterised by the humane and caring environment which is free from violence, discrimination and intolerance (Neser, 2005).

## STATEMENT OF THE PROBLEM

In this section the researcher intents to study the theoretical aspects of violent behaviour of learners, particularly adolescent learners. Physiological, psychological and social aspects for some of the deviant behaviour of learners were identified from various books and other sources such as internet. Abraham (2006) argues that the following social factors of an individual can influence deviant and violent behaviour in adolescents:

**Social factors**

- Gangs:  One of the major factors which contribute to the violence on schools is gang related activities.

- Television: Children spend more time in watching television than playing sports, reading, creative work or socialising with other children and adults. Those individuals who are predisposed to violent behaviour for whatever reasons, watching violent scenes on television can flare up their impulses.

- Internet: Since internet is not edited, it brings a whole lot of information to the fingertip of every adolescent in his/her room.

- Guns: Fights involving guns cause many fatal injuries among youngsters. Guns are also used in many instances of suicides.

Walker (2000) argues that poverty is one of the social factors which lead to violence in some learners, especially in the poor communities. Some boys and girls involve themselves with gangs and illegal and immoral activities for financial benefit.

**Adolescence and violence:**

Jones (2001) believes that individuals of the age group 12-20 years are most prone to committing violent acts. Adolescent years are often filled with intense emotional struggle, sexual interest, gender identification and relationships. According to Mc Whriter (2004), there are three distinctive pathways of development of disruptive and delinquent behaviour:

- Authority conflict - such as  defiance and disobedience,
- Covert actions- for example lying  and stealing, and
- Overt actions - including delinquency and violent behaviour.

The first two of the above mentioned stages occur in school settings.
Goldstein & Conoley (1997) summarise the following factors as reasons for the culture of violence in youth:
- Racism;
- Abuse;
- Harassment;
- Weapons in schools
- Vandalism and
- Bullying

**Family background and delinquency:**

Divorce, poverty, child abuse drugs, and other social forces interfere with healthy parenting. It has been commonly observed by all those engaged in social work that disturbed and delinquent children tend to come from unstable and stressful families. When the parents do not have a steady income to meet the basic needs of the family, the chances of children resorting to delinquent behaviour is high (Stott, 1982).

**Delinquency and social frustration**

Juvenile crime or juvenile delinquency is the offences committed by children or youths under the age of 18 (Turk, 1999). Juvenile offences typically include delinquent acts, which are acts that would be considered crimes if committed by adults. In South Africa 35,000 young people under the age of 21 are currently awaiting trial or sentenced and imprisoned (Grey, 2005). He further argues that poverty is one of the causes of crime and violence among the young South Africans, because for some of them prison is a place where they are sure to have a meal and a place to stay.

The challenges faced by South African schools are unique. After a mere 20 years of democracy one cannot expect miracles to put things straight .The fact of the matter is that there is still a vast difference between the rich and the poor. Insecurity of the future still haunts many young people in this country. Poverty and unemployment are the major reasons for many children to resort to violent crimes.

**THE PURPOSE OF THIS PAPER**

The goals to be reached in this paper are as stated below:

- To determine the challenges facing schools regarding school safety.
- To explore the reasons for learners' violent and disruptive behaviour in our schools, and
- To develop Acts and procedures to improve safety in schools.

**SIGNIFICANCE OF THIS PAPER**

The researcher gathered information on school safety through a thorough books, journals and internet. The researcher gathered data on different challenges and issues which are specific to South African schools. The guidelines developed by the researcher are expected; hopefully, to provide practical solutions to the school safety issues.

**RESEARCH DESIGN AND METHODOLOGY**

Qualitative and quantitative research paradigms have been utilized to add scope and breadth to the study (Creswell, 2003:215). The quantitative approach according to Maree, (2007:56), requires a large sample than a qualitative approach. This approach was applied through the use of non experimental correlational research design.

**Population and sampling**

The population for the paper was drawn from the primary and the secondary schools of the North West Province. Out of the 410 schools in the province 50 were randomly selected for the study. From each of the fifty randomly selected schools in the North West Province: one principal, one deputy principal, two heads of departments, and six educators were requested to complete the questionnaire. The sample of (n=500) was composed of a total of 10 respondents from each of the 50 randomly selected schools for interviews in the North-West Province.

**Sample**

A sample of 500 respondents was selected to gather information on the challenges and issues of school safety in secondary schools in the North-West province. Table 1.1 below indicates the distribution of the sampled population.

**Table 1.1 Distribution of the sample population.**

| Respondents | Sample population | Percentage |
|---|---|---|
| Principals | 50 | 10 |
| Deputy principals | 50 | 10 |
| Heads of departments | 100 | 20 |
| Educators | 300 | 60 |
| Total | 500 | 100 |

**DATA COLLECTION AND ANALYSIS**

Qualitative research which according to MacMillan and James (2001:396), premise that reality is a social construction was used to gather qualitatively derived data. On the other hand quantitative approach according Leady and Ormrod (2001), is used to answer questions about relationships among measured variables with the purpose of explaining, predicting and controlling phenomena was utilized for collection of quantitative data. The quantitative data was analysed using statistical science software (SPSS) version 19.0 and qualitatively derived data was analysed using critical discourse analysis.

**DELIMITATION OF THE RESEARCH PROJECT**

The paper was limited to investigating what causes schools in the North West Province to be unsafe. Only 410 schools were randomly selected.  Thus, the paper did not cover all the schools in other Provinces. Only 50 respondents were selected. Therefore the outcomes of the research cannot be over generalised. The field of study was challenges of school safety acts and procedures in North West Province in republic of South Africa.

**LITERATURE STUDY**

In this paper, safety is viewed as an environment in a school which provides learners and educators a feeling of safety and security all the time. The school atmosphere must be free of all forms of violence, both physical and emotional. Both the learners and educators must be free from the fear of danger, harm or loss. A sense of self discipline and connectedness between learners and educators must prevail in a safe school climate. The school building and surroundings must be clean, hygienic and must be free of any hazards which can cause injury or accidents. Provision for consent and indemnity and insurance, among others, can help to protect an educator against legal action from parents guardians in the event of an unexpected injury or damage to a learner under his/her care. This paper outlines various legal aspects on school safety.

**OCCUPATIONAL HEALTH AND SAFETY ACT NO. 85 OF 1993**

The governing body, the principal or the educator must determine situations that could be threatening safety and health of the learner on the school premises. According to section 8 (2,i), the department of education, the governing body, the principal and / the educator must enforce precautionary measures deemed necessary to protect the health and safety of all persons in the

school premises under his/her supervision and control. Section 13 (a) states that the employer must see to it that every employee will be informed of all the possible hazards to his / her health and safety attached to the work he / she has to do.

## ALCOHOL AND DRUG ABUSE IN SOUTH AFRICAN SCHOOLS

According to Garbarino (2001), any substance that produces a psychoactive effect is termed as drug. Various forms of drugs available in the public schools of South Africa are: alcohol, tobacco, herbal cigarettes, pharmaceutical drugs, illicit drugs, image and performance enhancing substances and inhalants. Mandrax, dagga, cocaine, inhalants such as glue and thinners are the most commonly found drugs in our public schools from Primary up to Secondary.

## WHAT DRIVES YOUNG PEOPLE TO TAKE DRUGS

There's no single or simple answer to the question of why kids do drugs. The following can be considered as reasons why young people take drugs (RSA, 2002 ©): Hunger, thirst, desire to alter consciousness, divorced parents, lack of parental care, wrong choice of friendship, boredom and affection, lack of education, it is a fashionable thing, curiosity, peer pressure, child neglect, a way to acquire confidence and self esteem, everyone does it, so why not me as well as TV ads that aggressively market drugs as the solution for everything from allergies to sexual dysfunction.

## SIGNS OF DRUGS / SUBSTANCE ABUSE

The following are some signs that may indicate that an adolescent is abusing drugs and alcohol (RSA, 2002 ©): Drop in school achievement, sudden mood swings / changes, unusual aggression, change of friends, loss of interest in sports and hobbies, becoming secretive and lying, tiredness and drowsiness, unexplained loss of money or possessions, unusual smells and stains on the body and clothes, change in appearance, less interest in personal hygiene, weight loss or gain, drug related clothes and jewellery.

## PREVENTION OF DRUGS / ALCOHOL ABUSE

The prevention programme must be able to develop the following skills in the adolescents (Fields, 2001:216-236): Improving self concept, clarifying personal values and ethics, learning effective decision making, communicating about alcohol and drugs with peers, parents and others, being involved in social and interpersonal activities, dealing effectively with feelings of anger, depression and anxiety, developing and exploring ways to alter one's sense of consciousness through alternative activities and provide religious education through Life Orientation as a compulsory subject in schools.

## NATIONAL EDUCATION POLICY ACT NO. 27 OF 1996

Section 3: (4) of the Act expects the National Minister of Education to determine policy to ensure that the health and safety situations at schools are regulated in such a way that the Education Department and educators can be forced to see to the well-being of the education system. Well-being means a state of being well, healthy, contented etc.

## SOUTH AFRICAN SCHOOLS ACT NO.84 OF 1996

Section 15 of the act states that each public school is a juristic person with legal capacity. This implies that the school authorities can be held legally liable in a case where a learner under the care of the school is injured under circumstances where there was no proper policy to protect the learner against the injury. It will therefore be proper for the governing body to assist and advise the principal and staff to develop and implement adequate policy to protect the learners against possible injuries (RSA, 1996 (b). Section 17 (1d) of the Act also prohibits an educator to administer corporal punishment. Chapter 2, section 10(i) and (ii) states that no person may administer corporal punishment at a school to a learner. Any person who contravenes subsection (i) is guilty of an offence and liable on conviction to a sentence, which could be imposed for assault.

## EMPLOYMENT OF EDUCATORS ACT NO. 76 OF 1998

Section 17 and section 18 of the Employment of Educators Act No.76 of 1998 (RSA,1998) states that an educator will be guilty of misconduct when among others he or she is found guilty of:

- Committing an act of sexual assault on a learner, a student or other employee ; 17 (1b),
- Having sexual relationship with a leaner of the school where he or she is teaching / employed; 17 (1c),
- Seriously assaulting, with intention to cause grievous bodily harm to a learner, student or other employee; 17 (1d),
- Illegal possession of an intoxicating or stupefying substance,
- Contravening or failing to comply with this Act or any other legislation relating to education; 18 (1a),
- Disobeying or failing to carry out a lawful order without a just reason; 18 (1i),
- For reason other than incapacity, performing poorly or inadequately; 18 (1l),

## SEXUAL ABUSE AND SEXUAL HARASSMENT IN SOUTH AFRICAN SCHOOLS

In certain areas where the learners come from poor families, educators take advantage of such learners by offering them financial favours, good marks and reports. Some principals and senior management of the school turn blind eye when coming to allegations of sexual abuse of learners by educators. This kind of passive and negligent response by school authorities is a hindrance to creating a safe environment in schools (Abraham, 2006).

Employment of Educators Act 76 of 1998, stipulates punitive measures for educators who are found guilty of sexual offences in schools. Section 17 states that an educator must be dismissed if he or she is found guilty of:

- Committing an act of sexual assault on a learner, student or other employee; 17 (1) (b)
- Having a sexual relationship with a learner of the school where he or she is employed; 17 (1).

## WEAPONS IN SCHOOLS

Kreiner (2000) argued that an important part of solving the problem of weapons in schools is to realize that violence is unacceptable. Learners need to understand that weapons will not solve any problem and that its consequences can be very serious for others and for themselves. The following intervention strategies are suggested to reduce the use of weapons in schools (RSA, 2002 ©):
- Schools must be declared as gun free zones.
- Anonymous boxes and toll free telephone lines must be provided to report information on possession of guns and weapons in schools.
- Adopting a cop and monitoring the success of any intervention programme is important.

## RACISM

Racism means attitudes, practices and other factors that disadvantage people because of their race, colour or ethnicity. Some obvious examples of racism are graffiti, intimidation or physical violence. Racial comments and jokes are other examples. There are three main levels of racism. They are (Miles, 1989):

- Individual racism
  Individual racism takes the form of individual beliefs, values, attitudes and behaviours. Belittling, jealousy, name calling, violence and discrimination in hiring are also example of racist behaviour (Howard, 2005).
- Institutional racism
  Institutional racism is racism which takes the form of customs, rules and standards of organizations including governments. Such institutions or governments unfairly disadvantage people because of their race, colour or ethnicity (Wallace & Carter, 2003).
- Cultural racism
  Cultural racism is the cultural values and standards that disadvantage people because of their race, colour or ethnicity. In this case the educational qualifications or the ability to run the institution efficiently is not given priority over the cultural values and expectations.

## VANDALISM

Vandalism is aggression towards property. The following definition found in the federal Bureau of Investigation report of 1978 seems quite fitting for a school context. "The wilful or malicious destruction, injury, disfigurement, defacement of property without the consent of the owner or person having custody or control by cutting, tearing, braking, marking, painting, drawing, covering with filth, or any such means as may be specified by local law".

Clarke (1992) suggests the following strategies to deal with the physical and social environment which contributes to the act of vandalism:

- Circuit TV and alarm system,
- Access control such as locked gates, doors and fenced yard,
- Toughened glass, strong steel or plastic furniture,
- Formal surveillance by guards and security officers,
- Natural surveillance by pedestrians and neighbours,
- Identifying property such as a mark on a school property with identification numbers,
- Educating children about vandalism costs and its consequences
- Publicity by anti-vandalism advertising,
- Punishment against perpetrators and
- Provision of quality school environment and personal relationship with teachers and improved school-community relationship

## BULLYING IN SCHOOLS

Learners who are bullied may not speak to anyone about it. But educators and parents may look out for certain behaviour of the children which could be happening due to bullying. Some of the behaviour which the parents and educators must look out for are (RSA, 2002 ©):

- Unexplained bruises and physical injuries,
- Being withdrawn,

- Poor performance in school work,
- Becomes distressed and anxious or stop eating,
- Afraid to walk to or from school and
- Reluctant to go to school by giving excuses such as being ill.

The following comprehensive safety plan can be developed by involving all the stakeholders such as learners, educators, school governing bodies and the general community.



## A SOUND SCHOOL SAFETY COMMITTEE
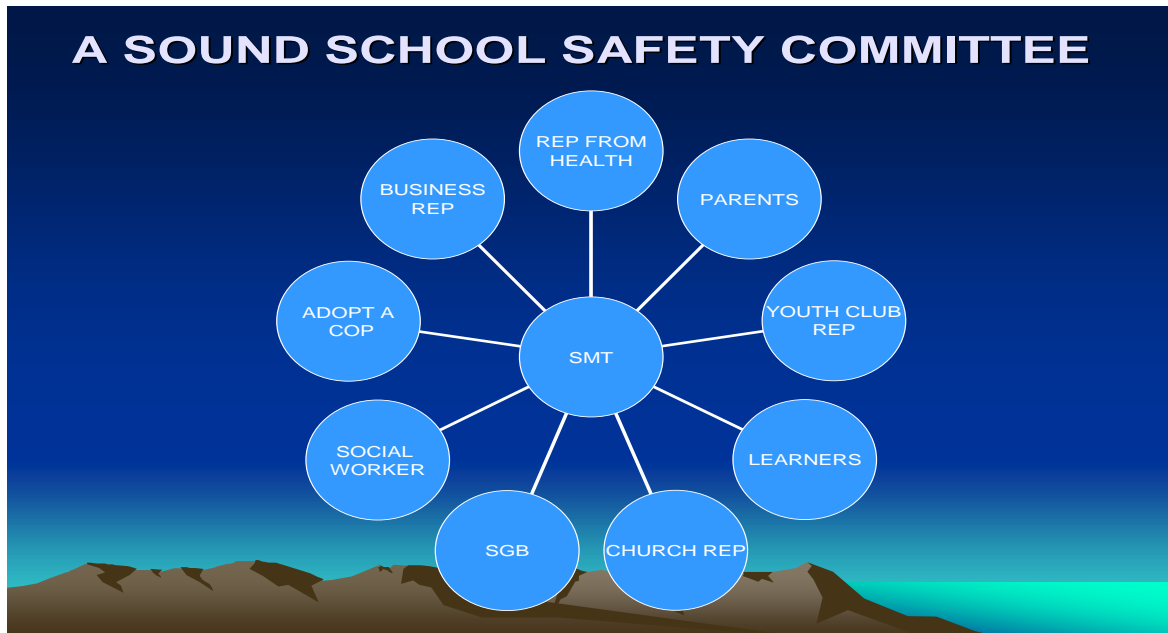
Ngobeni, (2013).

Creating awareness and securing cooperation from all the stakeholders is also important in creating safe school in our community.



## HOW WILL THESE PEOPLE HELP?

- The principal will co-ordinate the selection of the committee members
- The SGB has the responsibility for the smooth governance of the school
- Parents control & monitor the behaviour of learners
- Educators spent more time with the learner
- Any decisions taken without learners involvement will not get support from them
- The school is the mirror of the society because learners carry the culture of the society into schools
- Business people must contribute by supporting needy learners, this will help such learners from selling illegal drugs
- Police officials will educate learners about the results of criminal offences
- Social workers will assist neglected or abused learners
- Youth clubs will help learners to be organized and engage in constructive and healthy activities
- Church leaders can help in providing counseling to emotionally disturbed learners

Ngobeni, (2013).

**SOUTH AFRICAN COUNCIL OF EDUCATORS ACT NO. 31 OF 2000**

The code of conduct expects the teacher to consider the following when dealing with the learners (SACE, 2005), the educator must:

- Respects the dignity, beliefs and rights of learners and the right to their privacy and confidentiality,
- Acknowledges the individuality and needs of each child and guides and encourages them to reach their potential,
- Do his/her best to imbue learners with values consistent with the Bill of Rights in the Constitution
- Be authoritative but companionate,
- Not humiliate learners or have sexual relationship with them,
- Not harass learners sexually or physically,
- Use respectable language and behaviour and acts in a way that will earn respect from learners,
- Take responsible steps to ensure the safety of learners and
- Must not abuse his/her position for financial, political or personal gain.

**FINDINGS AND CRITICAL DISCUSSIONS**

- There is lack of community and parental involvement in the education of learners-There is lack of commitment and involvement on the part of parents and the community;
- The learners are not given sufficient attention by their parents- School safety and security committees are not present in many schools;
- The learners are influenced by their peer group to use drugs and involve in other illegal and criminal activities such as Vandalism, Lack of respect for educators, learners who steal belongings of other learners and incidents of bullying;
- There is no proper system to punish the learners for their misconduct- Problems in urban and rural schools differ considerably. Urban schools face more challenges than rural schools with regard to safety issues;
- Poor financial conditions in the family lead some learners to get involves in criminal activities;
- Some learners are influenced by local gangs and they also abuse alcohol and other drugs;
- There is no connectedness between learners and educators. This causes poor relationship between learners and educators; and
- Lack of well constituted school safety and security committee in many schools as well as a clearly defined disciplinary policy to deal with disruptive behaviour of learners.

**RECOMMENDATIONS**

The Annual Report on School Safety makes the following recommendations on what schools can do to promote school safety (NEA, 2004):

- Provide strong administrative support for assessing and enhancing school safety;

- Redesign the school facility to eliminate dark, secluded, and unsupervised spaces;
- Devise a system for reporting and analysing violent and no criminal incidents should be tolerated;
- Design an effective school discipline policy;
- Build a partnership with local law enforcement officials and/or departments;
- Enlist school security professionals in designing and maintaining the school security system;
- Train school staff in all aspects of violence prevention, and management of violence;
- Provide all students access to school psychologists or counsellors;
- Provide crisis response service in schools;
- Use alternate school settings for educating violent and weapon-carrying students;
- Create a school climate of tolerance among all stakeholders in the schools;
- Provide appropriate educational service regarding school safety to all students;
- Reach out to communities and business sectors to improve the safety of students;
- In line with democratised school governance, actively involve students in making decisions about school policies and programmes, and
- Prepare an annual report on school crime and safety to the relevant District Officials.

## LIMITATIONS OF THE RESEARCH PROJECT

One of the limitations of the study is that only North-West province of South Africa is considered in the paper. Most public schools in the country are facing numerous challenges such as lack of infrastructure facilities, sanitation, clean water, transport, overcrowded classrooms and so on and so forth. Parental involvement in schools is also not up to expectations. These challenges may hamper the implementation of guidelines developed by the researchers. However, attempts were made by publishing a book on school safety and it was difficult to generalize the findings of the investigation because the study is limited to the North-West province.

## RECOMMENDATION FOR FURTHER RESEARCH

A guideline to improve safety in schools is developed by the researcher based on the findings of the empirical investigation and the literature study. Therefore further research may be conducted to study the effectiveness of the programme in different schools. More research is needed in the field of school safety acts and procedures to suit the needs of different communities in South Africa.

## CONCLUSION

Issues and challenges of school safety have a general pattern irrespective of the location of the school. Bullying, drug abuse, sexual abuse, vandalism, and gangs are some of the common challenges in all schools. Schools being the mirrors of the society, most of the problems inside the schools are just a reflection of the culture of the society itself. Therefore any attempt to improve school safety must have full support of the community members.

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# AN "INFORMED" RELIGIOUS EDUCATION CAN CURB SOCIAL ILLS AT LEARNING INSTITUTIONS AND IN THE SOCIETY

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## Abstract

This article argues that school violence, all forms of abuse, bullying, fear, crime and criminal activities, including murder, attempted murder, dealing with drugs, theft, fraud, corruption, satanic rituals, abduction, kidnapping, teenage pregnancy, illegal abortions, absenteeism, lack of respect and lawlessness are just few examples that our society is in crisis. Although religious intervention has been part of the programme in most learning institutions, the approach seemed inefficient, unbalanced, biased or undermined.This article further examines the surveys and study undertaken by various institutions, bodies, and individuals in South Africa and in other countries. Religion on its own is "innocent"; however, the manners in which people perceive and practice it remain a serious challenge. History has proved that religion has played a significant role in all aspects of societies, such as development, education, medication, political, morally and social order. On the other extreme, however, misinformation, misrepresentation, prejudices and intolerance have a negative influence on the notion of religion. This article further argues that an "informed" religious education could address the social ills at learning institutions and in the community at large. Religious Education in the learning institutions curriculum supposed to cater for the spiritual, moral and social development of the learner and society as a whole. To achieve this goal, all stake holders in the community such as parents, learning institutions, faith- based institutions and the government, should be actively involved in the process.

**Keywords:** Religion(s), religious, religion education, learners, morality, tolerance, freedom

## Introduction

Learning institutions, especially schools are perceived to be a place where people, learners, and interested parties feel safe at all times. According to Van der Walt (2010, p. 36), education entails helping the young understand how to care for others and to develop a sense of moral duty and charity. Unfortunately the opposite has been the case. Learning institutions has become a fertile ground for violence, all forms of abuse, bullying, fear, crime and criminal activities, including murder, attempted murder, dealing with drugs, theft, fraud, corruption, satanic rituals, abduction, kidnapping, teenage pregnancy, illegal abortions, absenteeism, lack of respect and lawlessness. School violence is undergirded by a myriad of individual, school, family and broader community-level risk factors that coalesce to create vulnerable for violence (Burton & Leoschut, 2013, p. Xiii; Brend & Corwyn 2001). On the other extreme, the government's failure to maintain law and order in the communities is equally to blame. Any attempt to purge learning institutions and the community from all forms of social ills without the involvement of a well-informed religious education demands re-evaluation. History has proved that religions have always played a significant and decisive role in many societies and historic developments. One is tempted to state that religion and the "subject" of religion has not been properly handled by those who were responsible to educate or indoctrinated. Equally important, the negative perception, misunderstanding and prejudices by the recipients contributed to its negativity. Religion on its own is "innocent"; however, the manners in which people perceive and practice it remain a serious challenge. This article argues that misinformation, misrepresentation, prejudices and intolerance have a negative influence on the notion of religion.

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The moral decay in the society portrayed in rampant fraud, evidence of corruption in high and low places, bribery, stealing and robbery with violence, scandalous nepotism and political patronage and abuse of power, excessive materials and general indiscipline reduced a smooth running of education and life in general (Iheomia, 1995, p.1). A nation's well-being is its *social*, *psychological*, and *spiritual* and *moral* health. Everything else which a nation strives for: such as national integration, political stability, economic development or educational, scientific and technological progress depends on spiritual and moral wellness. South Africa, like many other countries in Africa, is facing morally and spiritually decays. Although religion is a worldwide phenomenon, its nature has attracted two schools of thoughts, namely in favour and those against. The *pro religion* is of the view that religion has a positive impact in the society. The anti religion base their argument on the fact that religion is perceived as root causes of conflict, division, wars, and all other negative aspects. The anti religion further argues that religious leaders (cleric, gurus, etc), by their action or by their silence, have condoned and actively supported many armed conflicts. On the other hand, the *atheists* would not be drawn into something which they are not. With this contrasting, confusing and complexity background, there is a need to re introduce religion and Religious Education in an informed manner. Although most people acknowledge the value of religions in the community, Religious Education and related programmes have been undermined.

*Religion*
The term "religion" is used to describe the comprehensive and fundamental orientation in the world, mostly with regard to ideas of divinity, spiritual and non-secular beliefs and requiring ultimate commitment, including (but not restricted to) organised forms of religion and certain worldviews, as well as being used collectively to refer to those organisations which are established in order to protect and promote these beliefs. There are many facets to every person, and every person needs to be equipped physically, socially, psychologically and spiritually to be able to be a "complete" human beings (Pargament & Sweeney 2011:58). Man does not, and cannot stand alone. He is virtually related with and even dependant on powers in Nature and Society external to him/herself. Religion satisfies human needs, much as food, water, shelter and clothes, basic needs.

*Religious Education*
Religious Education describes a set of curriculum outcomes which define what a pupil (learner) should know about religion. Religious Education in learning institutions is a much contested in modern, democratic societies. Different political, religious and educational histories have resulted in different compromises with regard to religion in education in different national context (Dreyer, 2006, p.41).

*Religious Observances*
Religious observances are those activities and behaviour which recognise and express the views, beliefs and commitments of a particular religion and may include gatherings of adherents, prayer time, dress and diets.

*Religious instruction*
Religious instruction refers to a programme of instruction which is aimed at providing regarding a particular set of religious beliefs with view to promoting adherence thereto.

*Education*
"Education is a fundamental right of each and every child. It is crucial for children's development, enabling them to cultivate their talents and critical thinking, gain life skills, join hands with friends and develop social relations, and grow with dignity, confidence and self-esteem as individual. It has a unique potential to generate an environment where attitudes condoning violence can be changed

and non-violent behaviour can be learned. From children's early years, school are well placed to break patterns of violence and provide skills to communicate, to negotiate and support peaceful solutions to conflicts (Pais, 2009)[1].

**Purpose of the study**

Since the notion of "religion" has been in existence from the time of immemorial to date, any attempt to eradicate or to dismiss it is impossible. Religion has an ameliorative effect on a variety of indicators of well-being such as morality (Rothschild *et al*, 2009, p.914), functional impairment (Musick, 1996, p.221), life satisfaction (Lim & Putnam, 2010, p.914) and depression (Paukert *et al* 2009:103). The purpose of this article is to examine the impact of religions and religious education at learning institutions and in the society at large. The purpose or objectives of this article are therefore summed up in the following points:

- To acknowledge that the population of practically all countries of the world are differentiated into religious grouping (Van der Walt *et al,* 2010, p.30; Vermeer, 2004,p.37).
- To acknowledge the significant role played by religions in political, education, economic, cultural, and social development in most countries including South Africa (Naude, 1991, p.83).
- To examine the impact of religion in the world with special emphasis to South Africa.
- To discourage the negative perception, prejudices, indoctrination, misinformation and mis-presentation of religions/religious education.
- To encourage tolerance, sound /informed religious education at learning institutions and the community at large.
- To sensitize people that religions also have a philanthropic or a caring layer: Greek *philanthropa, philadelphial;* Latin *humanita*, *caritas*, English *love of humanity*, *brotherly love*, *charity*) adherence of a particular faith to promote (Van der Walt *et al,* 2013, p.36).
- To clearly distinguish policy distinguishes between three different aspects with regard to religion and religion  education, religious instruction and religious observance

The article further emphasises that a well informed religious education can curb social ills at learning institutions and the society. Teaching about religion is an educational responsibility in public education, but religious nurture should be provided by the home, family and religious community (Dreyer, 2006, p.41). The curriculum of Religious Education at learning institutions every country supposed to cater for the spiritual, moral and social development of the learner and society as a whole.

**Methodology**

**Comparative and Analytic approach of surveys on Religion Education in South Africa and in other countries**

In this article, a comparative and an analytical approach are used as methodology.Comparative method is an old mode of research, widely use within fields of scientific inquiry (Mills, Bunt & Bruijn, 2006.  p. 619; Heidenheimer, *et al,* 1983:505). It is a scientific method that refers here to research approach in which two or more cases are explicitly contrasted to each other regarding aspecific phenomenonor along a certain dimension, in order to explore parallels and differences among the cases (Azarian, 2011, p.113). On the other hand, analytical research is a type of research that utilises critical thinking to find out facts about a given topic and from the answers obtained develop new and useful ways of doing things. In content analysis, researchers examine artefacts of social

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[1]  Martha Santos Pais is the special representative of the Secretary-General on Violence against children as an independent global advocate for the prevent and elimination  of all forms of violence against children

communication, typically, these are written document or transcription of recorded verbal communication (Holsti, 1968, p. 608).

**Surveys/study on Religious Education in other countries**

Religious Education in learning institutions is a much contested in modern, democratic societies. Different political, religious and educational histories have resulted in different compromises with regard to religion in education in different national context (Dreyer, 2006, p.41). In this article, both approaches are used to compare and analyse the surveys undertaken by various institutions or bodies and individuals in other countries, such as: the North Carolina Council of Churches and the study by Wilfrida Arnolda Itolondo on "the role and status of Christian Religious in the School Curriculum in Kenya (Itolondo 2012, p.721-729).

**A policy statement adopted by the House of Delegates of the North Carolina Council of Churches, May 7 1998**

The role of religion in education is a controversial topic in many countries around the globe today. In North America and Europe the discussion about religious education aims around the balancing between an individual's freedoms to be religious and the need for education to be secular and unbiased (Megal Hallbrook, 2013). Part of the reason for this is that education system is complex with many different agents at the local, state, and federal level involved in the process. The other reason is that the US education seeks to serve the entire country, an incredibly diverse population with values and ideas of justice and morality (Megal Hallbrook, September 2013). The debate in North Carolina serves as an example on the subject. The North Carolina Council of Churches was prompted to examine the role of religion in the public education. The study was based on the continuous disagreements about the proper role of religion in public schools divided local communities and fuel national controversies (cf. Owens, 2003). Battles have been fought across North Carolina and the United States over the celebration of religious holidays; sex education, Bible courses, evolution and creationism (cf. Witte, 2000). The outcome of those battles has been suspicious, hostility and, in many places, bitter school board elections and lawsuits. Public opinion has been polarized as a result of overly simplistic journalism and, as special interest groups demonize their opponents, to raise money for their electoral and legal battles. The intervention of the court and other stakeholders [2] assisted in reaching a new consensus at the national level although not widely appreciated. The consensus was affirmed by President Bill Clinton in his July, 1995, memorandum on religion and public education.  The Religious Liberty Clauses was regarded as important.

Anumber of consensuses, including The Religious Liberty Clauses, The Free Exercises[3] Clauses, The Religious Freedom Restoration Act, have been attempted in an effort to address the crisis.After much debate and confrontations, a new consensus was reached that public schools must remain neutral in matter of religion. Public schools may neither practise nor promote religion. In his address however, President Clinton stated that public schools are not "religion-free zones". Even in the absence of the RFRA, schools can and should, within broad limits, accommodate the free exercise

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[2] The consensus was grounded in the court rulings, the Williamsburg Charter, and a number of documents that have been endorsed by a wide range of national religious and educational organisations.

[3]It means that the government- and, therefore, public schools- may not burden a citizen's

(student') free exercise of religion unless it has a "compelling" reason for doing so.

rights of children to practise their religion and to be exempted from school activities that burden their conscience. Equally important, the neutrality required of schools by the Establishment Clauses does not prohibit teaching about religion. In a statement of New Consensus entitles *Religion and the Public School Curriculum: Questions and Answers*, seventeen national organisations[4], agreed about the importance of religion in the curriculum, and teaching method.

Because religion plays significant roles in history and society, study about religion is essential to understanding both the national and the world. Omission of facts about religion can give students the false impression that the religious life of human is insignificant or unimportant. Failure to understand event the basic symbols, practices, and concepts of the various religious make much of history, literature, art, and contemporary life unintelligible.

**A study by Wifrida Arnodah Itolondo on the role and status of Christian Religious Education in the school curriculum in Kenya**

Itolono's survey was conducted in one of the educational zones of Nairobi province to determine views about the role and status of Christian Religious Education in the school curriculum in Kenya in 2012 (Itolondo, 2012, p.724). Three hundred and one respondents, comprising of fourteen Christian Religious Education (CRE) teacher and 287 Form three students from eight secondary schools were used to provide information (Itolondo 2012, p. 724). The research was aimed at determining views about the role and status of Christian Religious Education (CRE) in the school curriculum in Kenya in relation to the prevailing social and normal issues in the country. Three main religions traditions have been identified in Kenya (Itolondo, 2012, p.721).These religions are Indigenous ethnic religious traditions, Foreign ethnic religious traditions, and Foreign extended religious (Ochieng, 1990). Indigenous ethnic religious traditions were as diverse as the ethnic groups in Kenya (Sifuna, 1990).

Itolondo (2012) emphasised that religion and education in Kenya were inseparable. Each ethnic community had its own religious beliefs and practises. Indigenous ethnic religious education is not handled as an independent subject of the primary and secondary schools' curriculum in Kenya. Some of its content is integrated with subjects like Christian Religious Education (CRE), History and Literature (Itolondo, 2012). The missionaries realized that it was impossible to evangelize without teaching Africans how to read and write. They therefore established schools which they use as a vehicle to evangelization and spread Western civilization (Ocheing, 1990). This was the beginning of Christianity and formal education in Kenya. Christian Religious Education was known by different names at that time and became one of the key subjects in the school curriculum. To ensure its success in achieving the intended objective of evangelisation, it was taught by identified persons with good morals and practising Christianity (Itolondo, 2012, p.721).

Itolondo further stated there has always a closes link between religion and education. Although education in Kenya varied from one community to another, the goals were almost the same. Indigenous African Education was for living. It was concerned with the systematic socialization of opinions of the wider society, practical life skills and the acquisition of knowledge which was useful to the individual and society as a whole (Itolondo, 2012, p.721). Religious and Education could not be separated (Sifuna, 1990). The description is a reflection of Mbiti (1969) who expresses the difficulty in trying to define religion in African context.

The results revealed that Christian Religious Education is one of the subjects of the school curriculum that is expected to cater for learning in the effective domain. However, when career and employment  opportunities are pegged on good performance in other subjects and at  the same

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[4]  These organisations included the American Jewish Congress, the Islamic Society of America, the National Association of Evangelicals, the National Council of Churches, and the major national education of organizations.

proper systems have been put in place to evaluate if learning actually takes place in the affective domain, chances are that of CRE may not go beyond the cognitive domain(Itolondo 2012, p. 724). The *government's* lukewarm attitude toward CRE and other social sciences, while at the same time emphasises on Mathematics and the pure Science, has been identified as a major obstacles to the implementation of CRE (Itolondo 2012, p. 724). The government undermines the implementation of CRE in the as it put greater emphasis on Mathematics and Science subjects. The failure to give CRE teachers incentives such as seminars, in-service course, recognition, giving extra allowances to Science, Mathematics and Language teachers, failing to make CRE a pre-requisite to join higher institutions for learning had a negative impact in individual development and the society as a whole.*Parents and the Churches*are equally to blame for the being responsible for the decline in the number of students offering CRE at the university in various ways: emphasises on the sciences and mathematics, which undermines the social sciences, failure to motivate, CRE teachers, the government policy on remuneration and employment of secondary school teachers (Itolondo 2012, p.727).

**Religious Education in South Africa**
**Stages of Religious Education**
The history of religion and religion education in South Africa can be discussed in three different periods, namely, pre-colonial, colonial, apartheid and the democratic. An attempt to discuss each one of these periods would is not possible in this article. The brief information provided here is to link the narrative better.

The ***pre-colonial period:*** Religion and politics were inextricably interwoven as soon as the Portuguese navigator Bartholomeu Dias (Diaz) erected a limestone pillar and Christian cross at the Cape of Good Hope in the year A.D. 1488. Years later, the arrival of Jan Van Reebeeck in the Cape paved the beginning of civilisation in South Africa (cf. Van der Walt *et al*, 2010, p.31). It should be known that there has been always a close link between religion and education in South Africa, including Africa (cf. Itolondo, 2012, p.722). In the pre-colonial period, religion and politics were inseparable, chiefs were politically and earthly with spiritual functions (Sebola, 2013, p.314). The

***Colonial period***: Colonialism has brought modernisation in Africa including South Africa. Modernasation was introduced through aspects of industrialisation and urbanisation. Agricultural, economic, education, medication, engineering, science and technology are few examples their positive impact (Sebola, 2013, p.315). In the process of modernisation, the missionaries promoted European and Western values. Many missionaries mistakenly believed that southern Africans had no religion because of the differences in their faiths. Africans often denied the existence of a single, Supreme Being who could be influenced by prayer on behalf of humans (Williams, 1987, p.1ff).

***Apartheid period:*** Since the arrival of missionaries in Africa, including South Africa, Christianity has been a pre-dominant religion. As a results, Religious Education at schools, is perceived by Dreyer (2006, p.41) as the most important area in which the complex intersection of the histories of religion, politics and education becomes visible. Christianity was used for state purpose. During the apartheid period a policy of National Education was enforced (Dreyer, 2006, p.41). Certain section of Christianity, Calvinism, was promoted in education and in religious education. Religious Education was influenced by exclusive Christian confessionalism and triumphalism (Venter & Vester, 1986, p.79ff). Learners were compelled to embrace prescribed religious convictions and a truimphalism that explicitly denounces adherents of other religion (Dreyer, 2006, p.41). The ideology of missionary education emphasised a culture of submissiveness to the church and political authorities (Behr, 1988, p.97). Missionary education was perceived to have fostered among African children culture.

Although South Africa has been a multi-religious country, the Apartheid government promoted only one strand of Christianity and the other hand, the church and theology legitimize the regime.

***The democratic period:*** Democracy in South Africa was preceded by the period of transition. The transition process has been characterised as transition by trans-placement (Nel, 1995, p.85). The adoption of the New Constitution (Act 108 of 1996) of South Africa in 1996, with its Bill of Right, implied a total change for all spheres of the South African society (Dreyer, 2013, p.41). The Constitution of South Africa (1996) provide for citizens to have freedom of expression and association with regard to their religious beliefs. The Constitution further states that these religious activities may be carried at government institutions, subject to certain conditions (Joubert & Grobler 2013:2). Government policy in general has adopted a "co-operated model" for relations between the many religions and the state instead of arrangements based on theocratic establishment, anti-religious antagonism, or strict separations (Chidester, 2002:1).

**The National Policy on Religion and Education in South Africa**
The policy of the role of religion in education flows directly from the Constitutional values of citizenship, human right, equality, freedom from discrimination, and freedom for conscience, religion, thought, belief, and opinion. By enshrining these basic values, the Constitution provides the framework for determining the relationship between religion and education in a democratic society.

The Policy for Religious and Education is the results of many years of research and consultations (Dreyer, 2006, p.42). This commenced with the National Education Policy Investigation of early 1990s, was taken further in the National Education and Training Forum during the transitional period of 1993-1994, and in the extensive consultations around the South African Schools Act, prior 1996. It was further developed by the Ministerial Committee on Religious Education in 1999, and the Standing Advisory Committee on Religion and Established for these purposes in 2000. The reviewing the progress made in all of this work, we see an emerging consensus about the relationship between relation and education (Department of Education, 2003). The policy links religion and education with new initiatives in cultural rebirth, moral regeneration, and the promotion of values in schools. Religion can play a significant role in preserving our heritage, respecting our diversity, and building a future based on progressive values. To achieve these goals, the relationship between religion and education must be

**The Statics of the 2000/2001 census in South Africa**
The statics of the 2000/2001 census conducted in South Africa by the HSRC. The rapid increase in the number of new religious movements in Southern Africa, especially in South Africa, has attracted the attention of academics not only in the country but abroad (Oosthuizen 1990:4). The findings of the research or survey revealed that South Africa is a religious country. The census indicated that that the majority of South Africans regard Christianity as their religion (79.8%), although the percentage varies from one research to the other, Christianity is the largest in the country. Islam, is 2%, Hindu, 1, 5 and 28% of indigenous beliefs and animist (Van der Walt & Potgitier 2010:31).

**Survey by the South African Police Services**
The religious survey conducted by SAPS during the 2008/2009. Since South Africa is a multi- religious country, the authorities of the South African Polices requested the Spiritual Service, sub-component of Employee Health and Wellness (EHW), to conduct a research regarding the different religions practised by employees of the organisation(cf. Grobler 2009 & Maree:3). Therefore a research regarding the different religions in the South African Police Services was conducted to all the members during the year 2008/2009. There might be a variety of reasons that led for the religious survey to be conducted. Whatever those reasons might be, the role of religions and its relevance to employees of the organisation cannot be ruled out. The findings of the research concluded that "the

majority of SAPS employees had strong opinion about the fact that religion is very important to them and plays a motivational role in the workplace. The result of the study also indicate that, should the employees of the SAPS be actively and positively involved in religious activities, it contribute to the fact that the spiritual dimension of the employees as human beings is enhanced, which further contribute to more effective and efficient work production and even harmony in the workplace. In short the outcome of the study is that the SAPS employees indicated that religion in their wellness (Joubert & Grobler 2013:9).

**The National Survey on School Violence in South Africa**
History has proved that learning institutions, schools in particular, have become the second most important socialising mechanism after the home (South African Council of Educators, 2011, p.4). By nature, school policies and code of conduct were designed to impede the use of drugs or any intoxicating substance, the carrying of weapons or any sharp objects, the use of violent or vulgar language, and also to discourage threats against persons or their property (Mncube & Harber 2013, p.vii). The term "violence" is offensive on its own, and has been defined in various ways. It is defined as behaviour by people against people liable to cause physical or psychological harm. Zulu *et al*. (2004:70) defined it as any behaviour of learners, educators, administrators or non-school persons, attempting to inflict injury on another person or to damage school property. Internationally, violence both affects schools and is perpetuated and perpetrated by schools (Harber, 2004; Pinheiro, 2006; PLAN, 2008; Smith & Vaux, 2003). Violence in schools can come from different sources, take on many forms and involve different actors. According to the World Health Organisation (2002, p.5), violence is the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood or resulting in injury, death, psychological harm, mal-development or deprivation (WHO 2002:5). This scourge of violence in South Africa prompted the Centre for Justice and Crime Prevention to do a survey on School Violence (Burton & Leoschut, 2013, p. xi). In 2008, the survey was influenced by the absence of any nationally reprehensive data on the extent and nature of school violence in South Africa. The study collected data from both primary and secondary schools in all nine provinces of South Africa (Burton & Leoschut, 2013, p.2). A second sweep focusing on secondary schools was taken in 2012 (SACE, 2011, p.3). The monograph documents by Burton & Leoschut (2013, p.xi) provides a picture of the current state of violence in South African School. The document further attempted to evaluate if any progress has been made in addressing the scourge of school violent in the country. The findings of the study reveals that school violence is undergirded by a myriad of individual, school, family and broader community-level risks factors that coalesce to create vulnerability for violence (Burton & Leoschut, 2013, p.xii).

**Results**
The above mentioned surveys or studies clearly indicate that religion has a special place in human beings. Human beings are a religious being. Like in many countries in Africa, Christian missionaries came to evangelize Africans. As a result, Christianity became the pre-dominant missionary religion in Kenya. The arrival of Missionaries brought about modern civilisation including education, religions, and religious education. Religious education has been viewed as one of the means to restore moral and social order in the society. Many countries are trying to maintain religious ideals under the umbrella of what is known as religious studies (Itolondo, 2012, p.721). The findings of the study reveals that school violence is undergirded by a myriad of individual, school, family and broader community-level risks factors that coalesce to create vulnerability for violence (Burton & Leoschut, 2013, p.xii).

The government's lukewarm attitude toward CRE and other social sciences, while at the same time emphasises on Mathematics and the pure Science, has been identified as a major obstacles to the

implementation of CRE (Itolondo 2012, p. 724). The government undermines the implementation of CRE in the as it put greater emphasis on Mathematics and Science subjects. The failure to give CRE teachers incentives such as seminars, in-service course, recognition, giving extra allowances to Science, Mathematics and Language teachers, failing to make CRE a pre-requisite to join higher institutions for learning had a negative impact in individual development and the society as a whole. Parents and the Churches are equally to blame for the being responsible for the decline in the number of students offering CRE at the university in various ways: emphasises on the sciences and mathematics, which undermines the social sciences, failure to motivate, CRE teachers, the government policy on remuneration and employment of secondary school teachers. The church on its part has been blamed for not asserting its authority as a key stakeholder in the education sector in Kenya and also and not being concerned about CRE teachers. Parents also play some role in the decline of number of students offering CRE at the university; their influence seems to be quite minimal. NB: The whole world is concerned with technological advancement and industrialization. Kenya is not left behind in that endeavour (Itolondo 2012, p.727). Christian Religious Education is one of the subjects that deals with of the society and that is why it is challenges affecting the society and that is why it is imperative that teachers are acquainted with those issues not only through books and mass media but through interactive forums such as seminars and workshops(Itolondo 2012, p. 727).

It can therefore be argued that the high levels of violence and crime taking place within South African schools is robbing children/learners of the opportunity of being able to reach their optimal academic and educational potential. Secondly, as stressed in international studies there is a strong correlation between the amount of education as well as academic success a learner achieves and their decision to choose crime or not. This therefore implies that, "a lack of safety at schools may serve to perpetuate crime and violence in society at large" (Jefthas & Artz, 2007:46). One can therefore argue that schools, teachers, the Department of Education and other government bodies have the potential of playing a vital role in influencing or preventing the rates of violence in South African society.

### Recommendations

Since the results of the above- mentioned survey expressed the important of religion, therefore religions, and Religious Education, must be considered. It should be the responsibility of all stake holders in the community. The government should fund the curriculum and sponsor learners who want to pursue a career. Like any other subjects, especially Mathematics and Science, Religious Education must be funded. The government, through the Department of Education should encourage teachers to have interest on the subject. In order to ensure the success in achieving the intended objective of implementation of Religious Education, this article urge the government, learning institution, faith based organisation and the society to identify persons with good morals. This article recommends that the government should appreciate the role of Religious Education at learning institutions and the community. Faith Based organisations should cease "fighting" on dogmatic and ecclesiastical matter and concentrate on everything that benefit the community.

### Conclusion

The moral decay in the society which is portrayed in rampant fraud, evidence of corruption in high and low places, bribery, stealing and robbery with violence, scandalous nepotism and political patronage and abuse of power, excessive materials and general indiscipline (Iheomia, 1995, p.1) has reduced a smooth running of education and life in general. Such social ills demand long lasting and effective, efficient programme. The ideology of religion fits in the picture. Since the concept of religion is crucial phenomenon in mankind, every aspect related to the subject deserves special attention. Religion is an integral part of various aspects in a person's existence (Joubert & Grobler 2013:2). Human surround themselves with spiritual reference, creating a context in which the

sanctified is called upon to express the significance of major life events such as birth, marriages and weekly religious meetings (Hood et al 2009:1). Religion has an ameliorative effect on a variety of indicators of well-being such as morality(Rothschild et al 2009:914), functional impairment (Musick 1996:221), life satisfaction (Lim & Putnam 2010:914) and depression (Paukert et al 2009:103). Indeed, Religious Education is perceived as one of the means to restore moral and social order in the society.

Effective Religious Education, safety programmes and intervention can address a wide range of issues that reinforce violence within both the school and community, including behaviours attitude, patterns and forms of communication, policies and norms (Burton & Leoschut, 2013, p.5). It enhances awareness and understanding of religions and beliefs, teachings, practices and forms of expression, and of the influence of religion on individuals, families, communities and cultures. Religious Education (RE) encourages learners to learn from different religions, beliefs, values and traditions, while exploring their own beliefs and questions of meaning. RE contributes to pupils' personal development and well-being and to community cohesion by promoting mutual respect and tolerance in a diverse society. RE has an important role in preparing pupils for adult life, employment and lifelong learning. It enables pupils to develop respect for and sensitivity to others, in particular those whose faiths and beliefs are different from their own.

School safety programmes and interventions can address a wide range of issues that reinforce violence within both the school and community, including behaviours, attitude, pattern and forms of communication, policies and norms (Burton & Leoschut, 2013, p.5). Teaching about religion is an educational responsibility in public education, but religious nurture should be provided by the home, family and religious community (Dreyer, 2006, p.41). It is the responsibility of parents, learning institutions, faith based organisations to ensure that Religious Education presented in an informed manner. Religious institutes should not express any opinion at all on such matters. Instead, religious institutions should fulfil a specific prophetic role, which includes the need to act as a watchdog to ensure the concept of justice, love, human rights and human dignity are adequately taken into account and protected in a country's constitutions. Indeed, an effective well-informed Religious Education can curb the social ills at learning institutions and in the society.

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# PARTICIPATORY ENVIRONMENTAL EDUCATION PROGRAMME AND LEARNERS' ATTITUDE TOWARDS THE ENVIRONMENT IN NIGERIA

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## Abstract

One's attitude affects how he relates to other people and to the environment in general and so constitute a major factor in our prospect for achieving a sustainable future. Incidentally, many studies still report poor environmental attitude among Nigerians. This has been attributed to lack of properly articulated Environmental Education programme that targets the very large percentage of Nigerian population outside the formal school system. This study examined the impact of a Participatory Non-formal Learning Programme on adult learners' environmental attitude. One hundred and fifty-four non-formal adult learners in intact classes of JS1 to SS1 from two adult literacy centres in Oyo State were purposively selected for the study. The two adult literacy centres were randomly assigned to experimental and control groups and the study lasted twelve weeks. Four instruments were used for data collection. Three null hypotheses were tested at 0.05 level of significance. Data collected were analyzed using Analysis of Covariance. There was significant effect of treatment on non-formal adult learners' environmental attitude ($F_{(1,153)}$=106.25; $p<0.05$).The participatory non-formal environmental education programme was more effective in developing positive attitudes ($\overline{X}$ = 69.10) than the modified conventional lecture ($\overline{X}$ = 49.24). The participatory non-formal Environmental Education programme is effective in improving adult learners' environmental attitude. It was therefore recommended that the participatory non-formal Environmental Education programme be adopted by the Environmental Educators for teaching adult learners.

**Keywords:** environmental education,, attitude, participatory learning.

## Introduction

Nigerian environment is endowed with rich natural resources. Its land, water, air, plants and animal species, among other benefits constitute a very serene setting for the ecstatic fulfillment of the people. In recent times however there have been widespread reports and real life experiences on the enormous abuse on these valued resources in virtually all parts of the country. There has been the common habits of indiscriminate waste disposal, erection of structures on unapproved areas, poor maintenance of dams, ineffective legislation and laws, unmitigated discharge of industrial pollutants into water bodies, air and land, destruction of plants and animal habitats, urbanization as well as such social vices as religious and political unrest, kidnapping and terrorism.

Consequent upon these practices are incessant flood disasters, erosion menace, oil spills, desert encroachment and their aftermath of homelessness, epidemic outbreak and other health problems, hunger and starvation, loss of lives and properties; experts have warned that the country is gradually being condemned to desolation and barrenness (Uzokwe, 2008). A British geologist, in a more recent remark has also predicted that Nigerians could be hit by major natural disasters like earthquakes and tsunamis if some drastic measures are not urgently adopted (Teseun, 2010).

Related to the above assertion is the recent earth tremor in parts of Benue state and incidences of flood disasters in different parts of the country including Sokoto, Kebbi, Jigawa, Kebbi, Jigawa, Kogi, Lagos, Ogun, Oyo and the Niger Delta region (Stolber, 2008). An earlier report by Nwokeabia (2008), revealed that there is hardly any part of Nigeria where gully erosion does not occur. This

phenomenon leads to loss of lives and farmlands as well as displacement of populations, as people whose houses and other properties cave into the gullies are forced to relocate to other parts of the country. Noticeable examples include Agulu-Nanka in Anambra state where in the past 20 years over 1500 hectares of land have been lost to erosion. Also, Anucha in Imo State, Auchi in Edo State, Bukuru in Plateau State, Ogbomoso in Oyo State among others also have their shares.

Over 50 million out of the estimated 167 million Nigerian population are reported to reside in areas at the risk of soil degradation due to erosion while over 25 million tonnes of the soil is lost to various forms of erosion annually Nwokeabia (2008). Furthermore, coastal erosion has washed away the southern coastline of the country and about 400km of the national coastlines are degraded and lost annually at the rate of 50% by tidal erosion and flood. Deforestation has been estimated to be occurring at 3.5% per annum and that the areas under forest have declined from 14.9million hectares to 10.1million hectares. The report also states that between 350,000 hectares and 400,000 hectares of forest is lost annually to logging, collection of poles, fuel wood, provision of site for agriculture, creation of pasture for livestock, breeding, development of dams for agriculture, urbanization and settlement, creation of right of ways for infrastructures (roads/railway, telecommunication, water/sewer, electricity transmission lines etc). The report further shows that 80% of Nigerians are rural dwellers, and that they depend on cutting of woods for fuel. This has contributed to serious forest resources depletion and environmental degradation. Clearing of land for food production alone accounts for over 80% of total annual deforestation (Nwaokeabia, 2008).

Oyo State is strategically located in the South Western zone of Nigeria. As one of the largest states in the country with a total of thirty three Local Government Areas, its teeming population, high rate of urbanization, poor urban plan, acute shortage of potable water supply, poor disposal and management of solid and liquid wastes, flood disasters and deforestation have plunged it into serious environmental problems (Bamidele, 2011). Its capital city, Ibadan, though the largest in Africa, South of Sahara was once referred to by the United Nations as the dirtiest in the country (Aborode, 2010).

Research findings have revealed poor environmental attitude of Nigerians of varying cadre (Mansaray & Ajiboye, 1997; Olagunju, 1998; Mansaray, Ajiboye & Audu, 1998; Eguabor, 2001; Nzewi, 2001; Ogunleye, 2002). Attitude is noted to be usually influenced by what one values. As such, one's attitude affects how he relates to other people and to the environment in general and so constitutes a major influence on our prospect for achieving a sustainable future., Environmental Education (EE) programmes should therefore aim at improving the quality of the environment and the development of the understanding of the influences which restrict or modify it by heightening aesthetic awareness (attitude). Moreover, the improvement of the environmental attitude of the people tends to be central to the six major categories of objectives of EE as cited in the UNESCO – UNEP International EE Programme (1989).

Though it could be noted that considerable amount of work is currently going on in the formal education sector in Nigeria nothing much seems to be happening in the non-formal sector (Okeke, 2004), that can impact positively on the environmental attitude of Nigerians who are not presently pursuing formal education. Most efforts at non-formal EE tend to begin and end on creating environmental awareness.  Virtually all the discussions, press releases and briefing by high ranking stakeholders on the environment have always emphasized the use of radio and TV jingles, panel discussions, essay writings, documentaries and award presentations (FME, 2000; FEPA, 1995) which are basically non-participatory.  Hardly would anyone emphasize the organized educational activities which are participatory in approach to properly target the improvement of the environmental attitude of the large percentage of the country's population outside the formal school system. Since

those who are outside the formal school system form the larger percentage of the people who degrade the environment most, they need to be at the fore-front in turning the environment around for the better. It becomes imperative therefore that non-formal adult EE programmes which are participatory in approach be properly focused to position the adults for better environmental attitude.

The present study therefore centered on the development and implementation of a participatory Non-Formal EE programme for the adult learners as a way of augmenting the existing non-participatory approaches to Non-Formal EE and also to provide a more innovative approach to effectively impact their environmental attitude which is attainable through active learners' participation in teaching / learning processes.

## Hypothesis

Three hypotheses were tested in this study at .05 level of significance. The hypotheses are:

$HO_1$     There is no significant main effect of Participatory Learning Programme on the Non-formal Adult Learners' Environmental attitude.

$HO_2$     There is no significant main effect of education level on the Non-formal Adult Learners' Environmental attitude,

$HO_3$     There is no significant main effect of gender on the Non-formal Adult Learners' Environmental attitude.

## Methodology

The developed participatory non-formal EE instructional guide is based on the social constructivist instructional theory which posits that knowledge is constructed when individuals engage socially in talk and activity about shared problems or tasks (Wikipedia Foundations, 2008). In this case, the teacher's role shifts from one who imparts knowledge to being a facilitator. Its major proponent includes J.S. Brunner and Jean Piaget. The ultimate aim of the theory is the construction of shared understanding through authentic and meaningful activity. This aim is informed by the following assumptions that learning is constructed by the learner

- learning occurs within and is influenced by context (learning or meaning does not occur in isolation but is influenced by one's social context)
- teaching supports learning construction.

The study adopted the pretest - posttest, control group, quasi experimental design. The participants for the study comprised the non-formal adult learners in the Adult Literacy Centres in Oyo State who were currently undergoing classes equivalent to the Junior (Upper Basic) and Senior Secondary School levels of the formal education system. Two centres were purposively selected and randomly assigned to the experimental and control groups for the purpose of this study. An intact class sample selection was employed such that 79 participants were sampled for the experimental and 75 for the control groups. This summed up to a total of 154 adult learners out of which 72 were drawn from JSS 1 & 2 and represented as Low Education Level, and 82 from JSS3 & SS1 as the High Education Level for the purpose of this study. The participants consisted of the 87 males and 67 female adult learners.

The four instruments used in the study are:

1. Participatory Non-formal Adult EE Programme
2. Instructional Guide for the Participatory Non-formal Adult EE Programme
3. Conventional Lecture Method Guide
4. Environmental Attitude Questionnaire (EAQ)

Data collected were analyzed using Analysis of Covariance (ANCOVA). The Multiple Classification Analysis (MCA) was used to define the magnitude of the mean scores of the various groups.

**Results**

The results of the analysis carried out are presented according to the sequence in which the null hypotheses were tested.

**Hypothesis 1: There is no significant main effect of the participatory Learning Programme on the Non-formal Adult Learners' Environmental Attitude.**

**Table 1:    Summary of ANCOVA of Post-Test Attitude by Treatment, Education   Level and Gender**

| Source of Variance | Hierarchical Method | | | | |
|---|---|---|---|---|---|
| | Sum of Squares | Df | Mean Square | F | Sig. |
| Covariates          PRE-ATTITUDE | 220.247 | 1 | 220.247 | 1.585 | 210 |
| Main Effects        (Combined) | 15215.277 | 3 | 5071.759 | 36.500 | 000 |
| TREATMENT | 14764.280 | 1 | 14764.280 | 106.253 | 000* |
| EDUCATION LEVEL | 42.408 | 1 | | 305 | 581 |
| GENDER | 408.590 | 1 | 42.408 | 2.940 | 089 |
| 2-Way Interactions  (Combined) | 2274.410 | 1 | 408.590 | 5.456 | 001 |
| TREATMENT   x EDUCATION LEVEL | 1893.742 | 1 | 758.137 | 13.629 | 000* |
| TREATMENT   x GENDER | 8.173 | 1 | 1893.742 | 059 | 809 |
| EDUCATION LEVEL   x GENDER | 319.160 | 1 | 8.173 | 2.297 | 132 |
| 3-Way Interaction   TREATMENT   x EDUCATION LEVEL   x GENDER | 133.52 | 1 | 319.160 | 961 | 329 |
| Model | 17843.460 | 8 | 133.526 | 16.502 | 000 |
| Residual | 20148.254 | 145 | 2230.433 | | |
| Total | 37991.714 | 153 | 138.953 | | |
| | | | 248.31 | | |

*Significant at p < 0.05

Findings from the study shows that there is a significant effect of treatment on adult learners' environmental attitude ($F_{(1,153)}$= 106.253; P <0.05). On this basis, hypothesis 1 is rejected. This means that the difference between the environmental attitude score of adult learners exposed to the participatory instructional prograsmme and that of control group is significant.

**Table 2:    Multiple Classification Analysis of Post-Test Attitude by Treatment, Education Level and Gender**

| | | Predicted Mean | | | | | |
|---|---|---|---|---|---|---|---|
| | | Unadjusted | Adjusted for Factors and | Unadjusted | Eta | Adjusted for Factors and | Beta |
| Treatment + Category | N | | | | | | |

| | | | | Covariates | Dev | | Covariates | |
|---|---|---|---|---|---|---|---|---|
| TREATMENT | Participatory Instruction | 79 | 68.99 | 69.10 | 9.56 | .625 | 9.67 | .632 |
| | Control | 75 | 49.36 | 49.24 | -10.07 | | 10.19 | |
| EDUCATION LEVEL | Low | 72 | 58.18 | 58.62 | -1.25 | .74 | -81 | .048 |
| | High | 82 | 60.52 | 60.14 | 1.09 | | .71 | |
| GENDER | Male | 87 | 57.87 | 57.98 | -1.55 | .113 | -1.45 | .105 |
| | Female | 67 | 61.45 | 31 | 2.02 | | 1.88 | |
| R = .637 R Squared = .406 | | | | | | | | |

From table 2 learners exposed to the participatory learning programme obtained higher environmental attitude score (ẍ= 69.10) than their control group counterparts (ẍ= 49.24).

**Hypothesis 2: There is no significant main effect of level of education on the Non-formal Adult Learners' Environmental Attitude.**

From the findings of the study in table 1 there is no significant effect of education level on participants' environmental attitude ($F_{(1,153)}$ = .305; p > .05). Hence hypothesis 2 is not ejected. However those in higher education level obtained higher environmental attitude score
(ẍ= 60.14) than those in lower education (ẍ= 58.62) as shown in table 2.

**Hypothesis 3:   There is no significant main effect of gender on the Non-formal Adult Learners' Environmental: Attitude.**

The result obtained reveals that the effect of gender on participants' environmental attitude is not significant ($F_{(1,153)}$ = 2.940, p > 0.05). Hence Hypothesis 3 is not rejected. The magnitude scores shows that the female learners obtained higher environmental attitude scores (ẍ= 61.31) than their male counterparts (ẍ= 57.98).

**Discussion of findings**
Findings from this study on environmental attitude revealed that the adult learners in the participatory learning group acquired more positive environmental attitude than those in the control group. The superiority of the participatory group's performance over the control group in acquisition of environmental attitude may not be unconnected with the fact that those exposed to the participatory programme engaged in various fun creating activities, team work and group activities which must have instilled in them a great deal of concern for the environment hence the resultant significant positive change in their attitudes towards the environment.

The placement into the small groups which was strictly randomly effected brought the adults of varying learning styles, capabilities, experiences and dispositions to work together to produce a decision that they believed would best represent their groups" work. This involved a lot of cooperation, respect for each other's ideas and views, leadership roles, adherence to laws, rules and regulations governing the activities which must have aided in instilling positive attitude in the learners towards the environment. The active learner participation approach as demonstrated in the present EE programme provided a platform for evaluating the learners on the affective domain and alsoserved as an effective way of taking care of individual differences in the adult learners. The more positive attitude demonstrated by participants in the participatory group than those in the control bears resemblance with the findings of Ajiboye and Ajitoni (2008); Ajiboye and Silo (2008); Olagunju (1998).

Education level and the gender of the participants did not have any significant influence on the adult learners' environmental practices. Though the males performed better than the female the differences were found to be insignificant. This implies that the Non-formal Participatory EE Programme had about an equal effect on both male and female adult learners in the study. This could be attributed to the fact that this EE progamme tend to contain essential elements that could impact positively on both the male and female environmental attitudes. Hence it provided equal learning opportunities to cater for the affective domains of all the adult learners in the study regardless of gender differences.

**Conclusion**

The quality of the environment depends critically on the level of attitude and values systems of human beings in the society. For the obvious reason that those outside the formal school system constitute the larger percentage of the people who degrade the environment most it may be very necessary that current directions in EE should accord priority to educating the adults in the non-formal sector. The high level performance of the adults learners exposed to the Participatory Non-formal EE programme developed and used in the present study is part of the indications that the environmental attitude of such group of people could be more effectively impacted by EE programmes that allow them the freedom to actively participate in democratized teaching/learning settings than in the usual non-participatory, one-directional or teacher directed approaches

**Recommendations**

It is therefore, recommended that in targeting adult learners in EE attention should be paid to their freedom/choice. Based on the findings of this study the following recommendations are made:

Adult learners should be exposed to Participatory Non-formal EE Programmes during which they would be given the opportunity to engage in various fun creating activities, team work, group activities, adherence to laws, rules and regulations governing the activities, decision-making and leadership roles. All of which involve a lot of cooperation, respect for each other's ideas and views and have the tendency of instilling in them a great deal of concern and positive attitude towards the environment.

Adult Educators should be trained in the development and use of Participatory EE Programmes through capacity building workshop series. This is particularly important as the active-learner participation approaches adopted by the present participatory EE programme would also afford them the rare opportunity of evaluating the learners on the affective domain as well served as an effective way of taking care of individual differences in the adult learners.

Curriculum experts in EE and Adult Education should work together to ensure adequate utilization of Participatory EE Programmes for the adults both in the Literacy Centres and other settings such as the workplace, religious organizations, vocational centres, trade unions,

The Government via the Ministry of Environment and other related stake holders should adopt the Participatory Non-formal EE Programmes to urgument the efforts so far made through Non-participatory programmes.

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